EUROPEAN CENTRAL BANK

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FINANCIAL STABILITY REVIEW

DECEMBER 2008

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In 2008 all ECB publications feature a motif taken from the €10 banknote.

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PREFACE

Financial stability can be defined as a condition in which the financial system – comprising of financial intermediaries, markets and market infrastructures – is capable of withstanding shocks and the unravelling of financial imbalances, thereby mitigating the likelihood of disruptions in the financial intermediation process which are severe enough to significantly impair the allocation of savings to profitable investment opportunities. Understood this way, the safeguarding of financial stability requires identifying the main sources of risk and vulnerability such as inefficiencies in the allocation of financial resources from savers to investors and the mis-pricing or mismanagement of financial risks. This identification of risks and vulnerabilities is necessary because the monitoring of financial stability must be forward looking: inefficiencies in the allocation of capital or shortcomings in the pricing and management of risk can, if they lay the foundations for vulnerabilities, compromise future financial system stability and therefore economic stability. This Review assesses the stability of the euro area financial system both with regard to the role it plays in facilitating economic processes, and to its ability to prevent adverse shocks from having inordinately disruptive impacts.

The purpose of publishing this review is to promote awareness in the financial industry and among the public at large of issues that are relevant for safeguarding the stability of the euro area financial system. By providing an overview of sources of risk and vulnerability for financial stability, the review also seeks to play a role in preventing financial crises.

The analysis contained in this review was prepared with the close involvement of, and contribution by, the Banking Supervision Committee (BSC). The BSC is a forum for cooperation among the national central banks and supervisory authorities of the European Union (EU) and the European Central Bank (ECB).

I OVERVIEW

Stresses on mature-economy financial systems persisted over the summer months of 2008 as banks had to absorb further asset valuation write-downs in an environment where wholesale funding costs remained elevated. At the same time, uncertainty about the global economic outlook grew, with the balance of risks to economic activity increasingly skewing to the downside, risk aversion among financial market participants surged and the prices of most financial assets fell. The persistent liquidity stresses encountered in the early phases of the turmoil eventually gave way to deeper concerns about creditworthiness and the adequacy of capital buffers. In this environment, there was a further loss of confidence among investors and creditors about the ability of some financial firms to meet their obligations following the bankruptcy of a major investment bank. This left many key financial firms facing mounting challenges in accessing short-term funding and capital markets, which triggered sharp drops in their stock prices. Some of the world's largest financial institutions were affected by this adverse dynamic and a number of them were ultimately declared bankrupt, purchased by other financial institutions or provided with government support. That said, the extraordinary remedial actions taken by central banks and governments, with a view to addressing liquidity stresses and strengthening capital positions, should contribute to restoring confidence in and improving the resilience of financial systems. Moreover, over time, the measures should contribute to lowering funding costs and facilitating the flow of credit to the economy.

The next part of this section reviews the vulnerabilities and events that triggered the recent intensification of financial system stresses and the remedial measures that have been taken to stabilise the euro area financial system. This is followed by an examination of the sources of risk and vulnerability that will be key in shaping the outlook for euro area financial system stability. The risks and vulnerabilities in the macro-financial environment are discussed first, and this is followed by a discussion of those that are particular to the financial system. The section concludes with an overall assessment of the euro area financial stability outlook.

SOURCES OF RECENT STRESS IN THE FINANCIAL SYSTEM AND REMEDIAL ACTIONS THAT HAVE BEEN TAKEN

Although some large euro area banks were hard-hit by valuation write-downs on structured credit securities and related market stresses, which had persisted for more than a year, they seemed to be broadly resilient to adverse disturbances until September 2008. A key explanation for their apparently adequate shock-absorbing capacities was the strength of their profitability performances just before the turmoil erupted in August 2007, the continued growth of their lending throughout much of 2008 and the fact that they generally had solvency positions well above the regulatory minima. In the first half of 2007, euro area large and complex banking groups (LCBGs) posted a median return on equity (ROE) of just over 20%, and the strength of their profitability was broad-based. At the same time, the median of their overall solvency ratios stood at 11%.

Given the initial strength of profitability, the bulk of the asset valuation write-downs – which totalled around €73.2 billion for the euro area LCBGs by end- November 2008 – could mostly be taken through their profit and loss accounts. Nevertheless, the impact on the profitability of these institutions was sizeable: their median ROE for the full year 2007 fell to about 15%, and that for the first half of 2008 dropped to about 11% while the indications are that there was a further sharp drop in profitability in the third quarter.

What is important is that the losses endured by euro area LCBGs were rather widely diffused across a large number of institutions that had previously been highly profitable, with only a handful reporting losses that were so large that injections of fresh capital were required. In general, the financial consequences of the market turmoil tended to be most pronounced

for institutions with sizeable investment banking and trading activities. While the capital positions of euro area LCBGs did deteriorate in the second half of 2007, capital-raising and a reduction in risk-weighted assets actually left their solvency ratios higher, on average, at the end of the first half of 2008 than at the end of 2007, and even higher in comparison with the situation at the end of the first half of 2007. Moreover, the indications are that there was a further rise in capital ratios in the third quarter of 2008.

A defining feature of the financial turbulence that erupted in August 2007 and continued throughout 2008 was the protracted adverse impact it had on the funding positions of, and risks confronting, euro area LCBGs. Financing became more expensive and difficult to access across practically all sources, thereby adding to pressures on these institutions to reduce the size of their balance sheets. At the same time, several institutions had to extend liquidity support to their off-balance-sheet vehicles or re-intermediate assets onto their balance sheets. While customer deposits continue to represent the most important source of funding for euro area LCBGs, the share of wholesale funding has grown significantly in a number of institutions over recent years. In the presence of deposit insurance for most retail deposits, funding structures that rely extensively on wholesale debt instruments carry greater funding liquidity risks than those that are more balanced.

Notwithstanding some periods of reduced stress, the functioning of unsecured interbank money markets has been more or less persistently impaired since the start of the market turmoil in early August 2007. Between early May and early September 2008, money market spreads in the euro area fell across all maturities up to three months. The creation of a number of new central bank facilities and the demonstrated willingness of central banks to provide necessary liquidity appeared to alleviate concerns among banks about the availability of short-term liquidity. However, money market spreads increased at maturities longer than three months, suggesting growing counterparty credit risk concerns. It is also noteworthy that the spreads between deposit rates and overnight interest rate swap (OIS) rates – a commonly used metric of the risk premium in unsecured interbank money markets – were influenced by strong demand by European banks for US dollar liquidity. This was because funds borrowed in euro had to be swapped for US dollars to support euro area banks' investment positions that were denominated in this currency. Such cross-currency activity and the high correlation between changes in equivalent spreads of other major currencies indicate that global money markets have become increasingly intertwined as a result of the market turmoil.

By early September, liquidity conditions seemed to have improved for the shortest maturities. However, liquidity remained in short supply for maturities beyond one month. The ECB provided ample liquidity in its regular weekly operations, allowing banks to frontload their reserve requirements during maintenance periods. In addition, the ECB renewed its supplementary longer-term refinancing operations for maturities of three and six months.

In mid-September, conditions in major money markets around the world took a turn for the worse, as the default of Lehman Brothers, a US investment bank, fuelled concerns about the scale and location of counterparty losses, and challenged a widely held view that any large bank that was thought to be too large or too interconnected to fail would be supported by the public authorities. This triggered a sharp increase in deposit-OIS spreads across all maturities as anxieties about the creditworthiness of counterparties rose and uncertainty about own liquidity positions prompted banks to hoard liquidity. Money market funds also hoarded liquidity as a precaution against higher redemption risk. As a consequence, liquidity became very scarce at maturities beyond one week.

Fears of further defaults in the financial sector, fed by persistent market rumours, resulted in

some banks struggling to obtain funds even at rates considerably above the EONIA. In this environment, banks were forced to make more frequent recourse to the ECB marginal lending facility. At the same time, amounts placed on the deposit facility rose significantly, implying significant impairment of the redistribution of interbank liquidity. In order to alleviate liquidity pressures in the euro area money market, the ECB continued to provide ample liquidity through its main refinancing operations (MROs) and responded to liquidity strains with more frequent fine-tuning operations.

After the failure of Lehman Brothers, many euro area banks became subject to the risk of being hit by a loss of confidence in, and speculation about, their liquidity or solvency positions, especially those that were reliant on wholesale funding. In late September, two LCBGs with large cross-border activities in the Benelux countries and France came under intense market pressure because of perceptions of weak asset quality or of liquidity and capital shortages. In Germany, too, a major commercial-property lender had to be saved from the brink of collapse, after its Irish subsidiary ran into short-term funding problems. Self-perpetuating dynamics became important drivers of market developments as leveraged investors were forced to unwind loss-making positions. This led to substantial declines in the stock prices of both global and euro area LCBGs. Collectively, the market capitalisation of euro area LCBGs dropped by almost €200 billion between the middle of September and late November, bringing the cumulative decline since the turmoil erupted to around €450 billion, which is more than half of the aggregate market value of these banks prevailing immediately prior to August 2007. At the same time, credit default swap (CDS) spreads for these institutions surged as counterparty credit risk concerns rose.

By the end of September, conditions in the euro area unsecured interbank money market had become extremely tense. Banks were increasingly dependent on ECB liquidity operations and overnight borrowing, as interbank lending at longer maturities had ceased almost completely. Faced with this impairment of market functioning, the ECB decided on 8 October to conduct its MROs through fixed rate tender procedures with full allotment and to reduce the width of the corridor between the interest rates on its standing facilities from 200 basis points to 100 basis points for as long as this was deemed necessary. On the same day, there was a coordinated 50 basis point interest rate cut – involving the US Federal Reserve, the Bank of England, the Bank of Canada, the Swiss National Bank and Sveriges Riksbank. On 15 October the ECB announced additional measures to further expand the list of assets eligible for use as collateral in its credit operations and to enhance the provision of longer-term liquidity by fully meeting banks' demand for liquidity at maturities of three and six months. In addition, on 6 November, the ECB lowered its policy rate by a further 50 basis points. All of these measures helped to ease the tensions in the euro area money market, although the recovery by late November was still only modest.

Swift and coordinated policy actions by the national governments of the euro area also helped to stabilise the situation. At the euro area level, the Heads of State or Government agreed on a framework and an action plan to support banks on 12 October. This plan involved extraordinary measures that included a strengthening of deposit guarantee schemes, offering government guarantees for bank debt issuance and providing additional capital resources to relevant banks. This framework was fully endorsed by the European Council at its meeting on 15 and 16 October. National governments have since announced their specific plans. In line with the framework, around €2.0 trillion has thus far been pledged by governments in the euro area to guarantee banks' new debt issuance, support their recapitalisation or purchase their assets. Also, the US and UK governments have committed to make available to their banks up to USD 2.5 trillion (for guarantees of newly issued debt, purchases of troubled assets and for capital injections) and GBP 300 billion (for recapitalisation and guarantees of unsecured

bank funding) respectively. In the euro area, the initial market response to the announcement of these measures was positive: the CDS spreads of LCBGs declined significantly, and their stock prices stabilised.

SOURCES OF RISK AND VULNERABILITY IN THE MACRO-FINANCIAL ENVIRONMENT

Declines in US home prices were an important triggering factor behind the market turmoil which has persistently affected many mature economy financial systems since August 2007. Across the mortgage markets, the main segments affected in the early stages of the turmoil were the sub-prime and other non-conforming mortgage markets, while the conforming market remained relatively untouched. Thereafter, the deterioration in the credit quality of mortgages began to spread to the conforming segment, triggering concerns about the financial soundness of the two largest US mortgage corporations – the government-sponsored enterprises (GSEs) known as Fannie Mae and Freddie Mac – which eventually led to their being bailed-out in early September. Due to the prompt action taken by the US authorities, the potential direct impact of the GSE crisis on the US household sector remained relatively contained.

Looking ahead, according to futures prices, it does not appear likely that US home prices will bottom-out before the end of 2009: the price declines endured so far may only represent around half of the expected total fall. Moreover, there are downside risks to the outlook for the US housing market on both the demand side and the supply side. Risks related to demand for housing concern the price and availability of mortgages and the general weakening of US economic activity, employment growth and labour incomes. As regards the supply side, further increases in foreclosure rates would add to the overhang of unsold homes, which has already reached the highest level recorded in decades. That said, it is important to recognise that the affected mortgage-related securities have already priced-in a rather severe scenario for house prices, and financial firms have meanwhile taken account of much of the implied losses in their balance sheets and profit and loss accounts.

As regards euro area housing markets, indications are that the deceleration in property price inflation, which characterised 2007, continued in 2008 in most euro area countries, with prices even falling in some countries. Moreover, the risks remain tilted towards the downside as property price valuation measures based on house price-to-rent ratios continued to provide indications of overvaluation in the residential property markets of a number of countries. This calls for close monitoring because the risks to euro area financial stability posed by the household sector, although contained, have increased over the past six months. On the positive side, the deceleration in the growth of loans to the household sector, which started well before the turmoil, and in house price inflation has contributed to a moderation of the risks. However, a less favourable outlook for the labour market and for households' disposable income points to a possible emergence of risk in the ability of households to service their debts.

Turning to the condition of euro area firms' balance sheets, these have continued to show resilience to a challenging operating environment. The assessment is that the balance sheets of euro area firms are generally in a better condition than they were at the time just before the last credit cycle downturn. Looking ahead, however, the balance of risks appears to be tilted towards some deterioration in the condition of non-financial firms' balance sheets in the near term. The euro area corporate sectors' profitability growth is likely to continue to slow down after the exceptionally strong profitability performance in recent years, and leverage ratios are high among euro area corporations. In addition, should the reductions in short-term interest rates not be passed on to bank lending rates, the increase in lending rates since mid-2007, together with tighter bank lending standards, is likely to contribute to a more difficult funding situation for the corporate sector. With a fat tail of highly leveraged firms

that have very low profitability and are expected to face much higher refinancing costs than before, rating agencies are expecting a surge of defaults by euro area speculative-grade firms in the near-term.

A further source of risk in the macro-financial environment continues to be the deteriorating conditions on, and outlook for, commercial property markets, both globally and in several euro area countries. Stabilising or, in some cases, falling commercial property prices and higher funding costs have diminished investor demand, and this is likely to continue. Furthermore, the deteriorating economic outlook for the euro area has negatively affected demand for rented commercial property and is likely to reduce demand further.

SOURCES OF RISK AND VULNERABILITY IN THE EURO AREA FINANCIAL SYSTEM

The prospects for LCBG profitability returning to pre-turmoil levels do not look very promising in the short term. Although the flow of write-downs triggered by the decline in the valuation of sub-prime mortgage-related securities can be expected to taper off, the impact on LCBGs' financial statements of significant declines in the value of other structured finance products – including US consumer asset-backed securities (ABSs) and euro area residential mortgage-backed securities (RMBSs) – after August remains to be seen. In addition, the pressure on banks to deleverage is becoming acute on account of the high funding costs they face in wholesale markets, the difficulties that they have been encountering in issuing debt, and indications that investors are requiring them to enlarge their capital buffers. Perhaps the clearest sign of this can be found in the sharp reduction of the growth of banks' risk-weighted assets. Banks have been responding by tightening their lending standards, and they have been quick to cut costs. Pressure on revenues is also rising as a result of slower growth in lending to both households and firms against the background of weaker economic activity. In addition, given much shallower financial market liquidity and a virtual standstill in securitisation activities, fees and commissions from asset management activities, as well as trading incomes, are likely to remain very subdued for some time to come.

Given this environment and notwithstanding government measures relating to funding guarantees and the injection of capital, the uncertainty surrounding the outlook for the banking sector remains high and has increased since the finalisation of the June 2008 FSR. This is due to the fact that, apart from the fall-out on euro area banks as a result of the continued weakness in the US housing market, credit risks in the euro area have also risen as a result of weakening housing markets in some countries and growing risks of a turn of the global corporate sector credit cycle. In this vein, there is concern that the longer bank funding costs remain high and the more that banks respond to this by deleveraging or passing on the costs to borrowers, the greater becomes the risk of an adverse feed-back loop which would spark a more traditional credit-cycle downturn – involving a further round of market and credit losses on higher-quality assets for a banking system whose shock-absorption capacity has already been somewhat impaired. Such concerns have been reflected in the renewed widening of the CDS spreads of all euro area LCBGs after May 2008. The measures that have been taken to restore confidence in and improve the resilience of financial systems have contributed to stabilising the banking system, by addressing liquidity needs and strengthening capital positions. Over time, they should contribute to lowering funding costs and facilitating the flow of credit to the economy. However, much will depend on how banks respond to these measures and the challenging environment that lies ahead. This will require an appropriate adjustment of their balance sheets and improvements in the management of their funding risks.

As regards the outlook for the euro area insurance sector, it too has deteriorated since the finalisation of the June 2008 FSR. In particular, the financial market turbulence and spill-overs to the real economy have posed further challenges

for many insurance firms. In addition, insurers that offer banking services or insurers that are part of financial conglomerates continue to be affected by the challenges that are confronting the banking sector.

An important source of risk for euro area financial markets in the period ahead is connected with the return performance of hedge funds. While the hedge fund sector is known to have deleveraged considerably since the eruption of the market turmoil, thereby lowering its vulnerability to margin calls or unexpected cuts in bank credit lines, the vulnerability of funds to the risk of investor redemptions appears to have grown. This is because such redemptions tend to be sensitive to hedge fund return performance, and the market turbulence associated with stresses in the global banking system, as well as short-selling restrictions, had a particularly adverse impact on hedge funds' investment returns in both September and October. Many hedge funds were affected by these events and this contributed to a vicious downward spiral of falling asset prices and forced sales. Looking ahead, if hedge funds increasingly fail to retain their investors, the possibility of further sizeable position unwinds by the sector may pose a challenge to financial markets.

Finally, as long as financial market volatility remains at exceptionally high levels and market liquidity remains thin, it cannot be excluded that unexpected market events could trigger a further unwinding of positions in some markets. In particular, the global CDS markets, where volumes have surged over the past decade and where euro area LCBGs have taken large positions to hedge their credit risk exposures, have not yet been tested by a scenario of simultaneous multiple defaults in the corporate sector. This risk is likely to rise with a deterioration of the corporate credit cycle.

OVERALL ASSESSMENT OF THE EURO AREA FINANCIAL STABILITY OUTLOOK

The euro area financial system has undergone a further significant test of its shock-absorption capacity since the finalisation of the June 2008 FSR. Moreover, there are a number of risks and vulnerabilities ahead that the financial system may have to cope with. These include the possibility of a further deterioration of the US and euro area housing markets, the risk of a deeper and more prolonged slowdown in economic activity, which could exacerbate the credit cycle, and financial market risks related to hedge funds. Hence, the financial stability outlook remains uncertain, not least because of concerns that the longer bank funding costs remain high and the more banks respond to this by deleveraging or passing on the costs to borrowers, the greater will become the risk of an adverse feed-back loop that could spark a more traditional credit-cycle downturn.

The extraordinary remedial actions taken by central banks and governments with a view to addressing liquidity stresses and strengthening capital positions, thereby contributing to restoring confidence in and improving the resilience of financial systems, were successful in stabilising the euro area banking system. The measures also helped to stabilise LCBG stock prices and should mitigate counterparty credit risks from trading in unsecured interbank money markets. Over time, these measures should improve the functioning of the term money markets and the access of banks to wholesale funding markets, thus lowering the cost of bank credit and facilitating its provision to the economy. That said, in order to revive the process of efficient financial intermediation, financial institutions will need to play their part in the adjustment process by taking advantage of these measures to effectively recapitalise and repair their balance sheets. Hence, there is no room for complacency: banks will need to be especially vigilant in ensuring that they have adequate capital and liquidity buffers to cushion the risks that lie ahead.

II THE MACRO-FINANCIAL ENVIRONMENT

1 THE EXTERNAL ENVIRONMENT

The risks to euro area financial stability that stem from the external environment increased markedly after the finalisation of the June 2008 Financial Stability Review (FSR). Global financial stability risks rose on account of a decoupling of global capital flows from trade imbalances, a further deterioration of conditions not only in the US corporate and household sectors, but to some extent also in other parts of the world, an intensification of stresses in financial markets and individual institutions, as well as rising pressure on global macroeconomic fundamentals. Looking ahead, further tensions in the global markets for structured credit, equity and debt cannot be ruled out, which, if they were to crystallise, could have a further adverse effect on the financial soundness of global financial institutions. This also poses risks for global credit conditions.

1.1 RISKS AND FINANCIAL IMBALANCES IN THE EXTERNAL ENVIRONMENT

GLOBAL FINANCIAL IMBALANCES

After the finalisation of the June 2008 FSR, risks related to imbalances in the global financial system increased, with some observers arguing that the global financial turmoil has links with the past build-up of imbalances, in particular to the rising indebtedness of deficit economies.

Despite the partial easing in oil and commodity prices since mid-July, the oil trade balances of net importers of oil worsened substantially. The narrowing of the US trade and current account deficits observed since late 2006 stalled in the first half of 2008. However, by the end of 2008, the US current account deficit is projected to improve somewhat, while the euro area current account balance is projected to turn to deficit and current account deficits of emerging economies in Europe are expected to increase further.

As a counterpart to the worsening of the current account balances of these economies, the surpluses of oil exporters are projected to increase significantly, to in excess of a quarter of 2008 GDP in the Middle East, given limited domestic absorption capacities. In the other main surplus economies, developments do not point to significant improvement either. China's current account surplus is expected to remain close to 10% of GDP, despite slower export growth. Japan's external surplus is projected to decline by close to a full percentage point of GDP, although remaining high at 4.0% of GDP (see Table 1.1).

Table 1.1 Current account balances for selected countries

(2006 – 2009; percentage of GDP)

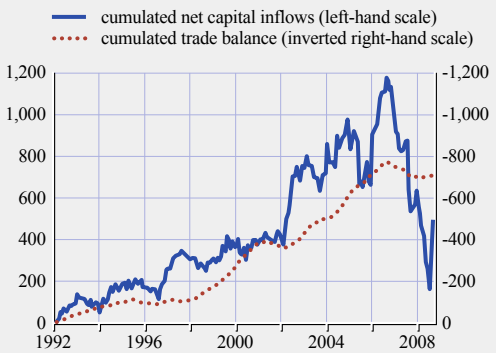
	2006	2007	2008(p)	2009(p)
Industrial economies	**-1.3**	**-0.9**	**-1.0**	**-0.6**
United States	-6.0	-5.3	-4.6	-3.3
Euro area	0.3	0.2	-0.5	-0.4
Japan	3.9	4.8	4.0	3.7
United Kingdom	-3.4	-3.8	-3.6	-3.4
Canada	1.4	0.9	0.9	0.0
Australia	-5.3	-6.2	-4.9	-4.3
Emerging Asia	**5.8**	**6.8**	**5.2**	**5.0**
China	9.4	11.3	9.5	9.2
Middle East oil exporters	**24.1**	**20.2**	**25.1**	**18.6**
Emerging Europe	**-6.0**	**-6.6**	**-7.1**	**-7.2**
Latin America	**1.5**	**0.4**	**-0.8**	**-1.6**

Source: IMF World Economic Outlook (October 2008 projections).

The environment of persistently large US current account deficits and the continued recycling of surpluses from emerging Asia and oil-exporting countries continue to pose

Chart 1.1 US trade balance and net capital inflows to the United States

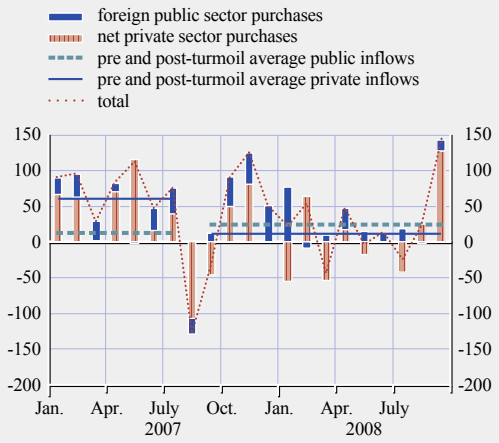
(Jan. 1992 – Sep. 2008; USD billions, 12-month moving sums)



Sources: US Bureau of Economic Analysis and US Treasury International Capital System.

Chart 1.2 Decomposition of net capital flows to the United States

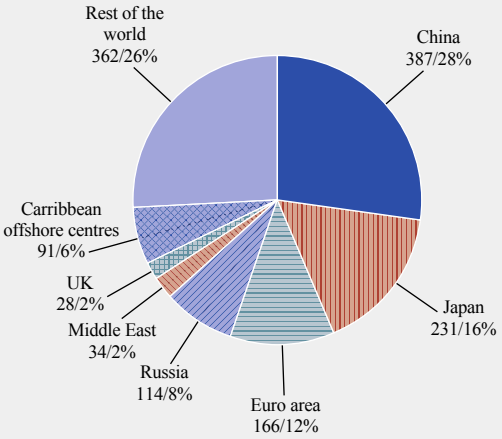
(Jan. 2007 – Sep. 2008; USD billions)



Source: US Treasury International Capital System.
Note: The "pre-turmoil average" is based on the period from January 2005 until July 2007, while the "post-turmoil" average uses information from August 2007 onwards.

Chart 1.3 Foreign holders of US government agency bonds

(June 2007; USD billions and percentage of total foreign holdings)



Source: US Department of the Treasury.

substantial risks to financial stability. Disorderly developments could weigh on the ability of financial institutions to rebuild capital. A lower appetite for risk and the unwinding of carry trades may also make it increasingly difficult for countries to finance external deficits. In fact, despite a strong rebound in September, the US trade deficit has not been fully covered by net portfolio investment inflows to the United States since mid 2007 (see Chart 1.1).

In particular, private investors' capital inflows to the United States remained, on average, below the levels prevailing prior to the outbreak of the current financial market turmoil until they rebounded in September (see Chart 1.2).

A risk that became increasingly apparent after the finalisation of the last FSR was related to the stability of the capital inflows originating from the recycling of large current account surpluses in emerging Asia and oil-exporting countries. The most recently available data for June 2007 suggested that China and Russia rank among the largest foreign holders of US government agency bonds (see Chart 1.3).

Looking ahead in the context of the current turmoil, the persistence of wide global imbalances has magnified the risks related to the stability of global capital flows. If the flow of foreign private financing remains weak, it could severely destabilise global financial markets, possibly involving sell-offs of US dollar assets and increases in US interest rates. If this were to materialise, it would most likely contribute to a deterioration of economic activity in the United States and throughout the world.

US SECTOR BALANCES

Public sector

The Congressional Budget Office (CBO) estimates that the US federal budget deficit increased from 1.2% of GDP in the 2007 fiscal year to 2.9% in 2008. In addition, the federal deficit is expected to increase further over the next two years. Both the US budget deficit and federal debt are likely to increase substantially as a result of the bail-out of some government-sponsored enterprises (GSEs),[1] the insurer

1 See Section 1.3 for details of the plans.

American International Group (AIG), and commitments made under the Troubled Asset Relief Program (TARP),[2] which has a total volume of USD 700 billion (equalling approximately 5% of GDP) and aims to ease the problems of the banking sector in a more comprehensive manner.

Although the final cost of the publicly financed US bail-outs of financial institutions is uncertain, a significant rise in US government debt could have major implications for global financial stability via, for example, its impact on global bond yields and spreads. An adverse scenario could result if the credit ratings for US sovereign bonds were downgraded in connection with the rising costs of the rescue plans. If this were to crystallise, it could increase risk aversion in global financial markets still further, thereby raising risk premia in government bond yields.

Corporate sector

Since the June 2008 FSR, the outlook for the US corporate sector has, on balance, weakened substantially. By mid-September, there were indications that corporate profit growth and default rates had already shown a relatively rapid deterioration, and the broader global outlook had become more subdued. In the wake of the further exacerbation of the financial crisis, the macroeconomic outlook was revised down further, as financial conditions tightened significantly.

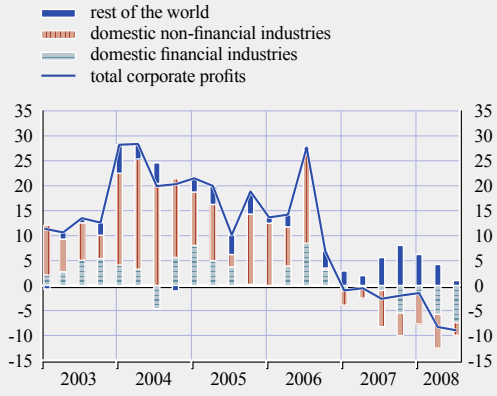
Regarding US corporate sector profit growth, the contribution from the rest of the world has remained the only positive component since the first quarter of 2007 (see Chart 1.4). It is likely, however, that the slowdown of the global economy will start to curb this contribution as well, while the heightened stresses experienced by financial corporations, along with the impact of declining demand across several non-financial corporate sectors, could, at the same time, continue to depress domestic corporate profits.

In line with the corporate profit outlook, the financial condition of US non-financial corporations has weakened since the June 2008 FSR. Corporate sector default rates increased rapidly in the first half of 2008, although they still remained well below the peaks recorded in previous recessions in 2001 and 1990-91 (see Chart 1.5). Where commercial mortgages

2 See Section 1.2 for details of the programme.

Chart 1.4 US corporate sector profits

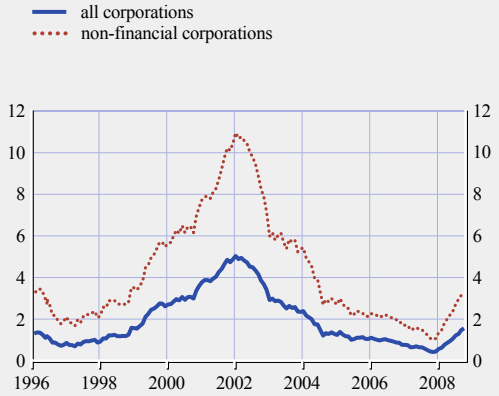
(Q1 2003 – Q3 2008; percentage point contribution to year-on-year growth; seasonally adjusted)



Source: US Bureau of Economic Analysis.
Note: Corporate profits include inventory valuation and capital consumption adjustments. Profits from the rest of the world (RoW) are receipts from the RoW less payments to the RoW.

Chart 1.5 US corporate sector default rates

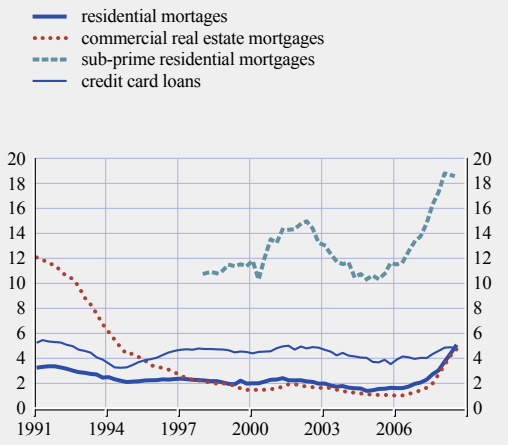
(Jan. 1996 – Oct. 2008; percentage; 12-month moving average)



Source: Moody's.

Chart 1.6 Delinquency rates of loans extended by US commercial banks

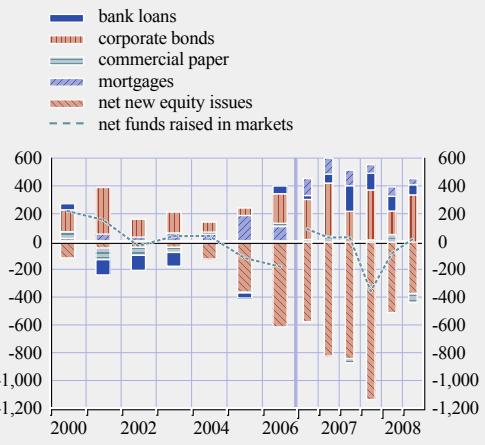
(Q1 1991 – Q3 2008; percentage)



Sources: Federal Reserve and Mortgage Bankers Association (MBA).

Chart 1.7 US non-financial corporate sector: net funds raised in markets

(2000 – Q2 2008; USD billions)



Source: Federal Reserve Board of Governors.

are concerned, delinquency and charge-off rates are now above their 2001 levels (see Chart 1.6).

The reliance of US corporates on external financing has increased further since the June 2008 FSR. It had reached 1.8% of GDP in 2007, but remained more or less unchanged in the first half of 2008. The sources of that external financing were corporate sector bond issuance, bank loans, and mortgages, which still increased relatively briskly in the first half of 2008, and counterbalanced the negative net issuance of equities and commercial paper (see Chart 1.7). As from mid-September, however, conditions on the commercial paper markets became more difficult, at a time when corporate bond spreads were rising rapidly. This made both liquidity management and longer-term debt issuance more difficult and expensive, given that banks had at the same time tightened their lending conditions further.

Overall, although the US non-financial corporate sector was able to cope relatively well with the weakening economic growth momentum and the persistence of the financial turbulence up to mid-September 2008, the dramatically increased pressures thereafter, both on the price and on the availability of external financing – even for short-term funding purposes – and the further downward revisions made to the global economic outlook have weighed substantially on the US business outlook. In view of the sharp deterioration of US corporate sector ratings in the first half of 2008 (see Chart S4) and the forecast increases in defaults on speculative-grade corporate bonds (see Chart S3), the latest developments on the financial markets further underline the conclusion that the credit cycle for US non-financial corporations has turned.

Household sector

Since the finalisation of the June 2008 FSR, US household sector balance sheet conditions have worsened, although the fiscal stimulus package adopted by the US government did underpin private consumption, and thus helped to prevent a technical recession in the United States in the first half of the year. The package was able only to delay the decline in personal consumption, however, and data releases from late summer onwards have pointed to rapidly decreasing household consumption. The change in financial conditions since mid-September has aggravated the downturn further.

The decline in US households' total net wealth accelerated in the first half of 2008, driven by

the sharper decrease in the value of both real and financial assets, although total liabilities grew markedly slower than disposable incomes. The continued decline both in house prices and in owners' equity as a percentage of residential real estate has underpinned increased delinquency and foreclosure rates (see Chart 1.6 and also Box 1 for details). The increased delinquency rates of sub-prime mortgages have recently spread to the rest of the consumer credit market, with delinquency rates rising on conforming mortgages, commercial mortgages and consumer credit.

Looking at the US mortgage markets as a whole, the main segments affected in the initial stages of the current financial turmoil were the sub-prime and other non-conforming mortgage markets, while the conforming mortgage market remained relatively untouched.[3] As a result, the share of GSE-insured conforming mortgages in the total mortgage supply increased sharply from below 10% during the housing boom in 2004-06 to well over 75% in the first half of 2008, while the share of mortgage loans from MFIs was halved and the share of mortgages from private issuers of asset-backed securities (ABSs) has turned negative (see Chart 1.8).

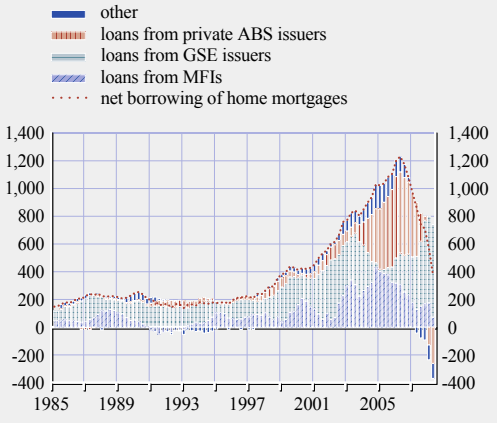
Thereafter, the turmoil spread to the wider economy and led to extensive write-downs, also on conforming mortgages, and to increased concern about the financial soundness of the GSEs, which eventually led to their bail-out.[4] Due to the prompt action taken by the US authorities, the direct impact of the GSE crisis on households remained relatively contained. However, the non-conforming mortgage markets are expected to remain almost non-existent, at least until house prices start to stabilise (see Box 1).

Where other types of credit are concerned, the growth of consumer credit remained brisk in the first half of 2008 (averaging around 5% per annum), but the data releases thereafter pointed to a sharp downturn in the trend. In addition, respondents to the recent Senior Loan Officer Surveys reported both a major tightening in the standards for lending to consumers and a sharp decline in demand for such credit. The intensification of stresses in the financial markets since mid-September have curtailed the availability of credit further, and have increased its price.

Looking forward, it is likely that delinquency and foreclosure rates on US mortgages will continue to increase; housing markets are not expected to show stronger signs of stabilisation before 2010, while GDP growth and household consumption have slowed, and even turned negative. At the same time, unemployment has risen rapidly. Therefore, it seems likely that pressure on the global financial system emanating from the US housing markets will continue in the near future.

Chart 1.8 US mortgage supply

(Q1 1985 – Q2 2008; USD billions)



Source: Federal Reserve.
Notes: Private ABS issuers refers to mortgages held by issuers of asset backed-securities, GSEs to mortgages held by GSEs and by federally related mortgage pools, and MFIs to loans held by Commercial banks, Saving institutions, and Credit unions.

3 The mortgages accepted by the government-sponsored enterprises (GSEs) are classified as "conforming", whereas mortgages that are either too large ("Jumbo") or involve a debtor with an inadequate track record ("sub-prime") are defined as "non-conforming".

4 See Section 1.3 for details.

Box 1

THE US HOUSE PRICE OUTLOOK

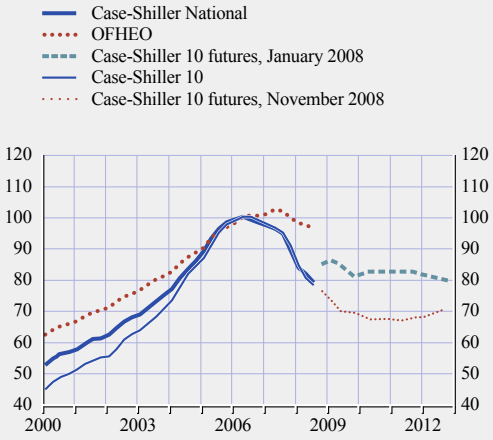
In the United States, house prices peaked in mid-2006 (see Chart A). According to the price indices cited most often, namely the national Case-Shiller index (C-S National) and OFHEO purchases only index (OFHEO), prices in the third quarter of 2008 were 21% and 6.5% respectively below their peaks. Market expectations in late November 2008 – as measured by the Case-Shiller 10 (C-S 10) futures price index for 10 major US cities – indicate that house prices will bottom out in 2010 (see Chart A). This is about six months later than had been expected at the beginning of 2008 and by November prices were expected to fall to more than 15 percentage points below the expectations formed in the early part of the year. In terms of the C-S 10, this implies that house prices will be more than 30% below the peak recorded in mid-2006 before they start to stabilise. If the historical relationships between these indices hold, the C-S National and OFHEO could experience further price declines of around 10% and 5% respectively. It should be noted, however, that these futures price-based projections are surrounded by high uncertainty because the longer-horizon C-S 10 futures markets are highly illiquid.

The developments in average US house prices mask heterogeneity across US states and cities. Recently, the largest year-on-year price declines have been recorded in coastal states, especially in California and Florida, where house prices had increased more than average during the last boom. At the city level, the decline in house prices in the third quarter of 2008 was smallest in Dallas (-2.7%, year on year), while the largest year-on-year drops were in Phoenix (-31.9%), Las Vegas (-31.3) and San Francisco (-29.5). By the third quarter of 2008, the cumulative house price decline from the peaks in these three cities was 38.5%, 37.6% and 33.4% respectively.

To assess the price path implied by the C-S 10 futures, the forecasts of house prices can be compared with rents and the supply-demand situation in the market. Regarding the relative prices,

Chart A US house price outlook

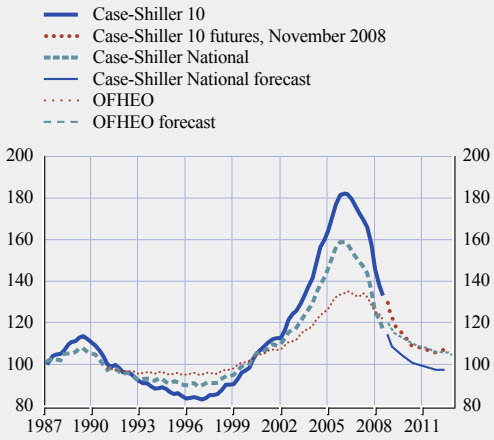
(index: Q2 2006 = 100; nominal prices)



Sources: S&P/Case-Shiller, OFHEO, US Bureau of Labour Statistics and ECB calculations.

Chart B US house price-to-rent ratio and its outlook

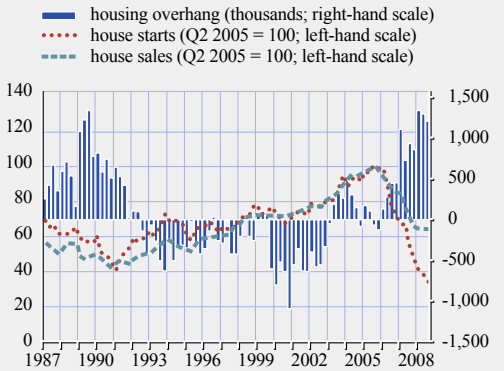
(index: 1987 to 2003 average = 100)



Sources: S&P/Case-Shiller, OFHEO, Census, Bureau of Labour Statistics and ECB calculations.
Note: The forecasts for OFHEO and Case-Shiller National indices are constructed using Case-Shiller 10 futures.

Chart B shows the historical relationship between house prices and rents.[1] In theory, in the absence of any major and lasting shocks, this relationship should revert to some long-run equilibrium, since people should move into rented housing when relative house prices become too high in comparison with rents, and vice versa. According to the house price-to-rent ratio, US house prices may still have been overvalued by as much as 16% to 33% in the third quarter of 2008. If prices decline in the way markets expect, this ratio would revert to around historical averages in 2010. A similar assessment of real price levels can be made based on the price/income ratio. In comparison with median family income, both national house price indices were approximately 20% above the respective longer-term average in the third quarter of 2008.

Chart C Supply and demand in the US housing markets



Sources: Census Bureau, National Association of Realtors and ECB calculations.

The relationship between supply and demand for housing, on the one hand, and house prices, on the other, can be shown with indicators of single-family housing starts, total single-family house sales and a measure of the housing overhang, defined as a residual of a regression of the stock of vacant homes on the population and a constant factor (see Chart C). When housing demand started to decline in the fourth quarter of 2005, firms reacted promptly by sharply cutting housing starts. However, as housing starts represented only about a quarter of total house sales, the inventory of unsold houses started to increase rapidly and had not shown any major signs of stabilisation by October 2008.

As measured by the housing overhang, the excess stock of houses in the third quarter of 2008 amounted to around 1.2 million units. An alternative estimate of the excess housing stock can be derived from the home-owner vacancy rate. This measure was close to its historical peak at 2.8% in the third quarter of 2008, which meant that there were approximately 1 million housing units available on the markets. The speed at which this overhang is reduced in general depends on the trend growth in the number of households (around 1.3 million per year) and on the number of existing homes demolished (around 0.25 million per year). Since the number of housing starts is currently about 0.6 million units below the maintenance rate, it could take up to two years before the excess supply is eliminated.

All in all, it is likely that the US housing markets could reach a bottom only after a protracted period of downward price adjustment. This outlook is, however, highly uncertain since the situation with respect to supply and demand could be affected by several unexpected shocks. Risks relating to demand are linked to both the price and the availability of mortgages, as well as to the weakening of economic and employment growth. As regards the supply side risks, the rising foreclosure rates could contribute to prolonging the excess supply of housing units for sale, thereby prolonging the current supply-demand disequilibrium across the US housing market.

1 In Chart B, the nominal house price indices are divided by the owner-occupied rent component of the US consumer price index, which measures the price of the service that owner-occupied housing yields. The assumption on its future path is 2.5% growth, year-on-year, which is 0.5 percentage point below its average growth since the beginning of 2000.

REGION-SPECIFIC IMBALANCES

Non-euro area EU countries

Risks to financial stability in the non-euro area EU Member States have increased further since the June 2008 FSR, mainly as a result of both a deteriorating macroeconomic environment in most of these countries and declining asset prices. This assessment masks marked differences across countries. While the Baltic economies have experienced a significant slowdown, economic growth continues to be rather strong in other new EU Member States. In the United Kingdom, Sweden and Denmark, economic activity has slowed down further and remains relatively subdued. Overall, the balance of risks to the GDP outlook remains on the downside.

Following a period of very rapid house price increases, residential property markets are undergoing a significant correction in many non-euro area EU countries. In the United Kingdom, for example, house prices continued to decline strongly during the autumn and stood almost 15% below their levels of a year earlier in October. Although the peak-to-trough decline during the previous housing downturn in the early 1990s was more severe, house prices have, in recent months, declined at a faster pace in annual terms (see Chart 1.9).

Declines in asset prices have gone hand in hand with a further tightening of credit conditions in many non-euro area EU countries, which reflects both a tightening of the credit supply and reduced demand. The growth of credit to the private sector has started to decelerate in almost all non-euro area EU countries, although it remains generally strong in year-on-year terms (see Chart 1.10). In the United Kingdom, Sweden and Denmark, credit growth has moderated to around 10% in annual terms. In central and eastern Europe, it ranged from less than 20% in some countries to around 50% in others in recent months, and was coupled with a high share of foreign-currency lending.

Although the financial systems in the non-euro area EU countries have, all in all, continued to work well, access to funding has become more difficult for some banks in the region. Banks' vulnerability to credit risks has increased, particularly as some banks have high exposures to non-euro area EU economies that have shown signs of a macroeconomic slowdown since the publication of the last FSR.

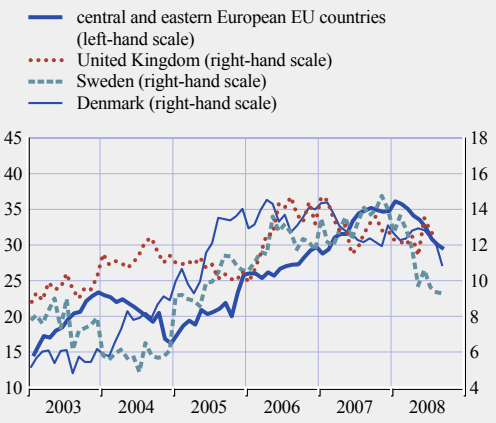
Chart 1.9 Residential property prices in the United Kingdom

(Jan. 1984 – Oct. 2008; percentage change per annum)

Source: Bank of England.
Note: Average of Halifax and Nationwide measures.

Chart 1.10 Credit to the private sector in non-euro area EU countries

(Jan. 2003 – Sep. 2008; percentage change per annum)



Sources: ECB and national central banks.

Looking ahead, although the correction in asset prices is a welcome development after a long period of very rapid price increases and a possible overvaluation in some countries, it poses significant risks to financial stability. These risks mirror the difficulties that the real estate sector and households in the non-euro area EU countries have in servicing their debt. The stock market declines may further limit the source of funding for the corporate sector. These risks could be reinforced by potential increases in market interest rates and a sharper-than-expected slowdown in central and eastern Europe, which add to the stresses and challenges already faced by the euro area financial sector (see Box 2).

Box 2

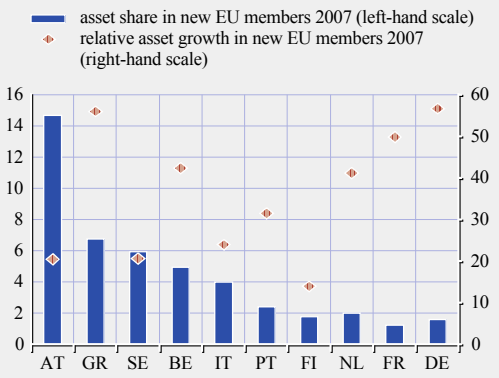
RISKS TO FINANCIAL STABILITY FROM NEW EU MEMBER STATES

Following a period of buoyant economic activity, which was also associated with the build-up of some financial imbalances, macroeconomic conditions in many new EU Member States deteriorated in the first half of 2008, albeit with marked differences across individual countries. Furthermore, in October 2008 financial markets in some central and eastern European (CEE) countries also suffered from heightened risk aversion as concerns about the negative macroeconomic impact of the financial turmoil spread to emerging markets. In view of the strong financial links between different parts of the EU, this also served as a reminder of the importance of channels for potential contagion between banking sectors in the euro area and those in the new Member States. Against this background, this box explores the extent to which the remote possibility of severe and prolonged macroeconomic stress in the new EU Member States could give rise to risks to euro area financial stability. The findings presented here are that the risks for euro area financial stability from adverse developments in new EU Member States are unlikely to cause systemic stress in the euro area banking sector. However, some euro area banks with sizeable exposures to new EU Member States could face a significant slowdown of their earnings growth in the event of a sharper-than-expected downturn in host countries.

On average, cross-border exposures of banks in euro area and non-euro area EU countries vis-à-vis new EU Member States are relatively contained, but vary significantly across different banking systems. In relative terms, the share of assets in new EU Member States was just above 3.3% of total assets in 2007 (see Chart A). Looking at individual countries, this share was the highest for banks in Austria (around 14%), Greece (6%), Sweden (6%), Belgium and Italy (both around 4%), while other euro area countries were exposed less. Despite this fact, new EU Member States recently presented a growth opportunity for euro area banking sector. On average in 2007, the growth of euro area banks' assets in this region was 35 percentage points higher than their total asset growth (see Chart A).

Chart A Asset share of EU banks' subsidiaries in new EU Member States and relative asset growth in 2007

(percentage)

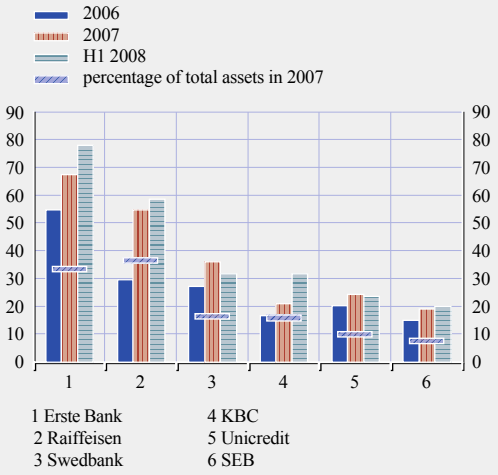


Sources: BIS, BSC and ECB calculations.

The country-level figures on asset shares could mask significant differences across individual banks. Furthermore, given the higher profit margins that can be realised in the banking markets of new EU Member States, the contribution of subsidiaries in the new EU Member States to group profits can be more substantial. Indeed, for the sample of large euro area banks and non-euro area EU banks which are most active in this region, the share of assets in new EU Member States in 2007 ranged between 7.5% and 36.5%, while the share of profits varied between 20% and 78.1% (see Chart B). This suggests that some large banks that are active in the region could be negatively affected in a scenario involving a possibly sharp deterioration in macroeconomic conditions in new EU members, which would cause higher delinquency rates and defaults on corporate and household loans in these countries.

Chart B Contribution of selected EU banks' subsidiaries in the new EU Member States to the profits of selected EU banking groups

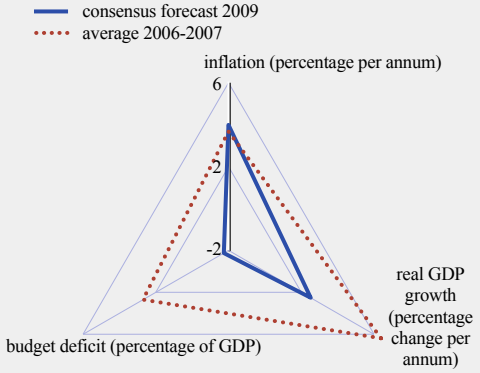
(percentage of group profits)



Sources: Individual institutions' financial reports and ECB calculations.
Note: In some cases, these figures also include the contribution of subsidiaries in non-EU countries (e.g. in countries of south-eastern Europe).

Against this background, adverse developments in new EU Member States could pose downside risks to the earnings growth of some euro area banks, in particular if the asset quality in this area deteriorates significantly, which could cause a sharper-than-expected increase in loan impairment charges. It is important to note that, for the region as a whole, the central scenario implies a substantial deterioration of macroeconomic conditions in 2009, as projected by market participants (see Chart C). Downside risks to growth have increased in most EU Member States of central and eastern Europe, owing to the prospect of declining export growth on account of a possible significant slowdown in euro area economies, a correction in some property markets and tightening credit conditions, with the latter partly due to increased funding difficulties. It should be noted that large differences exist between different parts of the CEE region as some new EU Member States have experienced a significant economic slowdown, while economic activity has remained relatively strong in many other CEE countries.

Chart C Macroeconomic developments and forecasts for new EU Member States



Sources: ECB and Consensus Economics.

The earnings prospects of banking groups active in this region will depend on the country-specific outlook. Given the deceleration of economic growth in the first half of 2008 and a significant correction of the housing markets, non-performing loan ratios have started to increase in some new EU Member States, albeit from a low level. In the face of a deterioration in loan quality, some euro area

and non-euro area parent banks had to significantly increase the loan impairment charges in their new EU Member State operations in the first half of 2008. This notwithstanding, the share of profits from operations in the new EU Member States remained stable or even increased for a number of banks in the first half of 2008.

However, those cross-border banking groups that are most exposed to the new EU Member States could face increasing earnings risks going forward if macroeconomic conditions in the host countries were to deteriorate significantly. In particular, banks that generate a substantial share of their profits from this region could see the contribution of operations in the new EU Member States to group profits decreasing due to slowing growth of operating income and increasing loan impairment charges.

Overall, exposures of the euro area banking system to new EU members are relatively contained, but vary greatly across different euro area banking sectors and institutions. In particular, some euro area banks derive a substantial proportion of their profits from their CEE operations, and could thus see their earnings growth slow considerably in the event of a sharper-than-expected downturn in host countries. Therefore, while risks stemming from banking operations in new Member States are unlikely to cause systemic stress in the euro area, they could – if coupled with other types of risk (liquidity risks and/or turmoil-related risks) – contribute to deeper systemic stress in the euro area financial sector. In this context, policies aimed at adjusting macroeconomic imbalances and addressing liquidity stresses are considered an important prerequisite for improving the access of financial intermediaries in the new Member States to funding markets and thereby mitigating risks to financial and macroeconomic stability in individual new Member States as well as their relevance for euro area financial stability.

Emerging economies

Macroeconomic and financial developments in emerging economies became significantly more challenging after the finalisation of the June 2008 FSR. Economic activity started to moderate due to diminishing growth prospects in mature economies, as well as on account of tighter external and domestic financing conditions. Therefore, the macroeconomic risks resulting from the reduced contribution of emerging economies to global demand rose.

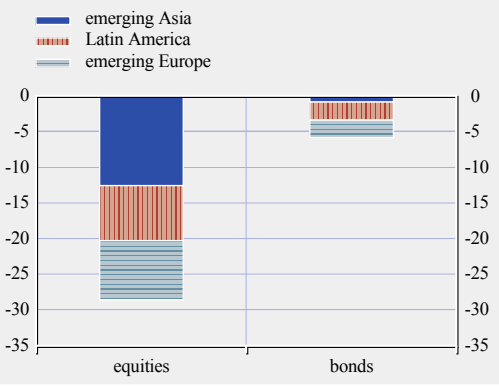
In a context of global deleveraging and mounting risk aversion, foreign investors reduced their exposures to emerging economy financial assets markedly. In particular, dedicated emerging market funds sold around USD 30 billion of emerging equities between May and October 2008, amid mounting concerns about the global implications of the US sub-prime crisis, a process that intensified in the wake of the failure of Lehman Brothers (see Chart 1.11).[5]

Persistent turbulence in financial markets weighed on those emerging economies that

5 Net sales of emerging bonds were smaller in magnitude, at about USD 6 billion.

Chart 1.11 Net sales of emerging economy equities and bonds by dedicated emerging market funds

(May 2008 – Oct. 2008; USD billions)



Sources: EPFR Global and ECB calculations.

rely on external financing to fund their current account deficits, particularly in Europe. Domestic credit growth started to decelerate, notably in the largest emerging economies (see Chart 1.12). Against the background of the intensification of the impact of the financial turmoil, authorities in emerging economies, including Brazil, China, Korea and Russia, took a range of responsive policy measures to avert potential real fallout, including interest rate cuts, a reduction of reserve requirements, other injections of liquidity for domestic banks and, when allowed by domestic circumstances, fiscal stimulus packages.

Moreover, persistently high food and energy prices might contribute to eroding domestic demand, a key factor supporting growth in emerging economies, in the period ahead. At the same time, the decline in oil and commodity prices from historical peaks since mid-July may further dampen capital inflows, notably in the commodity-exporting economies in Latin America.

Overall, the risks confronting emerging economies have increased significantly. From a euro area perspective, the risks related to a downward correction in the contribution of emerging economies to global demand have therefore risen further.

1.2 KEY DEVELOPMENTS IN INTERNATIONAL FINANCIAL MARKETS

US FINANCIAL MARKETS

The money market

Conditions in the US interbank market remained very tense after the finalisation of the June 2008 FSR. In October, LIBOR overnight index swap (OIS) spreads surged to record highs across longer maturities (see Chart 1.13). These tensions resulted from a high demand for liquidity by market participants, driven by their necessity to deleverage, extreme tensions in alternative funding markets and liquidity hoarding due to uncertainties about the value of many types of securities held by financial institutions (see the credit markets sub-section).

The Federal Reserve acted to relieve money market tensions with various credit facilities, which were extended and enhanced on 30 July 2008. The impact of these efforts, however, was offset somewhat by increased uncertainty following the default of large financial companies. In September and October, the

Chart 1.12 Nominal growth in domestic credit in large emerging economies

(Jan. 2001 – July 2008; percentage change per annum)

Sources: Global Insight and ECB calculations.
Note: Weighted average of nominal growth in domestic credit in Brazil, Russia, India and China.

Chart 1.13 Spreads between the one-month and six-month LIBOR and the OIS

(July 2007 – Nov. 2008; basis points)

Source: Bloomberg.

Federal Reserve announced measures to alleviate the pressure on money market funds, which had faced significant redemptions due to solvency concerns, and to improve liquidity in short-term debt markets.

Looking ahead, US money markets face risks related to the possibility of further bank failures – owing to mounting write-downs and losses – and to a renewed and severe dysfunctioning of funding markets.

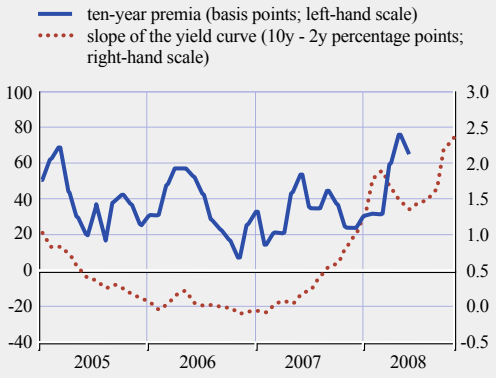
Government bond markets

Since July 2008, abating inflation concerns and renewed worries about the financial sector and economic activity contributed to flattening the slope of the US yield curve from its peak in early 2008 (see Chart 1.14). The bail-out of financial institutions and the financial guarantee plan appeared to drive an increase in US bond market premia. As a result, the term premium reached the highest level recorded since 2005.

In the autumn, however, the US yield curve steepened again, mainly reflecting monetary policy decisions taken by the Federal Reserve.

Chart 1.14 Slope of the US yield curve (ten-year minus two-year) and term premia in ten-year US government bond yields

(Jan. 2005 – Nov. 2008)



Sources: Reuters and ECB calculations.
Note: US term premia data are from D. H. Kim and J. H. Wright, "An Arbitrage-Free Three-Factor Term Structure Model and the Recent Behavior of Long-Term Yields and Distant-Horizon Forward Rates", *Board of Governors of the Federal Reserve Finance and Economics Discussion Papers*, No. 33, 2005.

Looking ahead, bond yields may increase if the turbulence eases, as US government bonds may experience weaker demand from countries running large current account surpluses, and if it were to prompt an unwinding of the flight-to-safety flows that had resulted from a lower risk appetite among investors.

Box 3

TRANSMISSION OF US DOLLAR AND POUND STERLING MONEY MARKET TENSIONS TO THE EURO MONEY MARKET

This box quantitatively evaluates the interaction between the tensions in three important money markets (the US dollar, pound sterling and euro money markets) by testing the hypothesis that tensions in the euro money markets can be attributed to tensions in the other two markets and the long-term no-arbitrage condition among them. The analysis attempts to determine the direction of the transmission of money market tensions, and it assesses the possible reasons for the directions detected.

The transmission of money markets tensions is modelled using a cointegrated VAR framework, with three-month deposit/OIS spreads as endogenous variables.[1] Daily spreads from 1 July 2007 to 11 September 2008 were used to give 314 observations. Money market integration causes the

1 This is the most commonly used maturity in studies of a similar nature. See, for example, Bank of Japan, "Cross-currency transmission of money market tensions", 2008.

three spreads to co-move closely through time.[2] To model this apparent long-run dependence, a cointegrated VAR model was used, and two cointegrating relations were found for the USD/EUR spreads and the GBP/EUR spreads respectively.[3,4] In this framework, evidence supports the claim that, in the short term, unexpected tensions are transmitted from the US dollar and pound sterling money markets to the euro money market, but not vice versa:

- First, the US dollar and pound sterling money market spreads are weakly exogenous, indicating that they are the attracting vectors on which the euro spreads converge. This was confirmed with Granger causality tests, which indicated that combined USD and GBP spreads Granger cause euro area spreads, controlling for reversed causality.

- Second, after orthogonalising the shocks, it can be noted that a unit basis point increase in the three-month GBP spread leads to an increase of 0.8 basis points in the euro spread after around 10 working days, while the same increase in the USD spread leads to an increase of 0.85 basis points over the same period. On the other hand, after an exogenous shock to euro spreads, the USD and GBP spreads do not increase significantly at the 95% confidence level.

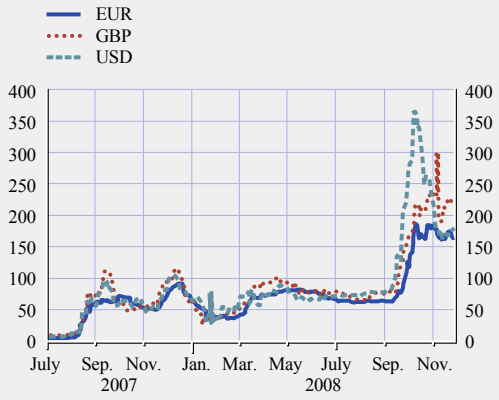
- Third, in the variance decomposition of euro spreads, USD and GBP spreads explain around 75% of these movements 20 days ahead, while the share of euro tensions in the other two spreads is substantially lower (at most 10% of movements 20 days ahead can be explained with euro area market tensions).

Why are money market tensions in the US markets transmitted to the euro money market? One important channel is the foreign exchange swap market as a provider of US dollar liquidity. At the outset of the market turbulence in August 2007 and the start of a significant repricing of counterparty credit risk, non-US financial institutions increasingly took recourse to the foreign exchange swap markets (euro money market spreads and foreign exchange swap spreads are both positively correlated and, since August 2007, foreign exchange swap spreads have generally moved in the same direction as the spreads between deposit rates and OIS rates (see Chart B)). Foreign exchange swap rates increased because of higher counterparty risk, and the market became less liquid as liquidity became more valuable at the outset of the market turbulence.[5] This increased swap rate carried through to the unsecured euro interbank markets and, as a final result, euro money market spreads increased in times of higher tensions in the US dollar money market.

2 The integration of money markets was tested by restricting the cointegrating coefficients in the relations between the three markets to unity; Wald tests failed to reject these restrictions.
3 Preliminary testing indicated that the three money market spreads are integrated to order one, which is intuitive in view of the fact that market participants would eliminate any arbitrage opportunities that would persist across the money markets in the long run.
4 Based on a model with four lags in first differences, no trend and an unrestricted constant. The lag length was determined using the AIC criterion. The resulting model is well-behaved as the residuals do not exhibit autocorrelation, skewness or ARCH-type behaviour. The three spreads are non-stationary in the time period examined. ADF tests determined non-stationarity, and the Johansen approach to cointegration was taken.
5 Banks not headquartered in the United States can refinance part of their balance sheets in US dollars in several ways. The most obvious is to buy dollars against domestic currency (and to borrow the domestic currency in the repo market, the unsecured interbank market or from its central bank). This, however, creates a substantial foreign exchange balance sheet exposure that must be hedged. The required hedge normally involves buying a forward. Since a foreign exchange swap is equivalent to buying a currency outright and selling it forward, it is clear that non-US financial institutions with exposure to liquidity support for ailing US mortgages first take recourse to the foreign exchange swap market to cover their US dollar needs.

Chart A Three-month money market spreads: USD, EUR and GBP

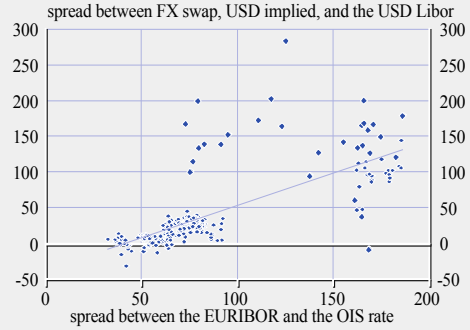
(July 2007 – Nov. 2008; basis points)



Source: Bloomberg.

Chart B Spread between the three-month foreign exchange swap, USD implied, and the USD Libor as a function of the spread between three-month EUR deposits and the OIS

(Aug. 2007 – Nov. 2008; basis points)



Source: Bloomberg.

An alternative to foreign exchange swap lending is to borrow unsecured US dollar funds in the interbank market, which should, however, be more expensive due to higher credit risk.[6] The significant repricing of counterparty credit risk in the summer of 2007 led many US providers of US dollar liquidity to become more reluctant to lend to non-US financial institutions. At the same time, the latter faced rising US dollar liquidity needs, in particular on account of their exposures to US dollar asset-backed commercial paper (ABCP) conduits and structured investment vehicles. Widespread risk aversion induced investors to significantly reduce their demand for US dollar ABCP; as a result, those structures had to rely on their sponsor banks to provide them with US dollar liquidity, which again widened US dollar money market spreads.

The analysis shows that tensions in US dollar and pound sterling money markets are more likely to be transmitted to the euro money market than vice versa. Therefore, in order to address euro money market tensions, central banks could continue to facilitate access to US dollar funding. Central banks already took measures aimed at improving the circulation of US dollar liquidity throughout the world, in particular by way of the Term Auction Facility (TAF) agreed in connection with the foreign exchange swap lines between the Federal Reserve, the ECB and the Swiss National Bank, which was recently extended to include even more central banks. While these measures have certainly helped to address non-US financial institutions' US dollar funding needs, the foreign exchange swap market remains under considerable stress.

6 A foreign exchange swap is a quasi-collateralised transaction and carries much less credit risk than unsecured lending.

Credit markets

The repricing of credit risk continued after the finalisation of the June 2008 FSR. After the rescue of Bear Stearns in mid-March, US credit markets were shaken yet again in mid-September, amid uncertainty created by the collapse of Lehman Brothers and a series of rescue take-overs in the global banking sector. By the end of September, credit default swap (CDS) indices had reached historical highs across all categories, for both the financial and the non-financial sector, as confidence in debt securities collapsed, funding conditions remained challenging and fears of contagion from the US financial sector to the corporate sector grew. At the same time, issuance of asset-backed securities (ABSs) and collateralised debt obligations (CDOs) remained sluggish.

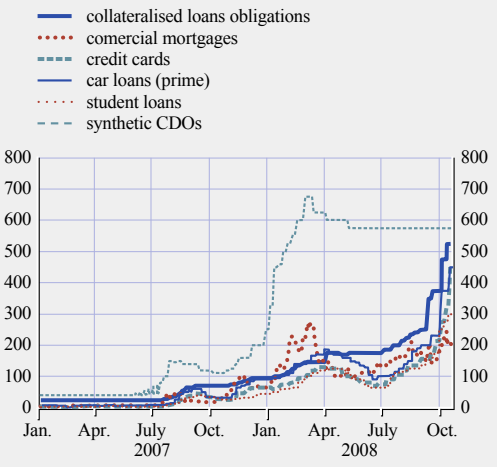
Chart 1.15 Value index of CDSs on US asset-backed sub-prime non-agency securities (ABX indices)

(July 2007 – Nov. 2008; par value = 100)

Source: JPMorgan Chase & Co.

Chart 1.16 Credit default swap (CDS) spreads on various US AAA-rated asset-backed securities and USD collateralised loan obligations (CLOs)

(Jan. 2007 – Oct. 2008; basis points)



Source: JPMorgan Chase & Co.

The US government's plans, the Troubled Asset Relief Program (TARP), which aimed at restoring confidence in the ABS market by authorising the US Treasury to take troubled assets off the balance sheets of financial institutions, followed by capital injections to banks, helped to reduce the perceived risk of further defaults, resulting in a tightening of banks' CDS spreads. Nevertheless, CDS premia for global large and complex banking groups (LCBGs) remained at relatively high levels, reflecting market uncertainty about the implementation of the program, its influence on particular institutions and concerns over the impact of higher funding costs in the banking sector.

After the finalisation of the June 2008 FSR, the par values of sub-prime mortgage-backed securities (MBSs) implied from CDS spreads decreased further across the rating spectrum, as expectations of the depth of repricing in the US housing market were reassessed (see Chart 1.15). Nevertheless, since July 2008, there have been signs of some stabilisation – in particular, US sub-prime ABS prices did not react strongly to the episode of repricing in September and October 2008, suggesting they may have reached their intrinsic values.

Single-name CDS premia increased most in the consumer and car manufacturing sectors, reflecting market participants' fears of an increased default risk in these sectors. This was accompanied by the substantial widening of CDS spreads on various ABSs backed by credit card and car loan receivables. In particular, spreads for triple-A ABSs backed by US prime auto loans, government guarantees, student loans and credit card receivables reached new highs in October 2008, doubling in only three weeks. These increased strains were related to the US economic outlook and to uncertainty about the impact of the TARP on the structured credit market (see Chart 1.16). This was accompanied by a substantial widening of the CDS spreads on collateralised loan obligations (CLOs), which had thus far performed relatively better than more complex CDO structures, to reach the levels seen by CDOs in May 2008.

Issuance conditions remained sluggish, although some recovery in the issuance of residential mortgage-backed securities (RMBSs) was noticeable by September 2008 (see Chart 1.17). Nevertheless, the slight upturn in RMBS issuance may largely be explained by the change in the Federal Reserve's policy on the eligibility of collateral, and issuance levels

of these securities still remained substantially below those seen between 2003 and mid-2007.

Likewise, leveraged loan issuance in the United States remained weak, standing at USD 250 billion for the first three quarters of 2008, well below the levels observed in 2007 (USD 700 billion for the whole year).[6] Despite the government's efforts to revive credit markets, borrowing conditions are likely to remain challenging for speculative-grade borrowers, primarily on account of the impact of the deteriorating macro-financial environment on cash-flows and the default risk of leveraged-buyout (LBO) firms. Beyond banks' reluctance to extend credit (at a point where LBO firms are facing considerable refinancing needs),[7] there has been a significant reduction in the number and type of providers of funding to issuers of high-yield bonds and leveraged loans. Outflows from hedge funds and mutual funds, as well as the suspension of CLO issuance, have put additional pressure on available credit.

Looking ahead, the possible global economic slowdown and the risks persisting in the financial system are likely to keep credit spreads at elevated levels. The influence of the US government bail-out programme on the conditions in the structured credit markets is uncertain. Moreover, the relief derived from that programme may differ across institutions, depending on how these institutions value the assets on their balance sheets. In this environment, the restoration of confidence in the credit markets and, in particular, the structured credit markets – which could boost the issuance of ABSs – may take some time. Moreover, some segments of the structured credit markets may not recover unless better pricing models are developed. Until then, investors may prefer simpler structures, which would limit the supply of CDOs, the vehicle that drove securitisation before the turmoil erupted.

Equity markets

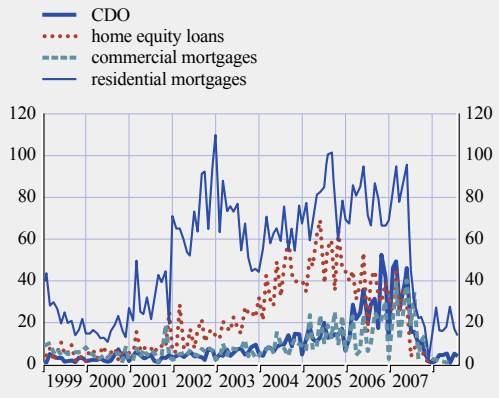
US equity markets have experienced sharp declines since the publication of the last FSR (see Chart S26). Growing worries about the health of financial institutions, news of large

6 According to Bloomberg and Fitch data.

7 It is estimated that, at the global level, more than USD 500 billion of leveraged loans and high-yield bonds will have to be refinanced between 2008 and 2010.

Chart 1.17 Securitisation volumes in the United States by type of collateral

(Jan. 1999 – Aug. 2008; USD billions; three-month moving average)



Source: Dealogic.

Chart 1.18 Implied volatility in US equity markets

(Jan. 2007 – Nov. 2008; percentage)

Source: Bloomberg.
Note: The spot implied volatility index represents the VIX index, and the futures series show the expected future levels of spot implied volatility (and related premia) as implied by futures contracts written on the VIX index.

losses related to mortgage-backed instruments, and increasing concerns about the economic outlook and its impact on company earnings continued to exert downward pressure on major stock indices.

The sharp increases in near and medium-term implied stock market volatility are a clear indication of the tensions in the US stock market (see Chart S27). The approval of the TARP and related measures seemed to ease short-term uncertainty, but futures on the volatility index of the Chicago Board Options Exchange (VIX) over longer horizons suggested that stock market uncertainty remained broadly unchanged (see Chart 1.18). The price/earnings (P/E) ratios of US listed companies, however, remained slightly above historical averages.

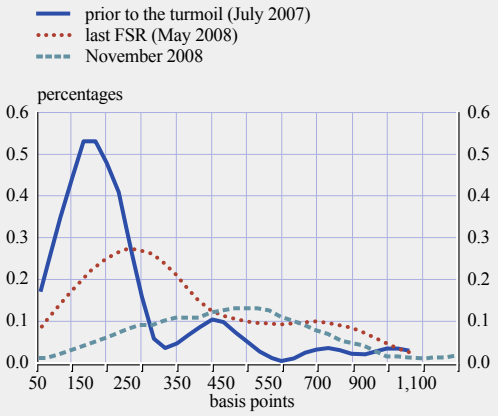
Looking ahead, the main risk confronting the US equity market is that future earnings growth cannot be met on account of the more challenging economic outlook and the need for financial institutions to continue to adjust their balance sheets.

EMERGING FINANCIAL MARKETS

Emerging economy financial markets, which remained relatively resilient in the early stages of the current turmoil, have witnessed a significant change in their environment since the last FSR. Emerging market equity valuations lost about 50% between May and end-November 2008 (see Chart S39), the Emerging Market Bond Index Global (EMBIG) spread widened by more than 400 basis points (see Chart S37), and yields on long-term domestic bonds declined by 60 basis points.

Investor sentiment in emerging credit markets was dampened by rising inflation in emerging economies, and by expectations of slower growth in mature economies, and worsened significantly after the failure of Lehman Brothers. This contributed to a significant tightening in the external and domestic financing conditions of emerging economies. Spreads on CDSs and international bonds of emerging sovereigns with weaker fundamentals increased, sparking discussions of a possible "return of traditional emerging market risk" (see Box 4). The widening of the distribution of emerging sovereign bond spreads since the onset of the turmoil was also suggestive of greater differentiation by international investors across issuers (see Chart 1.19).

Chart 1.19 Distribution of emerging market sovereign bond spreads



Sources: JPMorgan Chase & Co and ECB calculations.
Note: Smoothed densities estimated with an Epanechnikov kernel.

Conditions in interbank markets also deteriorated in some economies (such as Hong Kong, Russia and South Korea), with short-dated interest rates rising significantly. With growth in emerging economies starting to moderate, the correction in

Chart 1.20 Emerging economy equity markets relative to the US equity market

(July 2007 – Nov. 2008; July 2007 = 100)

Sources: Bloomberg and ECB calculations.
Note: MSCI index (USD-adjusted) for a broad set of emerging economies divided by the S&P 500.

emerging equity markets that followed the last FSR was sharper than that in mature markets. By end-November, emerging equity markets performed significantly less well than US markets, although the former had outperformed the latter in the initial phase of the turmoil (see Chart 1.20). The correction was most significant in markets with initially high P/E ratios and presumably stretched valuations, as well as in those sensitive to the reversal in oil and commodity prices after mid-July and in markets where foreign investors reduced exposures markedly. Trading was suspended in some cases (e.g. Russia) when daily losses reached regulatory limits. Rising portfolio outflows heightened volatility in the foreign exchange markets and prompted authorities to intervene in support of their currency (e.g. Brazil, Mexico, Russia and South Korea), resulting in reserve losses.

Looking ahead, developments since the last FSR have confirmed that financial markets in emerging market economies are more vulnerable to real and financial market events in mature economies than initially considered at the outset of the turmoil. The so-called "decoupling theory" has thus been proved wrong, even for the largest emerging economies that had harboured the greatest hopes. Emerging financial markets remain, therefore, a source of market risk for euro area financial institutions.

Box 4

A RETURN OF TRADITIONAL EMERGING MARKET RISK?

Before the onset of the financial market turmoil in the summer of 2007, risk premia for emerging market assets displayed a notable decline. In part, this decline was justified by a strengthening of the debt-repayment capacities of many emerging markets and by their large current account surpluses. To some extent, however, it also reflected a disregard for traditional measures of emerging-market risk amid a global hunt for yield and abundant liquidity. Some pockets of vulnerability have persisted, for example, in countries neighbouring the EU and in some new EU Member States (see Box 2) that run considerable current account deficits. In addition, sizeable capital inflows to emerging markets may cease or contribute to macroeconomic overheating.

Among other indicators, the improvement in emerging markets' resistance to external shocks was reflected in the compression of their sovereign debt spreads. The JP Morgan Emerging Market Bond Index Global (EMBIG) reached lows of around 100 and 200 basis points for sovereign bonds rated investment and non-investment-grade respectively in June 2007. After the outbreak of the financial turmoil, spreads widened and financial markets began to progressively discriminate amongst emerging market borrowers of different credit quality. The gap between JP Morgan EMBIG spreads on investment and non-investment-grade emerging market economy bonds increased from around 100 basis points on 1 July 2007 to more than 200 basis points on 31 July 2008.

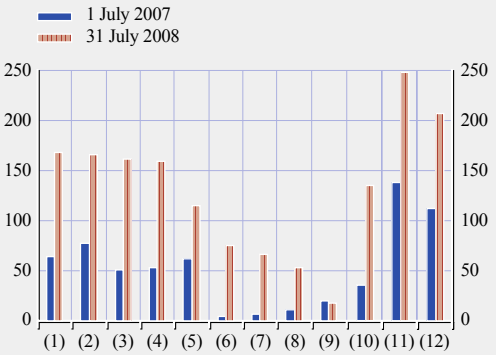
To gauge which aspect of country risk featured most prominently in this reassessment, this box examines the evolution of emerging market spreads across groups of countries that share similar vulnerabilities.[1] The countries are, therefore, ranked according to their relative positioning in

1 The analysis includes those countries that are represented with a weight of more than 0.5% in the JP Morgan EMBIG, namely Argentina, Brazil, Chile, China, Colombia, Ecuador, Indonesia, Kazakhstan, Lebanon, Malaysia, Mexico, Panama, Peru, the Philippines, Russia, South Africa, Turkey, Ukraine, Uruguay, and Venezuela. Kazakhstan was excluded from the analysis due to a lack of data.

respect of a range of country risk measures in 2007.[2] These measures include traditional indicators related to the capacity to service external debt along with macroeconomic overheating, in combination with a lending boom that may lead to a disorderly adjustment. Two qualitative indicators are also considered, namely political risk and the exchange rate regime. For each measure, a weighted average JP Morgan EMBIG spread is computed for the tercile of countries with the least risky profile (first tercile), and is compared with that for countries with the riskiest profile (third tercile). The findings are presented in Chart A. From the developments between 1 July 2007 and 31 July 2008, the following observations become clear:

Chart A Differences in JPMorgan EMBIG spreads between high and low-vulnerability emerging markets

(basis points)



(1) Foreign exchange reserves as a share of imports of goods, services and income.
(2) General government balance as a share of GDP.
(3) CPI inflation.
(4) Foreign exchange reserves as a share of short-term external debt.
(5) External debt as a share of GDP.
(6) Domestic credit growth.
(7) Real GDP growth.
(8) Current account balance as a share of GDP.
(9) External debt as a share of exports of goods, services and income.
(10) Exchange rate regime.
(11) Political risk.
(12) Rating.

Sources: IIF, IMF, JPMorgan Chase & Co., Bloomberg and ECB calculations.
Note: (1)-(9) Difference between the third tercile and the first tercile; (10) Difference between countries with some form of pegged exchange rate and those with a freely floating regime; (11) Difference between countries with a high and a low political risk; (12) Difference between countries rated investment grade and non-investment grade by at least two rating agencies.

A rising discrimination between emerging market economies in the third tercile and those in the first was apparent with respect to most indicators considered. This was most notable in the case of foreign exchange reserves (expressed as a percentage of imports and short-term debt), fiscal balances and inflation, suggesting that market participants increasingly price the risk of overheating in some emerging markets. This observation is confirmed by a widening of the difference in sovereign spreads between countries with rapid GDP growth when compared to those with moderate growth. Likewise, market concerns about rapid credit growth, which may lead to imprudent lending and deteriorating credit quality, also increased.

Turning to the qualitative indicators, not surprisingly, spreads for emerging markets with a higher political risk in 2007 widened most. Furthermore, fixed exchange rate regimes were seen by market participants to be more risky than free-floating currencies, possibly reflecting concerns about the possibility of disruptive exchange rate moves, episodes of capital-flow reversals and the build-up of currency mismatches.

Summing up, the results show that traditional country risk measures have returned as a gauge of emerging market vulnerabilities for which bond investors demand a premium. In addition, concerns about rising inflationary pressures in an environment of macroeconomic overheating

2 The country risk measures considered broadly follow those in the academic literature (see, for example, IMF, "Debt- and Reserve-Related Indicators of External Vulnerability", 2000, M. Bussiere and M. Fratzscher, "Towards A New Early Warning System of Financial Crises", *Journal of International Money and Finance*, No 25, 2006, and G. L. Kaminsky, "Crises and Sudden Stops: Evidence from International Bond and Syndicated-Loan Markets", *Bank of Japan Institute for Monetary and Economic Studies Discussion Paper Series*, 2008). An indicator of political risk was obtained from the *Economist Intelligence Unit*. It is unavailable for Lebanon, Panama, and Uruguay. The classification of exchange rate regimes follows the IMF's de facto methodology introduced in 1997.

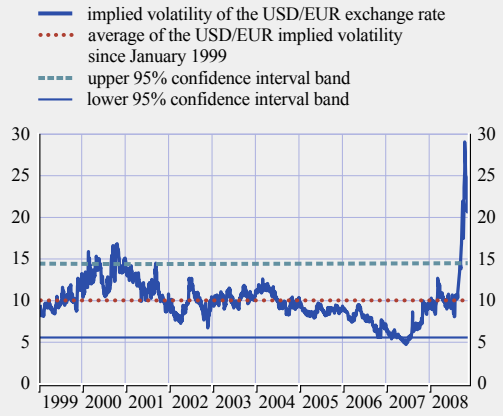
seem to have risen. From a global financial stability viewpoint, the heightened awareness and the proper pricing of these risks are a positive development. Nevertheless, risks in some emerging markets have increased due to domestic and global factors. A disorderly adjustment in a major emerging market could have negative repercussions on the global financial system and might lead to an increase in risk aversion. However, the direct exposure of euro area banks to those emerging markets whose spreads have deteriorated most remains limited at USD 120 billion; for the remaining countries discussed, it amounts to USD 800 billion. This contrasts with total euro area bank lending of USD 2,300 billion to emerging markets, which includes exposure to EU new Member States (see Box 2).

FOREIGN EXCHANGE MARKETS

Since the last FSR, there have been large movements in the main foreign exchange rates. Between 16 June and 5 November, the euro depreciated by 8.2% in nominal effective terms vis-à-vis the basket of currencies of the euro area's 22 main trading partners. The strong depreciation of the euro against the US dollar initially stemmed from a re-assessment by market participants of the relative resilience of the US economy. Subsequently, however, the strengthening of the US dollar has been driven by massive repatriations of foreign investments to the United States, as well as by increased demand for dollars by a number of international banks.

Chart 1.21 Implied volatility of the USD/EUR exchange rate and its historical range

(Jan. 1999 – Nov. 2008; percentage)



Source: Bloomberg.
Note: The horizontal lines display the mean value along with the 95% confidence band for the EUR/USD implied volatility. The average and the standard deviations are based on the values of the implied volatility between 1 January 1999 and 27 November 2008.

In November, exchange rate uncertainty, measured by realised volatilities, reached values close to the historical peaks of 1985. Implied volatilities also rose and posted record values for the euro era. Looking ahead, implied volatilities for the one and three-month horizons have risen significantly, and by more than longer-term volatilities. It appears, therefore, that markets expect that short-term swings in foreign exchange rate levels may continue (see Chart 1.21). As longer-term expectations for volatility are close to historical averages, however, swings are expected to dampen significantly over a one-year horizon.

COMMODITY MARKETS

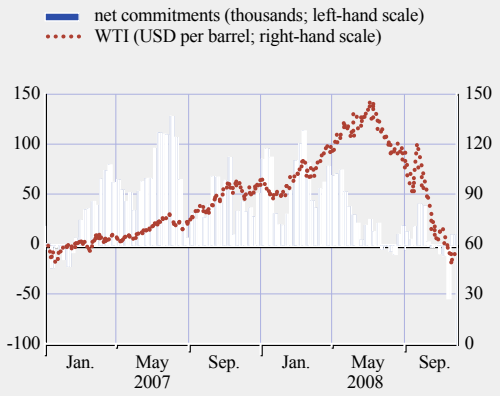
Oil price volatility increased substantially after the finalisation of the last FSR. Large swings in oil prices were caused by weaker macroeconomic fundamentals, changes in the trading strategies of many financial institutions (see Section 1.3) and concerns about a global macroeconomic slowdown, triggering a sharp decrease in prices (see Chart 1.22).

The recent decline in prices was driven mainly by a perceived reduction in demand, motivated by gloomy prospects for the global economy. Against this background, OPEC'S decision to cut supply failed to prevent prices falling, amid expectations of an expansion in OPEC production capacities in 2009 and 2010 when new fields are expected to come online.

Non-energy commodities experienced price volatility in the same period. While prices of most base metals declined on worries of slower

Chart 1.22 Speculative positions on oil futures and oil prices

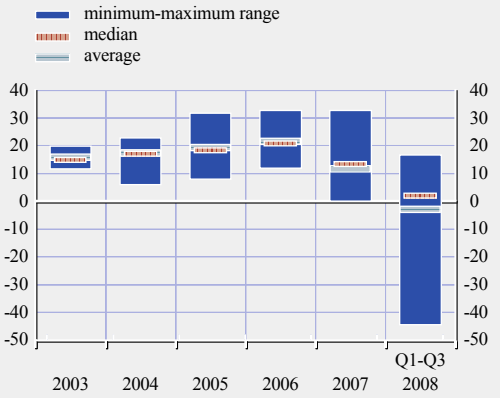
(Jan. 2007 – Nov. 2008; net future commitments of non-commercials on the New York Mercantile Exchange)



Source: Bloomberg.
Note: Net commitment = number of long – number of short contracts, where each contract represents 1,000 barrels. "Non-commercial" denotes entities not engaged in crude oil production or refining.

Chart 1.23 Return on equity for global large and complex banking groups

(2003 – Q3 2008; percentage)



Sources: Individual institutions' financial reports and ECB calculations.

growth in global demand, those for precious metals were more stable, acting as possible safe havens amid the tensions.

Looking ahead, oil price volatility is likely to remain high, fuelled by investors' risk perceptions and the uncertain economic outlook.

1.3 CONDITIONS OF GLOBAL FINANCIAL INSTITUTIONS

GLOBAL LARGE AND COMPLEX BANKING GROUPS AND GOVERNMENT-SPONSORED ENTERPRISES [8]

Accounting and market performance of global large and complex banking groups

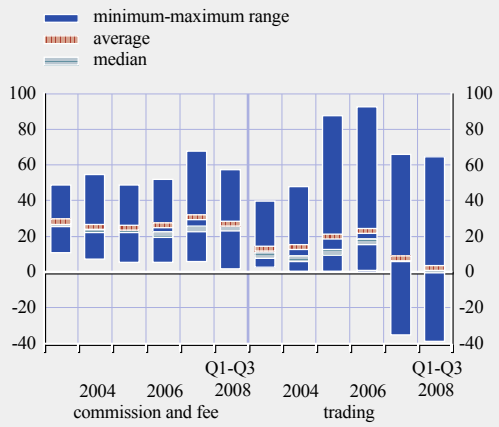
The return on equity (ROE) of global large and complex banking groups (LCBGs) in the first nine months of 2008 was depressed further by large write-downs on sub-prime assets, as well as by an unfavourable capital market and trading environment. The median ROE in the first three quarters of 2008 amounted to 2%, down from 13.4% in 2007. Chart 1.23 also shows a large downward dispersion in the distribution of bank profitability in the first three quarters of 2008, with some global LCBGs reporting extremely bad results. The disclosures made by institutions with bad results may signal their intentions to de-risk and deleverage their balance sheets and to drastically write down their portfolios of structured products, in attempts to address market uncertainty about their condition. However, as described in the next sub-sections, this did not stop the financial crisis from escalating.

The impact of the financial turmoil was felt most acutely by institutions with significant investment banking activities, as noted in the June 2008 FSR. Fee income from debt underwriting associated with leveraged buyout (LBO) activity, equity underwriting, and structuring and distributing credit products fell substantially in early 2008, although there have been signs of recovery more recently. As a result, the median ratio of fee and commission income to shareholders' equity edged up from

8 For a discussion on how global large and complex banking groups are identified, see Box 10 in ECB, *Financial Stability Review,* December 2007. The institutions included in the analysis are Bank of America, Bank of New York Mellon, Barclays, Citigroup, Credit Suisse, Goldman Sachs, HBOS, HSBC, JP Morgan Chase & Co., Merrill Lynch, Morgan Stanley, Royal Bank of Scotland, State Street and UBS. However, not all figures were available for all companies.

Chart 1.24 Fee, commission and trading revenues of global large and complex banking groups

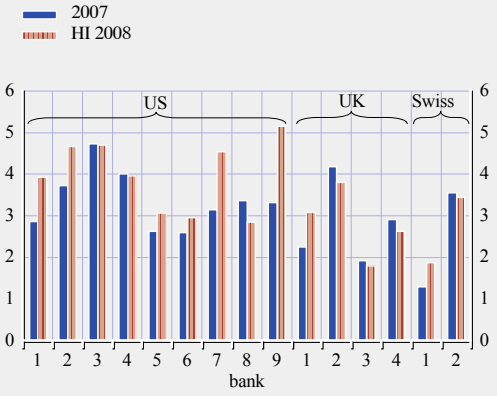
(2003 – Q3 2008; percentage of shareholder equity)



Sources: Individual institutions' financial reports and ECB calculations.

Chart 1.25 Tangible equity-to-asset ratio for global large and complex banking groups

(percentage)



Sources: Individual institutions' financial reports, Bureau van Dijk (Bankscope) and ECB calculations.

just below 24% in 2007 to just below 25% in the first nine months of 2008 (see Chart 1.24). This includes revenues from market-making, prime brokerage, hedge fund servicing and asset management.

Trading income was affected even more severely than other sources of income. Average trading income, expressed as a percentage of shareholders' equity, fell from just over 7% in 2007 to 1% in the first three quarters of 2008. It can also be seen from Chart 1.24 that the dispersion across institutions continued to widen. In the second quarter of 2008, most investment banks faced a very significant number of days with trading losses, and the financial results for the third quarter suggest that this continued also in this period.

Mark-to-market and other financial crisis-related losses of global LCBGs continued to accumulate in the first nine months of 2008. They reached a total of almost USD 210 billion during this period, compared with USD 122 billion in the second half of 2007.[9] Expressed as a percentage of equity capital, this amounted to 20%, up from 12.5% in the latter half of 2007. Importantly, these losses were fully covered by capital injections, leaving the LCBGs' ratios of tangible equity to assets unaffected (see Chart 1.25 and Chart 4.5). As mentioned above, these losses reflect not only the continued decline in values of structured credit products, but also a more aggressive de-risking of exposures by global LCBGs.

Government-sponsored enterprises in conservatorship

The two major GSEs, Freddie Mac and Fannie Mae, are important for global financial stability as they own or guarantee almost half of the USD 12 trillion mortgage market in the United States. Besides potential asset valuation write-downs, strains at GSEs can lead to increased counterparty risks in the interest rate derivatives and CDS markets, where these entities play an important role, and may have repercussions for the US economy through an impairment of the functioning of the whole US mortgage market.

In July this year, these GSEs were struck by fears that they would not be able to raise sufficient capital to withstand further write-downs related to deteriorating US housing market conditions. This led to a drop of 40% in their stock prices,

9 In the fourth quarter, another USD 70 billion had already been reported by the cut-off date of this FSR.

and to action by the Federal Reserve and the Treasury, allowing the Federal Reserve to temporarily increase the GSEs' lines of credit and to purchase their stock, as well as giving it a role in prudential oversight and to lend at the primary credit rate. Together with a temporary ban on uncovered short selling by the Securities and Exchange Commission (SEC), this helped to stabilise the situation in the very short run.

Concerns about a possible bailout re-emerged in late August, which led to sharp increases in the yields on newly issued bonds and in renewed pressure on the share prices of these institutions. Finally, on 7 September, Fannie Mae and Freddie Mac were placed under conservatorship and several supportive measures were announced. The Federal Housing Finance Agency (FHFA) was granted direct oversight of the GSEs, while the Treasury was given authority to inject capital (initially USD 1 billion, but up to USD 100 billion into each entity) and to purchase agency-backed MBSs (initially USD 5 billion), with a short-term (unlimited) credit facility also being established. The GSEs will be able to expand their mortgage guarantee business, while their investment portfolios will be allowed to expand moderately right up to the end of 2009. Beginning in 2010, the GSEs will be required to reduce their investment portfolios by 10% per annum, until they reach USD 250 billion.

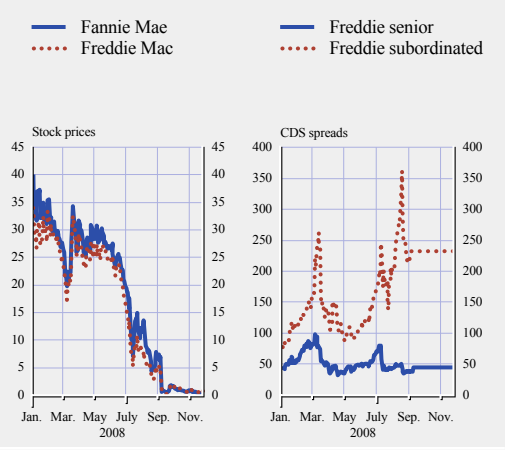
US investment banking model unwound and spillover effects

US investment banks borrow very short-term funds and they used to be more highly leveraged than commercial banks, while they lend and invest into more illiquid and long-term instruments. They are of vital importance for various parts of the global financial system, inter alia, because they are highly interconnected and key players in the derivatives markets.

Immediately after the second GSE shock, tensions emerged among US investment banks, especially Lehman Brothers. After pre-announcing disappointing third-quarter figures, Lehman Brothers was unable to raise capital, or to find strategic investors. The firm found itself subject to a destructive run on its liquid assets and was ultimately forced to file for creditor protection under Chapter 11. Speculation also turned to Merrill Lynch, which agreed to be taken over by Bank of America.

Chart 1.26 Stock price and five-year credit default swap (CDS) for Freddie Mac and Fannie Mae

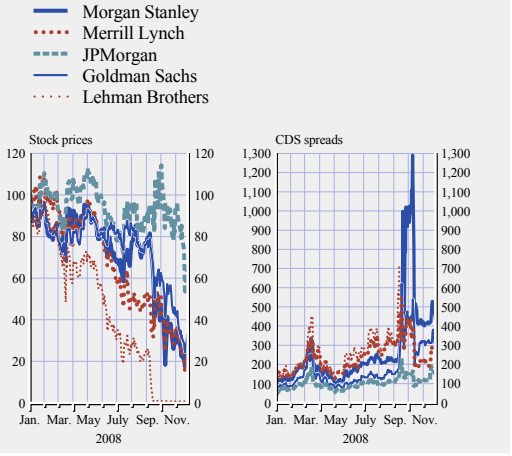
(Jan. 2008 – Nov. 2008; spreads in basis points, five-year maturity)



Source: Bloomberg.

Chart 1.27 Stock prices and CDS spreads of major US investment banks

(Jan. 2008 – Nov. 2008; stock price index: Jan. 2008=100; spreads in basis points; senior debt; five-year maturity; basis points)



Source: Bloomberg.

The other two remaining investment banks, seeing their stock prices drop sharply and fearing they could also see their access to liquidity and capital markets curtailed, decided to transform themselves into commercial bank holding companies. This provides them with lender-of-last-resort support and deposit insurance, and the flexibility to use deposits as a source of funding, albeit at the cost of greater regulatory scrutiny. This move also heralds the end of the US investment banking system, which may negatively reflect on future financial innovation as these investment banks were the engine driving new and complex financial products.

After the disappearance of Lehman Brothers and Merrill Lynch, the crisis hit the money market funds, as the market was left without buyers for short-dated paper, as described in Section 1.2. This also led to pressure on major custodians. In addition, AIG, the world's largest insurer, was hit by speculation about its solvency, as described below.

These events spilled over to other US banks and thrifts, as well as to euro area and other European banks, either because they were heavily exposed to the above-mentioned companies or because they were perceived to be relatively vulnerable with respect to their own situation (see also Section 4.1). In the United States, Washington Mutual, the biggest thrift with a nationwide business, was seized by the Federal Deposit Insurance Corporation (FDIC) after a series of downgrades. Wachovia, weakened by losses on its sizeable option ARM portfolio, fell prey to negative sentiment and was eventually acquired by Wells Fargo. In the United Kingdom, Bradford and Bingley, a former building society, had to be rescued, and its branches and deposits were acquired by Santander. In Iceland, all three major banks had to be nationalised following difficulties in refinancing short-term debt and a run on deposits of branches in the United Kingdom. Even Citigroup, the largest US bank, came under attack in the week of 17-21 November, with its stock price falling by 60% in one week. US authorities quickly announced an aid package, after which the stock price recovered.[10]

Drastic policy actions ensued [11]

In response to this drastic chain of events, the US Treasury unveiled plans on 19 September to buy troubled assets from banks, for up to USD 700 billion. This would, according to the authorities, provide liquidity, promote price discovery and reduce investor uncertainty. The initial reaction of markets was positive, with bank CDS spreads narrowing and stock prices rising. Furthermore, the Treasury also announced a USD 50 billion plan for insuring money market funds. The rescue plan was used to inject USD 250 billion into the US banking system in mid-October, following similar moves by other governments.

In November, the US Treasury announced changes to the Troubled Asset Relief Program. Plans to buy assets were abandoned, with the focus switching instead to bank recapitalisation and the support of securitised products markets. With that aim, the Federal Reserve pledged a further USD 600 billion for the purchase of the direct obligations of GSEs and mortgage-backed securities underwritten by them. A further USD 200 billion was provided for the new term asset-backed loan facility, to support the market for securitised car, credit card, student and small business loans.

In mid-September, the Federal Reserve proposed an additional new policy that would give investors, including private-equity firms, stakes of up to 33% in bank holding companies, to assist US banks in raising capital. The Federal Reserve also widened the collateral it accepts under its Primary Dealer Credit Facility and expanded its Term Securities Lending Facility, as well as holding various US dollar auctions in coordination with central banks of major industrialised countries, including the ECB. In early October, as the crisis intensified, the Federal Reserve and

10 The aid packages consisted of an extra USD 20 billion capital injection (on top of USD 25 billion already provided) and partial guarantees on USD 306 billion of Citigroup's MBSs and other assets.

11 See, for example, Deutsche Bank, "An overview of bank rescues", *Fixed Income Special Report*, October 2008.

central banks from the United Kingdom, China, Canada, Sweden and Switzerland, as well as the ECB, agreed on coordinated interest rate cuts (see also Section 3).

The SEC, too, took action by temporarily banning the short-selling of financial stocks in order to stave off downward price speculation. However, this move increased losses, especially within the hedge fund industry. This in turn affected a range of investors, including pension funds and endowments, which had invested in hedge funds. It may also further reduce banks' trading revenues from prime brokerage. Similarly, the United Kingdom's Financial Services Authority (FSA), the Swiss stock exchange and various EU stock exchanges banned uncovered short sales.

In the United Kingdom, the government announced a bank rescue package of around GBP 500 billion, comprising three parts, on 8 October. First, it would make GBP 200 billion available to the banks under the Bank of England's Special Liquidity scheme. Second, the government would support eight major banks in raising capital in the order of GBP 25 billion and stand ready to provide another GBP 25 billion. Third, the government would temporarily guarantee loans between UK banks for up to GBP 250 billion. Parts of this plan were subsequently adopted by other European and US authorities (see also Special Feature A and Section 4.1).

In Switzerland, UBS received government assistance in the amount of CHF 6 billion, and the Swiss National Bank would moreover buy troubled assets in the amount of USD 60 billion.

The private sector likewise took action after Lehman Brothers' demise. A consortium of ten global banks agreed to provide a financial backstop by establishing a collateralised borrowing facility for USD 70 billion, with increases possible if further banks joined. All participating banks would be able to borrow from the facility, and no single bank would be able to take up more than one-third of the available funds.

These actions by governments, supervisors and central banks are widely seen as beneficial, as they address liquidity concerns, by providing a backstop for customer deposits and guaranteeing wholesale funding, and make it easier for banks to recapitalise. This helped to bring down both banks' CDS spreads and interbank rates. However, financial market stress, notably US dollar funding and stock prices, as well as CDS and interbank spreads, remain at exceptionally high levels, as documented in Sections 1.2, 3 and 4.

MAJOR GLOBAL INSURERS

The financial condition of some global insurers domiciled outside the euro area can be important for the stability of the euro area financial system, mainly because of their importance as large asset managers with the potential to affect financial markets, their underwriting of credit insurance and because of their presence as underwriters in the euro area insurance markets.

Some global insurers continued to report large losses after the finalisation of the June 2008 FSR, in particular due to their insurance underwriting of credit and structured credit products.

In particular, the risks confronting the US insurer AIG, which had been highlighted in the June 2008 FSR, materialised. Losses on CDSs written by AIG's London-based Financial Products unit – whose trades were routed through the French institution Banque AIG – contributed to a loss of USD 5.4 billion for AIG in the second quarter of 2008 and a USD 24.5 billion loss in the third quarter. These troubles led to rating downgrades in September, which forced the insurer to post collateral payments on derivatives trades. AIG was unable to raise enough capital to satisfy demands for collateral quickly enough, which resulted in the Federal Reserve Bank of New York offering AIG a two-year loan of up to USD 85 billion to give the ailing insurer the opportunity to sell some of its assets in an orderly fashion. In return, the US government received an equity interest of 79.9% in AIG. In addition, at the beginning of October, the Federal Reserve agreed to provide additional

liquidity of up to USD 37.8 billion to help fund AIG's securities lending operations. These state aid packages were revised in early November when it was announced that the two-year USD 85 billion loan would be swapped into a five-year USD 60 billion loan together with a USD 40 billion purchase of preferred shares by the government. In addition, the USD 37.8 billion liquidity facility was replaced by two new lending facilities amounting to USD 52.5 billion established by the New York Fed, designed to alleviate capital and liquidity pressures on AIG associated with two distinct portfolios of mortgage-related securities.

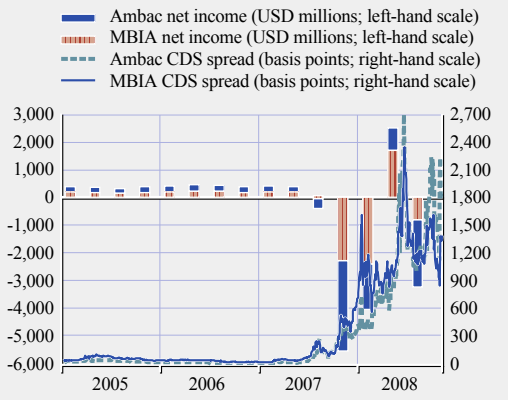
AIG's large exposures to structured credit products are not representative of the exposures of the global insurance sector as whole, as most insurers do not have financial product units like AIG's. However, some other major insurers have reported losses due to the challenging capital market conditions, and further problems for some global insurers cannot, therefore, be excluded. Furthermore, US mortgage insurers continue to be exposed to the risk of further falls in US house prices.

In addition, the outlook for "monoline" financial guarantors remains uncertain.[12] Most financial guarantors suffered large mark-to-market losses in the last two quarters of 2007 and the first quarter of 2008 (see Chart 1.28). However, at the beginning of August, some financial guarantors reported record incomes for the second quarter of 2008, thanks to the enactment of an accounting rule that allows financial firms to report gains when the fair value of their liabilities fall.[13] The widening of the institutions' own credit spreads thus had a positive impact on their profit-and-loss statements (see Chart 1.28).

The favourable mark-to-market impact of this accounting rule on guarantors' results was, however, seen as credit neutral by rating agencies. Large losses were again reported in the third quarter of 2008 after the continued problems in credit markets forced the guarantors to increase reserves for claims. This, together with the limited underwriting of new structured credit product insurance and guarantors' reduced capital buffers therefore resulted in several of them having their ratings downgraded during the last six months. This led to rating downgrades of securities insured by the guarantors, which caused further mark-to-market losses for institutions, often banks that had bought credit protection (see also Sections 1.3 and 4). The fact that some larger financial guarantors were not downgraded earlier on during the credit market turmoil did, however, give institutions some time to diversify and to unwind some of their exposures.

Chart 1.28 Net income and five-year senior credit default swap (CDS) spreads for Ambac and MBIA

(Jan. 2005 – Nov. 2008)



Source: Bloomberg.

All in all, the outlook for financial guarantors and some other major global insurers remains uncertain as financial conditions have worsened and risks remain. The outlook depends chiefly on the outlook for structured credit markets, and on the insurers' ability to attract new business and to generate investment income. The effects on structured credit markets (see Section 3.2) and financial institutions (see Section 4) – and, thereby, for euro area financial stability – could be significant if the problems some global insurers currently face remain or, indeed, worsen.

12 For a discussion of the business model of financial guarantors, see Box 4 in ECB, *Financial Stability Review*, June 2008.

13 See Financial Accounting Standards Board, "Summary of Statement No 157 – Fair Value Measurements", available at www.fasb.org.

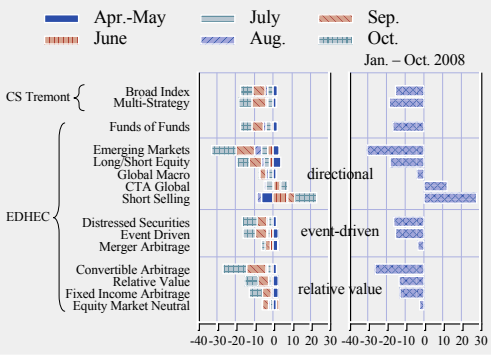
HEDGE FUNDS

After the turbulent first quarter of 2008 and a short-lived recovery in April and May, average hedge fund investment performance results deteriorated again amid prolonged and heightened volatility in the world financial markets (Chart 1.29). In July 2008, for example, many hedge funds were reportedly hit by a combination of falling commodity prices and rising financial stock prices, since they had popular positions in opposite directions. Moreover, in September major bank-related problems and short-selling restrictions had an adverse impact on hedge funds' investment returns, which continued in October amid widespread falls in the prices of various financial assets. As a result, many hedge funds were caught in, and contributed to, a vicious downward spiral of falling prices and forced selling that was also reinforced by large investor redemptions.

Despite weak performance, broad hedge funds' indices, however, still indicated better cumulative return performances than those of major stock market indices, although it has also to be noted that negative year-to-date returns do not square well with the hedge funds' objective of positive absolute returns in all market conditions.

Chart 1.29 Global hedge fund returns in 2008

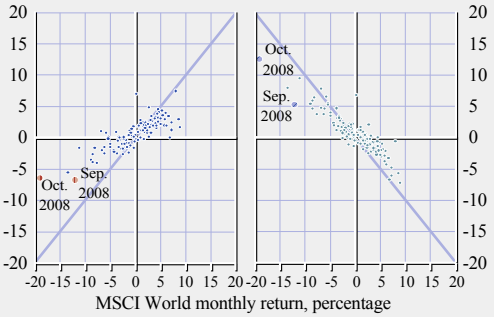
(Jan. – Oct. 2008; percentage monthly and cumulative year-to-date returns, net of all fees, in USD)



Sources: Credit Suisse Tremont index and EDHEC Risk and Asset Management Research Centre.
Note: EDHEC indices represent the first component of a principal component analysis of similar indices from major hedge fund return index families.

Chart 1.30 Call option-like returns of long/short equity hedge funds globally

(Jan. 1997 – Oct. 2008; percentage monthly hedge fund returns, net of all fees, and MSCI World returns, both in USD)



Sources: Datastream and EDHEC Risk and Asset Management Research Centre.
Note: EDHEC Long/Short Equity Index represents the first component of a principal component analysis of long/short equity hedge fund return indices compiled by major index providers.

As illustrated in the left-hand panel of Chart 1.30, the return profile of hedge funds can often resemble that of a call option on a relevant broad market index. However, reduced downside risk seems to come at a cost of diminished returns on the upside (see the right panel of Chart 1.30), partly also as a result of the accounting of performance fees.[14] Since a higher positive return is needed to recover any given loss,[15] this market loss-reduction feature outweighs relative underperformance on the upside, at least in the case of long/short equity hedge funds, and thereby contributes to higher cumulative returns over longer periods of time. Far from being positive in all market conditions, such call option-like returns are nevertheless also beneficial to investors and may represent a more realistic expectation of what a good hedge fund manager could accomplish.

14 Throughout a year, performance fees accrue to the hedge fund managers after good investment performance results, but are given back to the fund if cumulative returns deteriorate, become negative, fall below a high-watermark or a hurdle rate. As a result, performance fees tend to make net returns lower than gross returns on the upside, but higher on the downside, thereby also reducing the relative volatility of net returns.

15 For example, a value loss of 20% from 100 to 80 requires a 25% gain to restore the initial value of 100.

Exposures and leverage

In times of stress, in order to achieve at least call option-like returns, some hedge fund managers may choose to reduce risk-taking and instead concentrate on capital preservation. This seems to be precisely what many managers have been doing since the start of the recent turmoil (see Chart 1.31), either voluntarily or due to cuts in the financing extended by banks. The reduced availability of leverage notwithstanding, such cautious attitudes of hedge fund managers, even if probably justified at a fund level, are detrimental to the functioning of financial markets, since they imply asset sales and deprive markets of their most active participants.

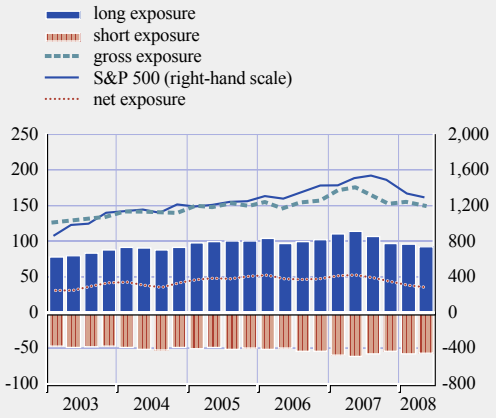
Chart 1.32 provides further evidence of a rapid and widespread deleveraging in the hedge fund sector. The share of surveyed hedge funds reporting that they were leveraged less than one time (i.e. that their gross investments did not exceed capital) reached record levels in September and October 2008, suggesting that many hedge funds reallocated investments to cash-equivalent and less risky assets, which has also been confirmed by market intelligence. Moreover, such portfolio shifts were also intensified by mounting and expected redemption requests from investors.

However, the near-failure of Bear Stearns and the bankruptcy of Lehman Brothers highlighted for hedge funds the importance of monitoring the security of the cash and security balances held with prime brokers. After the Bear Stearns episode, many hedge funds became increasingly concerned about their counterparty exposures and have reportedly requested prime brokers to move their assets to segregated client accounts, despite the lower returns on free balances in such accounts. The segregation of a hedge fund's collateral prevents the prime broker from re-using that collateral for its own cash-raising operations in a practice known as rehypothecation.

Some hedge funds that were Lehman Brothers clients and had not withdrawn or segregated their assets before the prime broker's bankruptcy reportedly found that they had become general creditors. Moreover, even the segregated assets were not made immediately available to hedge fund clients, thereby complicating

Chart 1.31 Exposures of long/short equity hedge funds

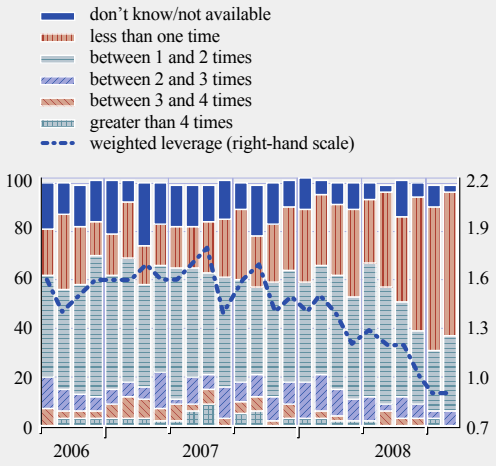
(Q1 2003 – Q2 2008; average of exposures as a percentage of capital under management and S&P 500 index levels)



Source: Hennessee Group.
Note: Based upon analysis of 100 long/short equity hedge fund managers. Gross exposure equals to the sum of absolute long and short equity exposures.

Chart 1.32 Hedge fund leverage

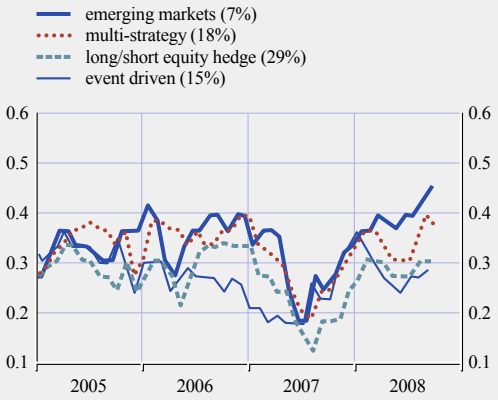
(Sep. 2006 – Oct. 2008; percentage of responses and weighted average leverage)



Sources: Merrill Lynch, *Global Fund Manager Survey*.
Notes: Leverage is defined as a ratio of gross assets to capital. The number of responses varied from 32 to 45.

Chart 1.33 Medians of pair-wise correlation coefficients of monthly global hedge fund returns within strategies

(Jan. 2005 – Sep. 2008; Kendall's τ_b correlation coefficient; monthly returns, net of all fees, in USD; moving 12-month window)



Sources: Lipper TASS database, Lipper TASS and ECB calculations.
Notes: Numbers in brackets after strategy names indicate the share of total capital under management (excluding funds of hedge funds) at the end of June 2008, as reported by Lipper TASS. If, instead of one fund or sub-fund, several sub-fund structures were listed in the database, their weighted average monthly return in US dollars was used. Sub-fund structures typically represent onshore and offshore versions or different classes of shares (usually differing in currency denomination) that basically correspond to the same pool of money managed in a highly correlated or nearly identical way.

the management of affected funds. Thus, counterparty risk-related issues, associated changes in dealing relationships and other trading frictions were important impediments to the operations of many hedge funds.

The severity of the negative implications of short-selling restrictions that were introduced by regulators in a number of countries in late September 2008 for the activities of hedge funds are difficult to assess, not least because of the lack of full clarity on their scope and duration. Whereas the ban on so-called naked short sales was likely to become permanent, at least in the United States,[16] the ultimate duration of the constraints imposed on the short-selling of financial stocks remained uncertain and complicated hedge funds' hedging needs, particularly in the case of certain arbitrage (relative value) investment strategies. However, hedge funds reportedly quickly switched to other less direct, but often riskier ways of expressing their negative views on financial institutions by way of, for example, credit default swaps, put options or by shorting stock index futures and buying shares of non-financial companies.

The similarity of hedge fund investment exposures and the associated risk of an abrupt collective exit from crowded trades can be estimated by using correlations across individual hedge fund returns within various hedge fund investment strategies. After the finalisation of the June 2008 FSR, the moving median pair-wise correlation coefficients of some of the more popular investment strategies shown in Chart 1.33 increased, not least because of funding liquidity pressures resulting from cuts in bank financing and investors' withdrawals and the fact that broad-based and often correlated changes in various asset prices made differences across hedge funds' investment portfolios less relevant.

Funding liquidity risk and liquidations

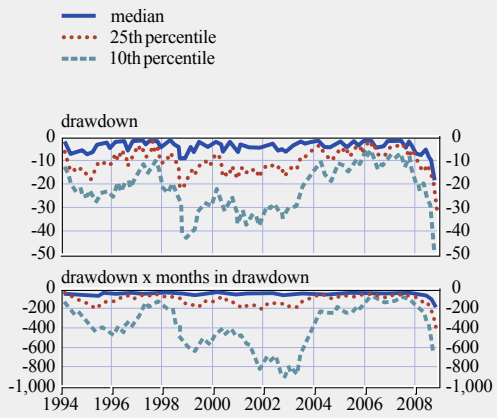
Given the lower levels of leverage across hedge funds and the limited willingness of banks to supply financing, hedge funds were probably less vulnerable to funding liquidity pressures that could arise due to margin calls on outstanding transactions, changes in margin terms or a non-renewal of existing funding. However, given their own problems, banks may be much more likely to act promptly at the first sign of weakness.

Another source of funding liquidity risk is associated with investor redemptions and posed a serious threat to the survival of many hedge funds for a number of reasons. First, investors' aggregate net flows slowed down significantly (see Chart S15). Second, more sub-sectors experienced net outflows. Third, smaller hedge funds were particularly vulnerable, since market participants reportedly observed an increased preference by investors to reallocate their funds to larger hedge funds that could afford and prove

16 In an uncovered (naked) short sale, the seller does not actually pre-borrow the security.

Chart 1.34 Distribution of hedge fund drawdowns globally

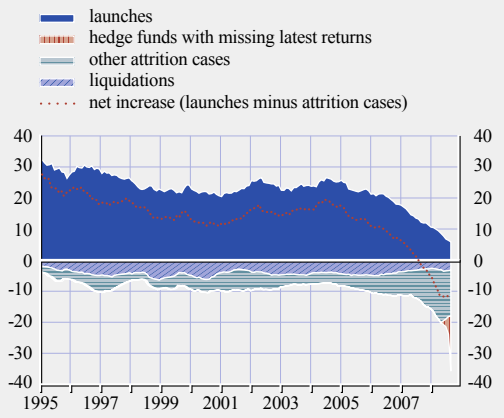
(Jan. 1994 – Oct. 2008; percentage of monthly returns, net of all fees, in fund's reporting currency)



Sources: Lipper TASS database and ECB calculations.
Note: The drawdown indicator refers to the cumulative percentage decline from the latest historical performance peak of a hedge fund as measured by net asset value per participation unit. Excluding funds of hedge funds. 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.

Chart 1.35 Global hedge fund launch, liquidation and attrition rates

(Jan. 1995 – Oct. 2008; 12-month moving sum and the number of funds with missing latest returns as a percentage of funds existing 12 months previously)



Sources: Lipper TASS database and ECB calculations.
Note: Excluding funds of hedge funds. If, instead of one fund or sub-fund, several sub-fund structures were listed in the database, each of them was analysed independently. In the database, cases of attrition are classified as follows: liquidated, no longer reporting, unable to contact, closed to new investment, merged into another entity, fund dormant, unknown. Cases of liquidation or other attrition are assumed to have taken place during the month following last reported returns. They were identified based on the attrition code only. Therefore, attrition data, particularly the most recent information, should be interpreted cautiously. In addition, the most recent data are subject to incomplete reporting.

adequate risk controls and reliable operational infrastructures.

The acuteness of investor redemption risk resulted in a higher number of cases where managers had to activate gate provisions that limit withdrawals per month (quarter) as a proportion of the capital under management, or in an increasing preparedness of hedge fund managers to offer lower fees in exchange for longer lock-up periods. Nevertheless, at the end of October, many hedge funds remained confronted with substantial drawdowns relative to their previous cumulative performance peaks (see Chart 1.34) and, therefore, investors' anxiety is set only to increase in the near term, unless hedge funds' investment returns improve.

Information available in one commercial hedge fund database confirms a rather gloomy picture of the state of the hedge fund sector, since the hedge fund attrition rates from the database have recently increased substantially. At the same time, there were fewer hedge funds that joined the database and had an inception date within the last couple of years (see Chart 1.35). After the June 2008 FSR was finalised, there were several large hedge fund failures, but none of them had systemic implications, partly on account of the tighter credit terms applied by banks.

To sum up, in the period ahead, the main challenges faced by most hedge funds will be investment performance results and the retention of dissatisfied investors. Since leverage levels did not appear to be high, the likelihood of further deleveraging is rather low. However, further sizeable position unwindings by hedge funds due to probable higher investor redemptions and more frequent cases of hedge fund liquidation may pose a challenge to financial markets.

2 THE EURO AREA ENVIRONMENT

The overall macroeconomic environment in the euro area has deteriorated further over the last six months. While the balance sheet conditions of firms generally remained sound, vulnerabilities are on the rise. Lower earning expectations and higher financing costs for a considerably leveraged corporate sector have increased firms' financial fragility and are likely to contribute to rising defaults. Higher funding costs, coupled with falling commercial property prices in some markets, have also led to a deterioration of the prospects for the euro area corporate sector, which is traditionally dependent on bank lending. Although risks to indebted households remain contained, they have increased on account both of rising income risks and of risks stemming from residential property markets. In a few euro area countries, price inflation began to decelerate in the second half of 2008 thereby mitigating risks related to potential overvaluation. Nevertheless, these vulnerabilities could translate into the risk of a deeper and more prolonged slowdown in the economy that could exacerbate a credit cycle downturn. In particular, the longer bank funding costs remain high, and the more that banks respond to this by deleveraging or passing on the costs to borrowers, the greater becomes the risk of an adverse feed-back loop to the euro area real economy.

2.1 ECONOMIC OUTLOOK AND RISKS

Economic activity in the euro area has slowed further since the finalisation of the June 2008 FSR. In the second half of 2008, developments in economic activity remained surrounded by an extra ordinarily high degree of uncertainty. This was to a large extent stemming from the intensification and broadening of the financial market turmoil, especially towards the last quarter of the year.

Euro area real GDP in the third quarter of 2008 fell by 0.2% in comparison with the previous quarter and, expressed in annual terms, the growth rate was 1.4%, a major moderation compared to the pace observed at the end of 2006 (3.3% in annual terms). The slowdown in the euro area reflects both a decline in private consumption growth – visible since the last months of 2007 – and the most recent moderation in investment growth (observed since the second quarter of 2008). The negative trend in domestic demand growth unfolded simultaneously with a sharp decline in exports, mainly reflecting the weakening of demand from advanced economies.

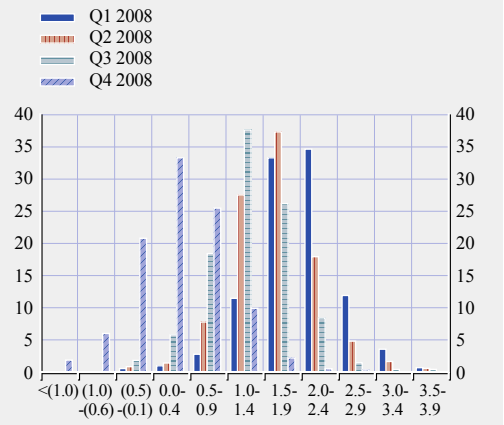
The weakness of economic activity in the euro area is likely to persist in 2009. Since the finalisation of the last FSR, the outlook presented in the ECB / Eurosystem staff macroeconomic projections has been revised downwards considerably both in September and December 2008.[1] The December projections point to an annual real GDP growth of between 0.8% and 1.2% in 2008, between -1.0% and 0.0% in 2009, and between 0.5% and 1.5% in 2010. The outlook incorporates a further slowdown in household consumption growth, given the rising concerns about employment and the end of the wealth effect derived from past increases in house prices. Investment – in terms of both residential investment and non-residential private investment – is also expected to remain subdued, mostly on account of the weaker results of non-financial corporations and the tighter financing conditions.

Private sector forecasters have revised their estimates of real GDP growth for the period 2008-10 sharply downwards. In particular, estimates from the Survey of Professional Forecasters (SPF) point to 1.2% growth in 2008, down from the 1.6% estimated in the previous quarter. The biggest downward revision relates to 2009, when real GDP is expected to grow by a mere 0.3%, down from the 1.3% estimated in the previous quarter (see Chart 2.1). This is the largest revision since the launch of the SPF in 1999. The current financial market developments and their impact on economic

1 The December 2008 ECB/Eurosystem staff macroeconomic projections were published on 4 December 2008, after the cut-off date for this issue of the FSR.

Chart 2.1 Probability distribution of euro area GDP growth in 2009

(percentage)



Source: ECB Survey of Professional Forecasters.

activity are the factors behind this large revision. For the first time, respondents to the ECB's survey have provided a forecast for real GDP in the following year, which puts growth in 2010 at 1.4%.

The economic outlook is subject to increased downside risks, which mainly stem from a scenario of ongoing financial market tensions affecting the real economy more adversely than currently anticipated. Other downside risks relate to the possibility of disorderly developments as a result of global imbalances and rising protectionist pressures.

The further worsening of the macro-financial economic environment in the euro area since the finalisation of the June FSR translates into an increase in risks to financial stability. These developments may directly impair the ability of households and companies to honour their financial obligations, thereby potentially increasing banks' credit losses. More importantly, should funding costs for banks remain high and induce banks to constrain the provision of credit or to pass on the costs to borrowers, the risk of an adverse feed-back loop along the lines of a more traditional credit-cycle downturn could materialise.

2.2 BALANCE SHEET CONDITIONS OF NON-FINANCIAL CORPORATIONS

Since the finalisation of the June 2008 issue of the FSR, euro area firms' balance sheets have shown continued resilience to the challenging environment they have been operating in. In particular, the failure of a number of large financial institutions and growing credit crunch concerns in the United States have not, at the time of writing, had significant spillover effects to the euro area non-financial corporate sector, even though the impact is likely to arrive with a lag.

Going forward, the overall risks for the corporate sector, however, seem to be strongly tilted towards a deterioration of balance sheets in the near term. There are three core indicators supporting such an assessment. First, the euro area corporate sector's profitability will most probably continue to slow down after the exceptionally strong earnings growth in the past few years. Second, the leverage levels among euro area corporations are high. Historical evidence shows that leveraged firms' balance sheets tend to be more vulnerable to macroeconomic stress than those of less indebted firms. Third, higher bank lending rates, coupled with potential supply constraints in the banking system, are likely to contribute to more difficult funding conditions for the corporate sector.

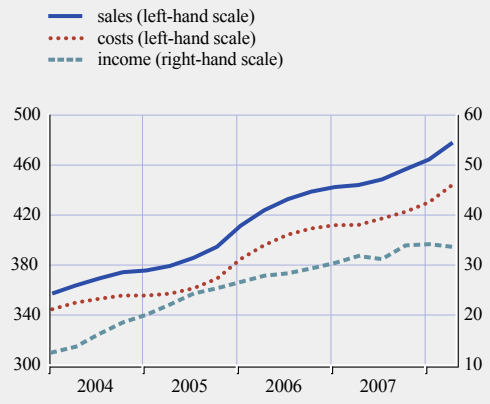
If these three vulnerabilities were to crystallise, they could result in heightened systemic risks for the euro area economy. While the next sub-section on the earnings outlook discusses the risks that stem from the assets side of firms' balance sheets, the following one – on leverage and financing costs – focuses on those stemming from firms' liabilities.

EARNINGS OUTLOOK

A closer look at firms' ability to generate internal funding is a natural starting point for an assessment of the overall health of their balance sheets. Everything else being equal, the stronger the firms' earnings situation is, the less dependent they are on external financing.

Chart 2.2 Costs, sales and profits of large listed non-financial firms in the euro area

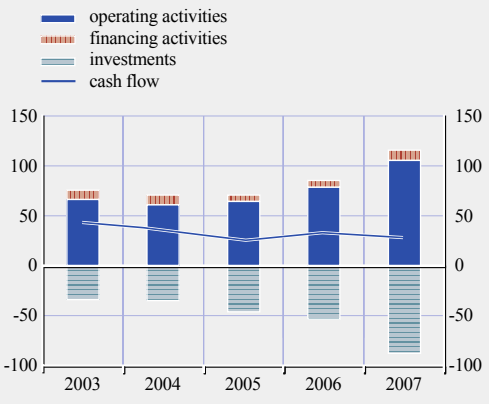
(Q1 2004 – Q2 2008; EUR billions; four-quarter moving average)



Sources: Thomson Financial Datastream and ECB calculations.
Note: The data cover around 60% of the non-financial corporations included in the broad-based Dow Jones EURO STOXX index.

Chart 2.3 Investment, financing and operating activities of non-financial firms in the euro area

(2003 – 2007; EUR billions)



Sources: Thomson Financial Datastream and ECB calculations.

The annual growth rate of earnings per share for the non-financial firms listed on the Dow Jones EURO STOXX index was -3% in November 2008, considerably below the rate of 10% recorded at the time of the finalisation of the June 2008 FSR (see Chart S52). Among the non-financial sectors, the healthcare and technology sectors experienced negative earnings growth in the third quarter of 2008.

An alternative way of measuring earnings is to gauge the profitability of a balanced sample of firms. This makes a comparison of the level of profits possible over time. In addition, earnings measures derived from this balance-sheet approach also permit sales and cost measures to be imputed. Earnings (as measured by net income) stabilised in the second quarter of 2008, driven by high, roughly equal increases in sales and costs (see Chart 2.2).

By November 2008, analysts expected corporations' earnings to grow at an annual rate of around 3% over the next 12 months. Based on historical experience, however, analysts have been over-optimistic in their earnings forecasts over time. In fact, the combination of higher financing costs, some credit supply constraints and the sharp slowdown in expected economic growth does not bode well for firms' profitability. Thus, risks seem to be tilted towards significantly lower corporate earnings growth in 2009.

Another important dimension concerning firms' internal funds is their ability to pay short-term debt obligations. Indeed the above-mentioned earnings measures can potentially be somewhat misleading as they are intended to capture the resources earned and the resources used over an accounting period (quarterly or annually). This (accounting) definition ignores the timing of cash receipts when recognising revenues, as well as the timing of cash expenditures when recognising losses. In order to provide a broader overview, firms usually present a cash-flow statement in addition to the profit and loss account. As a result, firms can, in principle, show robust income growth, but have little cash at their disposal. This can have major implications for financial stability in the current environment since a low cash flow for euro area corporations can signal that they are particularly vulnerable to further shocks.

Euro area firms' overall cash flows remained broadly unchanged over the period from 2003 to 2007 (see Chart 2.3). As a result, the turmoil that began in the summer months of last year

seemed to have had little impact on firms' net cash flow, at least up to the end of 2007. In 2008, this favourable cash-flow situation for firms has probably deteriorated on account of the tightening of financing conditions and the slowdown in economic growth.

RISKS FACING LEVERAGED COMPANIES

Firms' leverage plays a crucial role for financial stability because high leverage can aggravate economic business cycles. In particular, history has shown that sharp increases in asset prices tend to be associated with excess leverage on the part of private investors, banks and firms. When asset prices are eventually corrected, a rapid deleveraging and increases in firms' default rates usually follow, resulting in heightened risks for the financial system.

In the euro area, firms' indebtedness increased at a relatively rapid pace in the years from 2004 to 2006 (see Charts S50 and S51). Improved economic growth prospects and a surge in merger and acquisition (M&A) activities fuelled this development. At the same time, firms' debt funding costs (either when firms tapped the banking system for funds or, alternatively, when they chose to seek funds directly in the markets) hovered at very favourable levels.

The continued widening of firms' financing gaps in 2007 and 2008, coupled with still resilient bank lending growth, suggests that the period of financial market turmoil has done little to interrupt the upward trend in euro area firms' leverage. Going forward, as economic growth slows down and profits decline, firms will probably need to diminish their indebtedness. Should such deleveraging take place in a disorderly fashion, it could trigger further investor uncertainty about firms' market values, which would, in turn, cause their default probabilities to rise.

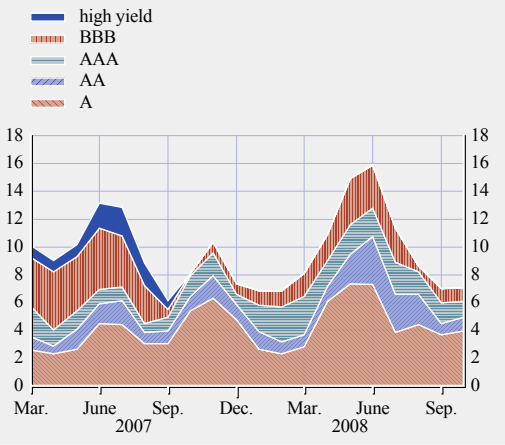
Estimations carried out by private entities suggest that the default rates for European firms will rise from a level of around 1% recorded in October 2008, to nearly 10% over the following 12 months (see Chart S53). Although all predictions should be interpreted with some caution, there are worrying signs of deteriorating credit standards for euro area firms. This is evident from the fact that issuance activities have declined sharply throughout the period of turmoil.

The sustained level of bank lending in the first half of 2008 may have reflected an increased drawing of credit lines granted by banks at generous conditions before the turmoil erupted. Coupled with a rise in the relative cost of alternative market sources of financing, the recourse to contingent credit facilities may to some extent have explained the resilience of bank lending growth. Going forward, the moderation in bank lending growth is expected to soon become apparent in data for the fourth quarter of 2008, as a lagged reaction to the ongoing instability in financial systems and the slowdown in economic activity. The problems of seeking market-based finance seem particularly marked for firms at the lower end of the spectrum of creditworthiness: issuance activities of firms included in the high-yield segment had basically dried up by late 2008, also reflecting the collapse of the structured credit markets, (see Chart 2.4).

Data on the ratings of firms suggest that euro area firms are generally experiencing problems in meeting their debt obligations (see Chart S54).

Chart 2.4 Gross bond issuance by non-financial corporations in the euro area

(Mar. 2007 – Oct. 2008; EUR billions; three-month moving average)



Source: Dealogic and ECB calculations.

By late 2008, a larger number of euro area non-financial corporations had been downgraded than had been upgraded.

Developments in the cost of finance in the second half of 2008 suggest more problematic funding conditions for euro area non-financial firms. The overall real cost of finance rose to 5% in September 2008, which was 60 basis points higher than the 4.4% recorded in May (see Chart S49).

The bulk of euro area firms' external financing is tapped through the banking system. Survey-based indicators, such as the ECB bank lending survey (discussed in more detail in Section 4.2), provide further evidence that the bank funding situation has gradually become less favourable since the previous issue of the FSR. In the October 2008 bank lending survey, banks continued to report a significant net tightening of credit standards for loans to enterprises. The most important factors driving the net tightening continued to be banks' risk perceptions regarding general economic activity and the industry or firm-specific outlook. In case the reductions in short-term interest rates are not passed on to bank lending rates, the increase in lending rates since mid-2007, coupled with tighter bank lending standards, is likely to contribute to a more difficult funding situation for the corporate sector.

OVERALL ASSESSMENT OF RISKS IN THE CORPORATE SECTOR

While the balance sheet conditions of euro area firms are generally stronger than they were at the time just before the last credit cycle downturn, their operating environment looks less favourable than six months ago. Slowing economic growth is likely to weigh on firms' ability to generate internal funds at a time when their external funding conditions have become more difficult. At the same time, euro area firms' indebtedness has continued to increase throughout the turmoil, making firms less resilient to further shocks. Looking ahead, the balance of risks thus appears to be tilted towards some deterioration in the condition of corporate balance sheets in the near term.

2.3 COMMERCIAL PROPERTY MARKETS

Commercial property market developments are important from a financial stability perspective for several reasons, the most important being that loans for the development and ownership of commercial property are often an important component of the assets of financial institutions.[2]

DEVELOPMENTS IN COMMERCIAL PROPERTY MARKETS

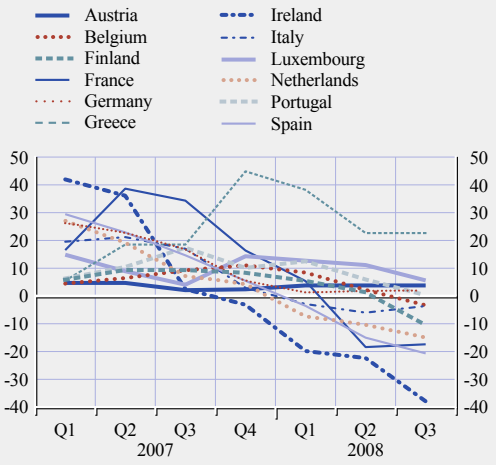
Information that has become available since the finalisation of the June 2008 FSR shows that the decline in commercial property inflation rates in most euro area countries in 2007 continued in the first three quarters of 2008, with prices even falling in many countries (see Chart 2.5).

Prices were affected by lower demand and higher funding costs which reduced

2 For a discussion of the importance of commercial property markets from a financial stability perspective, see ECB, "Commercial property investment and financial stability", *Financial Stability Review*, December 2007.

Chart 2.5 Prime commercial property capital value changes in euro area countries

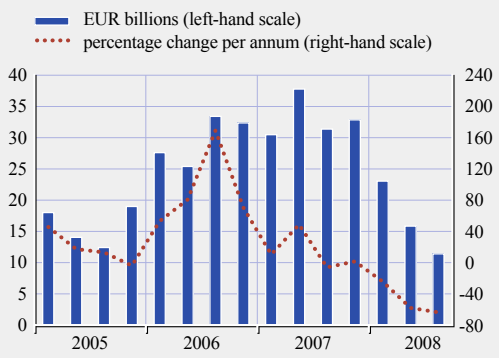
(Q1 2007 – Q3 2008; percentage change per annum)



Source: Jones Lang LaSalle.
Note: Data for Cyprus, Malta and Slovenia are not available.

Chart 2.6 Direct commercial property investment volumes in the euro area

(Q1 2005 – Q3 2008)



Source: Jones Lang LaSalle.
Note: Data for Cyprus, Malta and Slovenia are not available.

commercial property investment activity in the latter part of 2007 and thus far in 2008 (see Chart 2.6). Investment volumes declined by 63% in the third quarter of 2008 compared with the same quarter the previous year, although there were wide variations across euro area countries.

Although commercial property investment activity has been slowing in the euro area, some property investors (such as property funds, insurance companies and pension funds) are reported to have capital for this purpose, but to be waiting for the markets to bottom out before deploying it.

RISKS FACING COMMERCIAL PROPERTY INVESTORS

Commercial property investors typically face two types of risks: first, they bear income risks if vacancy rates increase, rents decrease or prices fall and, second, they are exposed to funding risks due to the availability and cost of debt if, for example, interest rates increase, banks tighten lending standards or demand for corporate bonds decreases.

Income risks have increased for many commercial property investors since the finalisation of the June 2008 FSR, mainly due to falling property prices in some countries and segments. Falling prices could pose challenges for, in particular, commercial property investors such as property funds that have to sell property to finance redemptions. Falling prices could also lead to the breach of loan covenants (based on e.g. loan-to-value ratios), which could trigger forced sell-offs.

Demand for rented commercial property – which had held up relatively well in 2007 and early 2008 – appears to have fallen, at least in the case of office space, after the finalisation of the June 2008 FSR, thus contributing to a more uncertain income outlook for property owners. Demand was reduced for especially non-prime properties (e.g. non-modernised buildings in less attractive locations).

The growth of rents for prime office space slowed down in the second and third quarters of 2008. In the third quarter, an average increase of about 3% year on year was recorded for a set of 20 large cities in the euro area (the growth rates for the individual cities, however, ranged from -5% to 14%).[3] Vacancy rates remained at rather low levels, namely at around 8%, on average, in the third quarter of 2008, but they are likely to increase in many cities with property developments still in the pipeline. Demand for rented commercial property was probably affected by the slowdown in economic activity, and a further reduction in demand cannot be ruled out amid the deteriorating economic outlook after the finalisation of the June 2008 FSR (see Section 2.1). Furthermore, the continued slowdown in labour market developments in the euro area could also reduce the demand for rented property (see Section 2.4).

Funding costs and risks have increased since the finalisation of the June 2008 FSR (see also Section 2.2), which has increased costs for leveraged property investors and has, in turn, been behind much of the decline in price increases, or the price falls, seen in some markets. Banks have tightened lending standards for commercial property loans and some banks' willingness

3 See Jones Lang LaSalle, "Key Rental Market Indicators Q3 2008", 2008.

to lend for commercial property investment and development has also been reduced as a result of the market for commercial mortgage-backed securities (CMBSs) having dried up (see Section 3.2). Higher costs for issuing debt and equity have also increased the funding costs for commercial property companies. As reported in the June 2008 FSR, higher funding costs have to some extent shifted demand from leveraged investors, who were behind much of the investment in recent years, to equity investors such as insurance companies and pension funds.

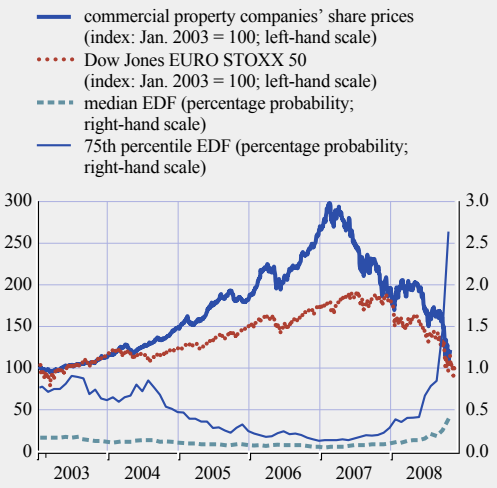
OUTLOOK FOR COMMERCIAL PROPERTY COMPANIES ON THE BASIS OF MARKET INDICATORS

Developments in the market indicators for commercial property companies after the finalisation of the June 2008 FSR suggest that the outlook for the sector remains uncertain and has deteriorated further. Share prices of companies owning, and engaged in trading and development of, income-producing property have performed less well than the overall stock market since May 2008, and the gains relative to the overall stock market witnessed between 2004 and early 2007 have now been erased (see Chart 2.7).

In addition, the expected default frequencies (EDFs) of euro area commercial property companies have been rising since mid-2007 – in particular those for the weaker companies (see Chart 2.7) – and currently stand at levels last seen in the 1990s.

Chart 2.7 Expected default frequencies (EDFs) and share prices of euro area commercial property companies and the Dow Jones EURO STOXX 50 index

(Jan. 2003 – Nov. 2008)



Sources: Bloomberg, Moody's KMV and ECB calculations.
Note: The euro area FTSE EPRA/NAREIT property index includes traded shares of closed-end companies engaged in the ownership of, trading in, and the development of, income-producing real estate. The EDF provides an estimate of the probability of default over the following year. Due to measurement considerations, the EDF values are restricted by Moody's KMV to the interval between 0.01% and 35%.

OVERALL ASSESSMENT OF RISKS IN COMMERCIAL PROPERTY MARKETS

The overall outlook for some euro area commercial property markets remains uncertain, and the risks and vulnerabilities in the markets identified in previous FSRs have increased and continued to materialise. Stabilising or, in some cases, falling property prices and higher funding costs have lowered investor demand and are likely to weaken demand further, especially for non-prime property. Furthermore, the deteriorating economic outlook for the euro area has negatively affected demand for rented commercial property, and is likely to reduce it further. Given the deterioration in some euro area commercial property markets, euro area banks and investors have recorded reduced incomes, or even losses (see Section 4). Further losses are likely if the negative developments in commercial property markets continue.

2.4 BALANCE SHEET CONDITIONS OF THE HOUSEHOLD SECTOR

While household sector indebtedness has shown signs of stabilisation in the six months after the finalisation of the June 2008 FSR, the overall assessment of household sector balance sheets as a potential source of risk from a financial stability perspective has deteriorated since then. Pockets of vulnerability may have grown in euro area mortgage markets – mostly stemming from developments in income and house prices. Nevertheless, the overall risks to financial stability that stem from conditions in the household sector remain contained.

Six months ago, a relatively positive outlook for both the euro area labour market

and household income was expected to counterbalance the rise in short-term interest rates and its impact on the ability of some households to service their debts. However, the developments in the macroeconomic environment in the course of 2008 to date (especially in the second half) are less supportive of household sector balance sheets looking forward.

On the one hand, the pace of household sector borrowing has continued to slow down since June 2008, and has led to a stabilisation of interest payments by households and, more generally, of their level of indebtedness. This can be seen as a positive development. In addition, a gradual deceleration of price increases has continued in a number of euro area housing markets, including France, Spain and Finland, contributing to limiting the risks of overvaluation in residential property markets.

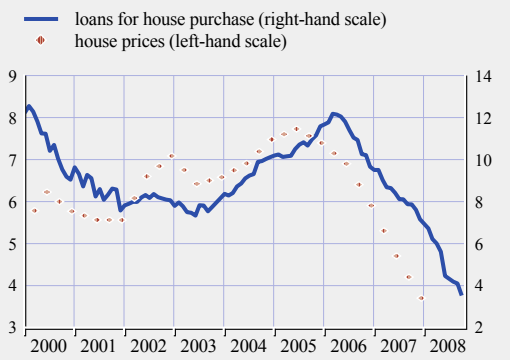
On the other hand, and now turning to the negative side, the risks to financial stability stemming from vulnerabilities associated with income prospects have increased over the last six months. This applies, in particular, to households in those parts of the euro area where the economic slowdown is more marked. In addition, a rapid deceleration of house price inflation in some countries that still show signs of overvaluation may also increase the risks to financial stability in those countries.

HOUSEHOLD SECTOR LEVERAGE

The annual rate of growth in total loans to the household sector declined further to 6.0% in the second quarter of 2008, from 6.8% in the previous quarter. In particular, the annual growth of loans granted by monetary financial institutions (MFIs) to households declined further to 4.0% in the third quarter of 2008. The moderating annual growth of MFI loans to households is mainly attributable to the declining growth rate of borrowing for house purchase, although it is also due to the recently sharp increase in true-sale securitisation activities that reduces the level of loans in bank balance sheets. At the same time, the annual growth rate of consumer credit in the third quarter of 2008 was slightly lower than the average rate of growth recorded in the first half of the year (see Chart S61).

Chart 2.8 Loans for house purchase and house prices in the euro area

(Jan. 2000 – Oct. 2008; percentage change per annum)



Source: ECB.

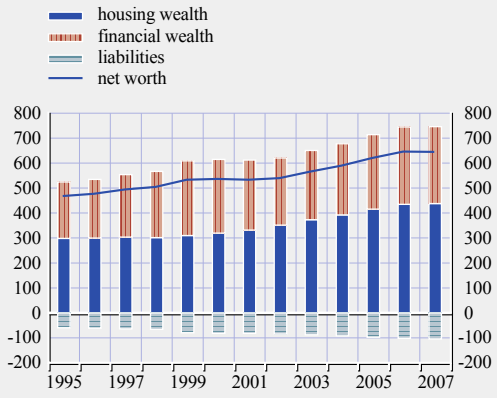
The recent pattern of loan growth, which is in line with long-term patterns, reflects the impact of the increases in bank lending rates since late 2005, the tightening of credit standards, the overall business cycle and the slowdown in the housing market (see Chart 2.8).

Forward-looking information suggests a further slowdown of lending to the household sector, in line with the ongoing moderation in house price growth. According to the results of the October 2008 bank lending survey, a further dampening of households' demand for housing loans is expected on account of worsening housing market prospects and deteriorating consumer confidence.

Reflecting the ongoing deceleration of household sector borrowing in the euro area, the level of indebtedness stabilised at around 60% of GDP in the third quarter of 2008, following a marked increase in previous years (see Chart S63). It is worth recalling in this context that the euro area household sector's debt-to-GDP ratio remains below that recorded in other industrialised countries, such as the United States and the United Kingdom.

Chart 2.9 Household sector net worth in the euro area

(1995 – 2007; percentage of gross disposable income)



Sources: ECB and ECB calculations.
Note: Data for housing wealth after 2003 are based on estimates.

To complete the picture, the holding of assets by households provides an indication of their ability to repay debt at an aggregate level. Until 2007, the value of household assets is estimated to have grown further and to have remained above the value of household debt. However, the pace of increase started to show some deceleration in 2007, and is projected to decline in 2008, mainly on account of developments in financial wealth, due to a downward correction in stock prices. As a result, after remaining broadly stable in 2007 (see Chart 2.9), the net wealth of households is expected to decline somewhat in 2008.

In addition, the higher volatility of household assets relative to that of outstanding liabilities can affect households' ability to repay debt. The fact that the share of housing wealth in total wealth was around 60% for the euro area in 2007 implies a relatively high risk in the event of a strong correction in house prices taking place. Despite the falls in stock prices throughout 2008, which were accompanied by high volatility, the risks from financial assets tend to be comparatively smaller. This is because around 75% of euro area households' financial wealth is estimated to be held in relatively safe assets, such as deposits and insurance products, while financial wealth held in equity and mutual fund shares has recently lost some weight.

RISKS FACING THE HOUSEHOLD SECTOR

Developments in interest rates and income are the two main sources of risk that can affect the ability of households to service their debt. Over the past six months, risks have increased mainly on the income side.

Interest rate risks of households

The steady interest rate rises from December 2005 to July 2008 were followed by interest rate cuts in the last quarter of the year, reflecting lower risks of inflation and addressing the need to ease global monetary conditions amid intensified instability in financial markets. This brought the cumulative rise since December 2005 to positive territory, which, coupled with somewhat robust household borrowing, has led to a slight increase in households' overall debt-servicing burden (although it has recently shown signs of some deceleration). In particular, interest payments represented 3.8% of disposable income in the third quarter of 2008 (see Chart S65).[4]

Two caveats are worth bearing in mind when qualifying developments at the aggregate level. First, not all households hold debt, and borrower characteristics play a role in determining debt sustainability. In particular, the risks affecting the financially most vulnerable segments of the population cannot be properly addressed by looking at aggregate data. In that sense, indebted households at the lower end of the income distribution tend to face higher risk. Second, the impact of rising interest rates on household debt-servicing costs depends on the nature of mortgage contracts. Mortgages at variable rates will lead to a higher interest payment burden after the past increases in interest rates, but only temporarily given the recent and expected declines in interest rates. Again, aggregated data may be misleading because the share of outstanding mortgage debt subject to a variable rate may be relatively low in the euro area as a whole, at around 25%, but it is very high in some individual countries.

4 This can be seen as a lower bound to the debt servicing burden of indebted households, since it is calculated on the basis of total disposable income.

Overall, the interest rate risk faced by households has remained broadly unchanged after the finalisation of the June 2008 FSR. Looking forward, in the short term, interest rates may be affected by ongoing tensions in the money markets that are related to the financial turmoil, while they are expected to decline in the medium term.

Risks to household income

The evolution of household income, which is linked closely to developments in the labour market, is one of the most important predictors of households' ability to meet their debt-servicing obligations.

In comparison with the second half of 2007, the macroeconomic environment has deteriorated in the first half of 2008 in terms of both economic and employment growth. This points to an increase in income-related risks for households. Indeed, the euro area unemployment rate started to increase slightly in the first half of the year, after a steady declining trend since early 2005, and stood at 7.5% in the third quarter of 2008. As a result of the weakening in labour market conditions, real disposable income is expected to remain more subdued than anticipated in the June 2008 FSR.

Survey evidence collected by the European Commission confirms this slowdown, showing a further deterioration in euro area households' expectations with respect to both their financial situation and, albeit to a lesser extent, in their perceptions of future unemployment prospects in 2008 (see Chart 2.10).

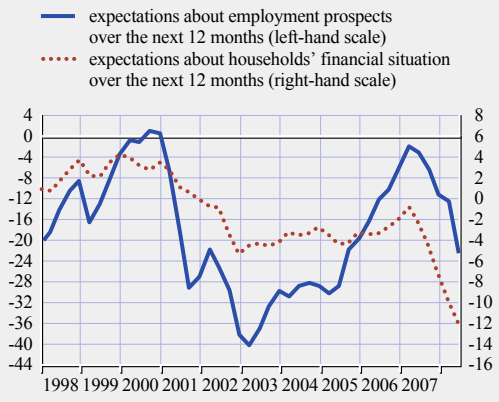
Looking forward, employment growth is expected to be more moderate than previously anticipated, which would very likely translate into a further increase, albeit a small one, in unemployment. At the same time, real income is expected to recover in the near future, although at relatively subdued rates.

Risks to residential property prices

The deceleration of residential property price developments in the euro area as a whole continued in the second half of 2007, with residential property prices increasing just under 4%, compared with close to 5% in the first half of 2007. Indications are that a slowdown in house price inflation will characterise developments in most euro area countries in 2008. Available official country data for the beginning of 2008 point to a continuation of the deceleration trend and confirm its broad-based nature, notwithstanding considerable heterogeneity across countries. In particular, Ireland experienced a fairly rapid drop of 9% in house prices in the first half of 2008. Malta also experienced a decline in house prices in that period. Residential property price increases in Spain, France, the Netherlands and Finland slowed down in the first half of 2008 (see Table S4). These developments are matched with indicators pointing to a cooling-off of demand for residential property, in line with worsened economic conditions and higher financing costs. At the same time, on the residential property supply side, growth in real residential investment continued to moderate in the first half of 2008.

Chart 2.10 Euro area households' financial situation and unemployment expectations

(Q1 1998 – Q3 2008; percentage balances; three-month-moving averages)



Source: European Commission Consumer Survey.
Note: Expectations about unemployment prospects are presented in an inverted scale, i.e. an increase (decrease) in this indicator corresponds to more (less) optimistic expectations.

Despite the observed deceleration of house price inflation ongoing since 2006, crude valuation measures for property prices based on house price-to-rent ratios have continued to provide indications of an overvaluation in the residential property market (see Chart S68), thus exacerbating the risks to financial stability in the event of abrupt corrections in property prices.

Risks are particularly high in those countries where overvaluation appears to be most acute and where the housing market continues to represent a source of risk for household sector balance sheets (see Box 5). More generally, resources freed from the housing sector will have to be reabsorbed elsewhere in the economy, posing additional challenges, especially for employment.

OVERALL ASSESSMENT OF RISKS IN THE HOUSEHOLD SECTOR

Overall, the risks to the euro area financial sector that originate in the household sector, although contained, have increased over the past six months. On the positive side, the continued deceleration of lending to households and house price dynamics has contributed to a moderation of the risks. However, the risk of a rapid deceleration of house price inflation in countries that still show signs of overvaluation persists. At the same time, the less favourable development and outlook not only for the labour market, but also for households' disposable income points to a deterioration in households' ability to service their debt.

Box 5

GAUGING RISKS TO EURO AREA HOUSE PRICES ON THE BASIS OF A DYNAMIC DIVIDEND-DISCOUNT MODEL

When housing is viewed as an asset, understanding the evolution of house prices is not unlike understanding the development of financial assets, in that changes in their valuation derives from news on fundamental determinants, or dividends, and expected returns. One methodology that is based on this notion and widely applied in understanding movements in financial asset prices (such as equities or bonds) is the dynamic dividend-discount model pioneered by Campbell and Shiller.[1] In its basic form, this model equates the excess return of a given asset over an alternative riskless asset to the discounted flow of dividends it provides along with changes in expected returns.

While housing can be characterised as both an asset and a consumption good, house prices would be expected from both perspectives to exhibit a long-run relationship with the analogous concept, in the above model, of dividends in the form of a rental yield. From the perspective of housing as an asset, house prices embed information about dividends in the form of the flow of future housing services (which can be proxied by the rental yield), in addition to expected returns. From the perspective of housing as a consumption good, house prices should co-move with rents in the long run, given the substitutability – on aggregate, in the absence of frictions or borrowing constraints – between renting and owning a house.

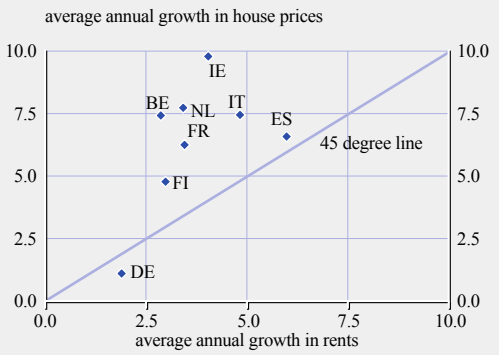
While such a long-run relationship may be expected, house prices in the euro area – similar to those in other developed economies – have exhibited considerably stronger growth than witnessed in housing rents over the last decade (see Chart A where an equal growth rate of the two series is captured by the 45 degree line). The implied deterioration of the ratio of the observed

1 See, J. Campbell and R. Shiller, "The dividend-price ratio and expectations of future dividends and discount factors", *Review of Financial Studies*, 1988, and J. Campbell and R. Shiller, "Stock prices, earnings and expected dividends", *Journal of Finance*, 1988.

house price to contemporaneous observed rent has been the subject of numerous studies. This literature, however, has tended to examine the relationship between house prices and rents in a static variant of the dividend-discount model, whereby expected returns are assumed to be constant across time. In the dynamic variant of the dividend-discount model, an alternative interpretation is that changes in expected returns on housing as an asset class, as well as rental yields, could have exerted influence on the evolution of euro area house prices.

Chart A House prices and rents in selected euro area countries

(average percentage changes over 1985-2007)



Sources: National data and ECB calculations.
Note: Rents reflect the HICP component of rent extended back using national data.

This box uses a dynamic dividend-discount model to decompose euro area house price developments into cash-flow fundamentals – in the form of rents – and expected returns.[2] A vector autoregressive (VAR) model is run, closely following the methodology used to analyse US equity prices,[3] for a panel of eight euro area countries (Belgium, Germany, Ireland, Spain, France, Italy, the Netherlands and Finland) using quarterly data over the period from 1985 to 2007. In this framework, real returns on housing (defined as real house price inflation less the real "risk-free" return on a long-term government bond) are related to dividends from home ownership in the form of the rental yield (proxied by observed housing rents), with controls for other important determinants of house prices, such as real long-term interest rates and real disposable income per capita.

A variance decomposition of changes in excess returns on housing, based on the above-mentioned methodology and data, is contained in Table A. The methodology relates returns on housing in excess of the risk-free rate of return to two factors: a systematic news component (consisting of shocks to expected cash flows in the form of rents) and an idiosyncratic news component (consisting of shocks to expected return news). The results indicate that housing returns are driven mainly by news on country rents, though with an important but less sizeable influence of market-wide (or expected-return) variations for house prices. Specifically the cash-flow news variance of 0.466 is significantly larger than that of news on expected returns of 0.120. A negative and sizeable correlation between the two independent news series suggests that house prices overreact to each type of independent news.

Table A Variance decomposition of unexpected excess return to housing

(percentage points)

	Variance	Jackknife standard error
Expected return news	0.120	(0.008)
Cash-flow news	0.466	(0.028)
– Correlation between expected return and cash-flow news	-0.296	(0.025)
– Ratio of expected return news variance to total unexpected-return variance	0.136	(0.149)
– Ratio of cash-flow news variance to total unexpected-return variance	0.529	(0.527)

Sources: National data and ECB calculations.
Note: Return decomposition results from a four variable panel VAR, including real house prices, rents, the real interest rate and real per capita disposable income.

2 The analysis is based on P. Hiebert and M. Sydow, "What drives returns to euro area housing? Evidence from a dynamic dividend-discount model", *ECB Working Paper*, forthcoming.
3 See, T. Vuolteenaho, "What drives firm-level stock returns", *Journal of Finance*, 2002.

In the context of historically higher volatility in house prices, as compared with that of rents, stable low-frequency variation in expected returns could therefore have contributed to large and persistent swings in house prices.

The above observations give rise to two issues related to financial stability. First, while the bulk of the variability of house price movements in the panel of countries analysed can be attributed to movements in the rental yields, market-wide movements in expected returns still exert some influence on euro area house prices. In this way, a generalised deterioration in expected returns on housing investments may permeate the housing markets of all euro area countries, irrespective of the evolution of fundamentals. Second, the results suggest that house prices overreact to news, thereby presenting risks of house price developments overshooting, in particular with respect to deterioration in fundamentals. While the ongoing slowdown in the annual growth rate of euro area residential property prices has remained gradual to date, such a characterisation could well apply to house price dynamics in some regions at the present juncture.

There are several caveats to the analysis, notably the role of country heterogeneity, the possibility that non-market forces influence the flexibility of house prices and rents, and their implied substitutability, along with the possibility of changing institutional factors, structural economic change and statistical issues that could imply some change in historical or equilibrium relationships. Nevertheless, the results can be considered to contain an illustrative assessment of the relationship between changing euro area house prices and changing fundamentals in a dynamic framework when allowing for changes in expected returns.

III THE EURO AREA FINANCIAL SYSTEM

3 EURO AREA FINANCIAL MARKETS

After the finalisation of the June 2008 FSR, tensions intensified in the euro area money market, fuelled by concerns about the condition of the global financial system. In late September, the functioning of the money market, in particular the redistribution of interbank liquidity, became seriously impaired, and tensions have remained visible since then. The spreads between the ECB policy rate and the EURIBOR, on which many other lending rates in the economy are based, remained much higher than usual. In longer-term corporate bond and credit markets, spreads increased substantially and financial market liquidity was thin. Demand for, and the issuance of, debt securities, especially more complex ones, declined, thereby raising the funding liquidity risk for various prospective issuers. The outlook for the euro area credit and equity markets remains biased towards the downside, not least because of a looming deterioration in the credit cycle.

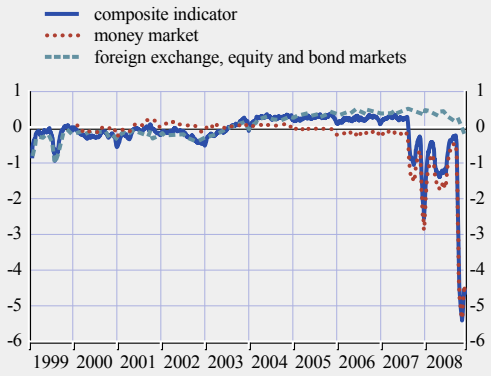
3.1 KEY DEVELOPMENTS IN THE MONEY MARKET

Liquidity in the euro area money market continued to deteriorate (see Chart 3.1), as the perceived increase in counterparty credit risk prompted many liquidity providers, in particular banks and money market funds, to hoard liquidity. Trading volumes decreased as well, as evidenced by the findings of the Euro Money Market Survey 2008 (see Box 6).

By early September, liquidity seemed to have improved for the shortest maturities, but remained in short supply for maturities in excess of one month. The ECB provided ample liquidity in its regular weekly operations, allowing banks to frontload their reserve requirements during the maintenance periods. In addition, the ECB renewed its supplementary longer-term refinancing operations with maturities of three and six months. This policy resulted in a relatively stable EONIA during most maintenance periods to September. The EURIBOR, by contrast, rose in June, mainly on market expectations of a rate increase of 25 basis points by the ECB at the Governing Council meeting on 3 July.

Chart 3.1 Financial market liquidity indicator for the euro area and its components

(Jan. 1999 – Nov. 2008)

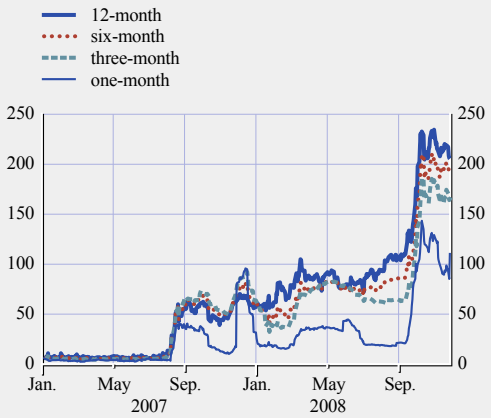


Sources: ECB, Bank of England, Bloomberg, JPMorgan Chase & Co., Moody's KMV and ECB calculations.
Notes: The composite indicator comprises unweighted averages of individual liquidity measures, normalised on the period 1999-2006 (non-money market components) and 2000-2006 (money market components). The data shown have been exponentially smoothed. For more details, see Box 9 in ECB, *Financial Stability Review*, June 2007.

Even prior to mid-September, however, the levels and changes in spreads between unsecured interbank and EONIA swap rates (see Chart 3.2) were suggestive of elevated

Chart 3.2 Spreads between EURIBOR and EONIA swap rates

(Jan. 2007 – Nov. 2008; basis points)



Source: Bloomberg.

tensions. From early May to early September, spreads decreased for maturities of up to three months, but increased for longer maturities, suggesting a rise in counterparty credit risk concerns. The new facilities established by central banks' and their clearly demonstrated willingness to provide the necessary liquidity should have contributed to reducing concerns among banks about short-term liquidity; banks, however, became increasingly worried about the creditworthiness of other banks (see also Chart S70).

Box 6

STRUCTURAL TRENDS IN THE EURO MONEY MARKET

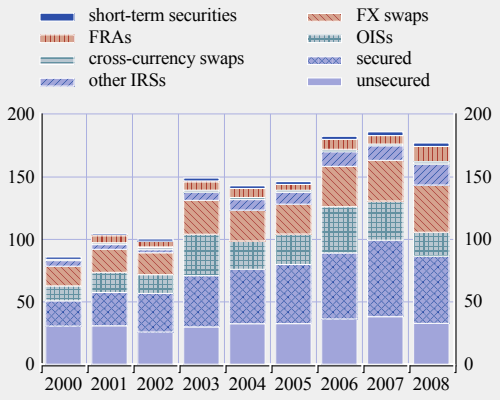
On 26 September 2008, the ECB published the preliminary results of the Euro Money Market Survey 2008. Similar to earlier surveys, the 2008 survey was based on data collected from banks, and it covered the second quarters of 2007 and 2008. This box reports on some of the main findings of this survey.

First, the aggregated turnover of the euro money market decreased in the year to the second quarter of 2008 (see Chart A). Activity decreased in the unsecured, secured and overnight index swap (OIS) segments of the market, as banks were focusing more on daily liquidity management rather than committing to strategic decisions. They also became unable to rely entirely on the interbank market for their funding needs and participated more actively in the refinancing operations conducted by the ECB.

Second, despite heightened concerns about the creditworthiness of counterparties in the interbank market, there was no obvious substitution of secured for unsecured transactions. However, the survey shows that credit concerns may have led to a shortening of the maturities in unsecured lending transactions and to a higher turnover in secured overnight transactions. In addition, banks showed a greater preference to lend to their national counterparties, possibly because they were, or felt, better informed about their financial condition. In most segments, the share of electronic trade declined, as banks gravitated towards more discreet methods such as direct trading and voice-brokered transactions. Nevertheless, the proportion of electronic trading in the secured market remained the highest in comparison with all other segments.

Chart A Aggregated average daily turnover by euro money market segment

(Q2 in period 2000 – 2008; index: aggregated average daily turnover volume in 2002 = 100)



Source: ECB.

Third, activity in over-the-counter (OTC) money market derivatives increased slightly in the year to the second quarter of 2008. Nevertheless, the turnover in OISs declined, as the focus for banks' treasurers changed from ECB interest rate moves (in the second quarter of 2007) to liquidity management (in the second quarter of 2008): while OISs were

very popular for trading and hedging purposes in the second quarter of 2007, their use was reduced in the first quarter of 2008 as treasurers focused on securing liquidity. By contrast, the turnover in other interest rate swaps (IRSs) and in forward rate agreements (FRAs) increased markedly, as volatile EURIBOR fixings made it necessary for treasurers and long-term swap traders to use these instruments to hedge their positions.

Fourth, the unsecured market remained the least concentrated, in stark contrast to the high degree of concentration in the OTC derivatives markets. The secured market was in an intermediate situation in the second quarter of 2008 as far as concentration was concerned.

It is also noteworthy that EURIBOR/OIS spreads were influenced by the reportedly strong demand for US dollar liquidity by European banks, as funds borrowed in euro can be swapped for US dollars. Moreover, such cross-currency activity, and the correlated changes in equivalent spreads of other major currencies, suggests that money markets may have become increasingly interconnected and that tensions in any single major money market should no longer be viewed in isolation from developments elsewhere (see also Box 3 in Section 1.2).

In mid-September, the situation in major money markets throughout the world deteriorated significantly, as the default of Lehman Brothers fuelled concerns about counterparty credit risk and challenged the widespread belief that any large bank that was supposedly too big, or too interconnected, to fail would be rescued by public authorities. Consequently, the EURIBOR increased sharply across all maturities. The spreads between unsecured interbank and EONIA swap rates rose further for maturities of more than three months, but also picked up sharply for shorter maturities, suggesting that counterparty credit risk concerns were contaminating market perceptions of liquidity.

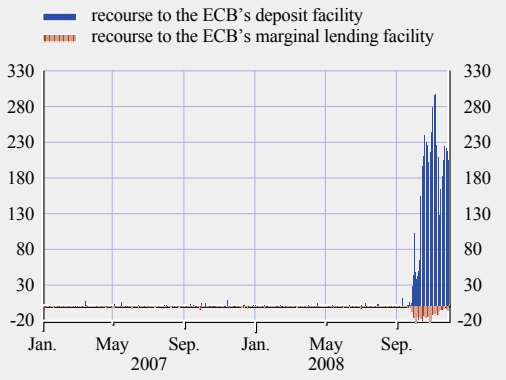
Increased concerns about the creditworthiness of counterparties and uncertainty regarding their own liquidity positions prompted banks to either hoard liquidity or to lend money only for the shortest maturities or only against higher-grade collateral. In the unsecured segment, liquidity became very scarce for maturities beyond one week, and basically disappeared for still longer maturities. Most unsecured interbank lending was concentrated on the overnight maturity segment, but even overnight liquidity remained scarce.

Fears of further defaults in the financial sector, fed by relentless market rumours, resulted in some banks struggling to obtain funds even at rates considerably higher than the EONIA, which also became much more volatile. Banks were forced to take more frequent recourse to the ECB marginal lending facility. At the same time, amounts lodged in the ECB's deposit facility rose as well (see Chart 3.3), implying that the redistribution of interbank liquidity had become seriously impaired.

Consequently, participation in the ECB's liquidity operations increased, with the number

Chart 3.3 Recourse to the ECB's marginal lending and deposit facilities

(Jan. 2007 – Nov. 2008; EUR billions)



Source: ECB.

of bidders in the main refinancing operations more than doubling from the level recorded at the beginning of 2008 (see Chart 3.4).

In order to alleviate liquidity pressures, the ECB continued to provide ample liquidity via its main refinancing operations and responded to liquidity strains with more frequent fine-tuning operations. As funding was very difficult to obtain for longer maturities, banks' treasurers became very uncertain of the bid rates necessary to secure liquidity at these auctions. As a result, bidding rates increased, often to well above the market expectations revealed in polls and possibly as a consequence of strategic behaviour in the increasingly segmented interbank market. The spreads between allotment rates and the minimum bid rate surged to unprecedented levels; the value of the ECB's market liquidity index also dropped considerably, suggesting a strong link between funding liquidity pressures and market liquidity (see Box 7).

Chart 3.4 Number of bidders in the ECB's main refinancing operations

(Jan. 2007 – Nov. 2008)

Source: ECB.

Box 7

FUNDING LIQUIDITY, FUNDING LIQUIDITY RISK AND ITS INTERACTION WITH MARKET LIQUIDITY[1]

The developments in the various segments of the euro money market since August 2007 are typical of a liquidity crisis and suggest the existence of a link between market liquidity and funding liquidity risks. Nevertheless, empirical evidence of this link is difficult to find, mainly due to the problem of measuring funding liquidity risk. This box discusses the notions of funding liquidity and funding liquidity risk, proposes a simple indicator for measuring funding liquidity risk and presents an empirical link between market and funding liquidity, based on evidence from recent data.

Funding liquidity and funding liquidity risk

Funding liquidity is defined as the *ability to settle obligations immediately when due.* Consequently, a bank is illiquid if it is unable to settle obligations on time. Given this definition, it can be said that *funding liquidity risk is driven by the possibility that, over a specific horizon, the bank will become unable to settle obligations when due*.

Funding liquidity is essentially a zero-one concept, i.e. a bank can either settle obligations, or it cannot.[2] *Funding liquidity risk*, on the other hand, can take on infinitely many values reflecting the magnitude of risk. Moreover, *funding liquidity* is a point-in-time concept, while *funding liquidity risk* is forward-looking. As long as the bank is not in an absorbing state, both liquidity and illiquidity are possible. The likelihood of either depends on the time horizon considered

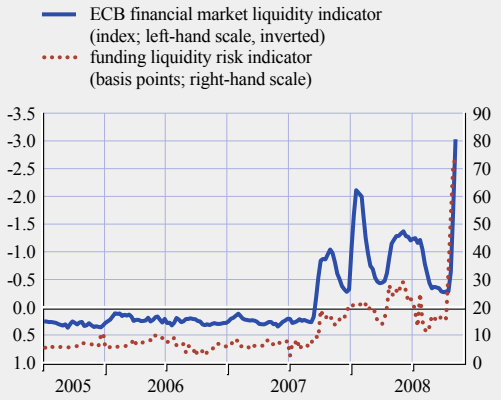
1 This box is based on M. Drehmann and K. Nikolaou, "Funding liquidity risk: definitions and measurement", *ECB Working Paper*, forthcoming.
2 This is equivalent to the definition of solvency, where a bank is said to be solvent if the current value of its assets is higher than the value of its liabilities.

and on the nature of the funding position of the bank. In this respect, concerns about the future ability to settle obligations or to raise cash at short notice, i.e. future funding liquidity, will impact on current funding liquidity risk.

Considering the implementation of the aforementioned definitions, a more operational definition would be helpful. To this end, the definition of a settlement asset is narrowed down to central bank money, since in the vast majority of cases, the latter is one of the most important settlement assets from an aggregate point of view. Hence, the ability to settle is crucially linked to the ability to satisfy the demand for central bank money. Therefore, a more narrow definition of funding liquidity can be the *ability to settle obligations with central bank money immediately when due*.

Chart A Funding liquidity risk and financial market liquidity indicators

(June 2005 – Oct. 2008)



Sources: ECB, Bank of England, Bloomberg, JPMorgan Chase & Co., Moody's KMV and ECB calculations.
Note: The proxy funding liquidity risk indicator equals the difference between the weighted average rate of successful bids in ECB main refinancing operations conducted through variable rate tenders and the ECB policy rate. For more details on the ECB financial market liquidity indicator, see Chart 3.1.

A simple indicator of funding liquidity risk

In practice, a bank is able to satisfy the demand for central bank money, and is thus liquid, as long as outflows of central bank money are smaller than, or equal to, inflows at each point in time. However, the net amount of central bank money needed to remain liquid is uncertain from an ex-ante perspective and depends on the stochastic volume of liquidity required and the stochastic prices of acquiring it. Such uncertainties generate funding liquidity risk. The theoretical and empirical literature shows that higher funding liquidity risk implies a higher marginal valuation of liquidity, which – in turn – is linked to higher bids at central bank liquidity auctions. Although submitted bids may not perfectly reflect the marginal value for funding liquidity due to bid shading,[3] they should provide an ordinal proxy indicator of funding liquidity risk.

The proposed funding liquidity risk indicator takes into account information on both the price of liquidity (i.e. the bid rate minus the ECB policy rate) and the volume of liquidity obtained (i.e. the volume allotted), normalised by the total volume of liquidity provided, in order to maintain consistency across auctions of differing size. Summing up this information across bids and banks gives an aggregate proxy of funding liquidity risk (see Chart A), which equals the weighted average rate of successful bids minus the policy rate, i.e. variables routinely reported by the ECB when main refinancing operations are conducted through variable rate tenders.

Funding liquidity risk and market liquidity

Theoretical research has rationalised strong interactions between funding liquidity risk and market liquidity in periods of crisis.[4] Shocks to funding liquidity can lead to asset sales

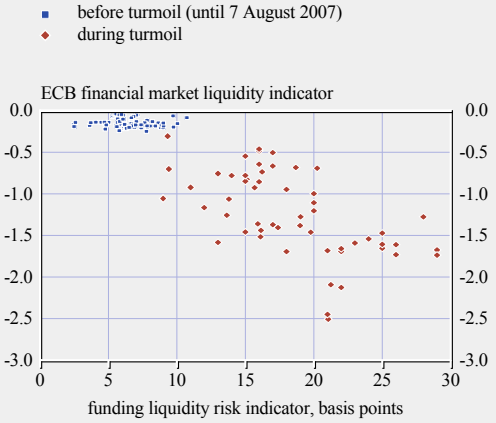
3 Bid shading refers to the practice of a bidder placing a bid that is below an estimated fair price.
4 See M. Brunnermeier and L. H. Pedersen, "Market liquidity and funding liquidity", *National Bureau of Economic Research Working Paper No 12939*, February 2007.

and may depress asset prices, with dire consequences for market liquidity. The loop is established when lower market liquidity leads to higher margin calls, which increase funding liquidity risk as outflows rise. A downward liquidity spiral begins, as a new round of asset sales begins so that banks can remain liquid.

Whilst the theoretical exposition is clear, and many observers consider it relevant to the recent turmoil, a lack of indicators of funding liquidity risk has delayed empirical validation. Using the suggested indicator, it is possible to empirically support these interactions by looking at the interrelationships between the proposed funding liquidity risk proxy indicator and the ECB's indicator of financial market liquidity.[5]

Chart B Relationship between funding liquidity risk and market liquidity

(June 2005 – Oct. 2008; index and basis points)



Sources: ECB, Bank of England, Bloomberg, JPMorgan Chase & Co., Moody's KMV and ECB calculations.
Notes: The proxy funding liquidity risk indicator equals the difference between the weighted average rate of successful bids in ECB main refinancing operations conducted through variable rate tenders and the ECB policy rate. For more details on the ECB financial market liquidity indicator, see Chart 3.1.

A scatter plot of the funding liquidity risk indicator and the ECB's financial market liquidity indicator is presented in Chart B. A clearly negative relationship can be seen, i.e. when market liquidity falls, funding liquidity risk increases. There was, however, no significant relationship between funding liquidity risk and market liquidity prior to the turmoil; it emerged only after the turmoil had unfolded. This is in keeping with the theory that such interactions emerge only when banks face funding constraints.

5 See Chart 3.1.

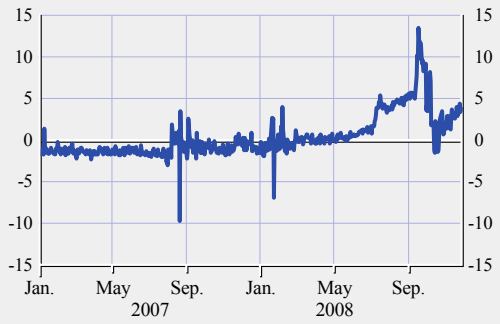
The overall situation in the unsecured interbank money market was extremely tense at the end of September: banks were increasingly dependent on ECB liquidity operations and overnight borrowing, as lending for longer maturities had ceased almost completely.

The availability and cost of interbank secured borrowing deteriorated as well. The spread between three-month repo and EONIA swap rates, which was generally negative before the start of the market turmoil, became positive in June, and widened significantly in mid-September (see Chart 3.5). This change possibly reflected banks' willingness to secure liquidity in the repo market, even at elevated rates. Moreover, there was a growing demand for high-quality liquid paper, which had become scarcer in the repo market. Concerns spread to the tri-party repo market, where liquidity providers tightened their criteria for collateral.

Faced with such market dysfunction, the ECB decided on 8 October to conduct its main refinancing operations through a fixed rate tender procedure with full allotment, and to reduce the corridor set by its standing facility rates from 200 basis points to 100 basis points, for as long as this was deemed necessary. In addition, on 15 October, the ECB announced additional measures to further expand the list of assets eligible as collateral in its liquidity operations and to enhance the provision of longer-term liquidity by fully meeting banks' demand for

Chart 3.5 Spread between the three-month euro repo rate and the EONIA swap rate

(Jan. 2007 – Nov. 2008; basis points)



Source: Bloomberg.

Chart 3.6 Three-month forward EURIBOR/OIS spreads

(May 2008 – Nov. 2008; basis points)

Source: ECB.

liquidity at maturities of three and six months. These measures, together with the cut of 50 basis points in the policy rate on 8 October and later by the same amount on 6 November, helped to somewhat reduce the tensions in the euro area money market, although the recovery by late November was only modest.

Tensions were also noticeable in other segments of the euro area money market. In the euro commercial paper (ECP) market, issuance and the amounts outstanding of financial commercial paper first stabilised after the finalisation of the previous FSR, while the non-financial segment continued to grow. As of mid-September, however, some investors became concerned about the credit quality of the certificates of deposit issued by banks, resulting in a significant decline in the issuance of such instruments. In addition, investors' demand for asset-backed euro commercial paper (ABECP) remained weak. By contrast, the segment referred to as the short-term European paper (STEP) market remained relatively resilient. The overall situation in the ECP market in late November reflected widespread risk aversion, concerns about the creditworthiness of financial institutions and an increased discrimination by investors with respect to issuers.

Looking ahead, market participants do not expect the existing tensions in the euro area money market to dissipate soon. On the contrary, they believe the financial turmoil will continue to weigh on the euro area money market. In reflection of such expectations, the forward spreads between unsecured interbank and EONIA swap rates remained high, even over relatively long horizons (see Chart 3.6).

In late November, the protracted tensions in the euro area money market posed a number of serious risks. First, some banks had difficulties in securing liquidity in the interbank market and, therefore, became increasingly dependent on overnight borrowing and the ECB's provision of liquidity. Second, the issuance of short-term debt securities, and the associated funding plans of various issuers, was at risk. Third, the price of funds in the unsecured interbank market remained volatile and far higher than the ECB's main refinancing rate. Since the EURIBOR is widely used as a benchmark for other lending rates in the economy, their continued high levels above the ECB policy rate increases funding costs not only for financial entities, but also for borrowers from non-financial sectors.

3.2 KEY DEVELOPMENTS IN CAPITAL MARKETS

GOVERNMENT BOND MARKETS

Ten-year government bond yields in the euro area have declined since the publication of the last FSR, but fluctuations have been strong (see Chart S73). As inflation fears abated with the decline in oil prices, growing concerns about both future economic activity and the state of the global financial system weighed markedly on government bond yields.

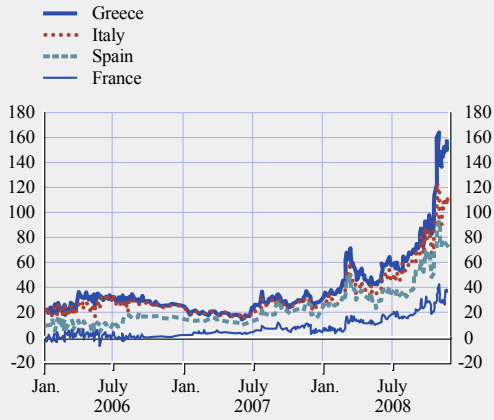
Investors' concerns about the strength of economic activity and the ongoing financing difficulties in global markets have also led to a sharp widening of intra-euro area government bond yield spreads (see Chart 3.7), which reached levels not seen since the start of Stage Three of Economic and Monetary Union (EMU). Comparable sovereign credit default swap (CDS) premiums also widened, suggesting a strong element of rising credit risk premia.

Flight-to-quality and flight-to-liquidity considerations seemed also to play an important role in the widening of sovereign spreads. After early May, the generally negative correlations of bond and stock returns in the three largest euro area economies slightly increased (see Chart 3.8), but the differences between correlations decreased along with the ongoing stock market decline. The fact that such correlation has been more negative for German government bonds since the start of the financial turbulence supports the view that investors were discriminating across sovereign issuers in their search for safer returns. The preference for German Bunds also reflected a deterioration in liquidity conditions in other euro area government bond markets, the presence of a liquid and deep Bund futures market that facilitates hedging operations and the tightening of collateral requirements in the interbank credit market, in particular after the bankruptcy of Lehman Brothers.

Looking ahead from a fundamental perspective, there seem to be some downside risks for euro area long-term government bond yields. The ongoing pessimism on the strength of near-term economic activity and flight-to-safety flows could drag nominal yields down in the months to come. On the other hand, the financing needs of some governments stemming from agreed guarantees and capital injections for the banking

Chart 3.7 Intra-euro area yield spreads on ten-year government bonds

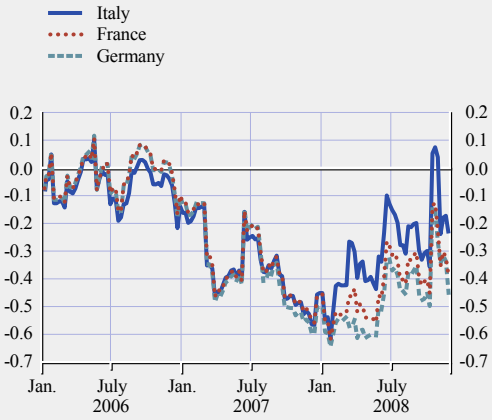
(Jan. 2006 – Nov. 2008; basis points)



Sources: Reuters and ECB calculations.
Note: The chart shows ten-year yield spreads relative to Germany.

Chart 3.8 Conditional correlation between weekly bond and stock returns

(Jan. 2006 – Nov. 2008)



Sources: Reuters, Thomson Financial Datastream and ECB calculations.
Note: Estimated using a multivariate GARCH model. Stock returns are based on the Dow Jones EURO STOXX index and bond returns on the ten-year Thomson Financial Datastream bond indices for each country.

sector as well as potentially higher general government deficits may put some upward pressure on bond yields.

CREDIT MARKETS

In September and October 2008, credit markets went through a period of intense stress when they were virtually frozen, apart from the CDS market. This was due to a sequence of negative credit events involving large financial institutions and fears about a further deepening of the crisis, including further defaults of financial institutions. By late November, bond and CDS spreads had widened further across all market segments and issuance had almost vanished, although there were some signs that securitisation activity in the euro area was relatively less affected by the turmoil than that in the United States and the United Kingdom.

Credit spreads

Euro area corporate bond spreads for most rating categories have widened further since the publication of the previous FSR (see Charts S81 and S82). In September, high-yield corporate bonds and, in particular, financial sector spreads were hit especially hard by the spillover effects resulting from a number of failures of large US financial institutions. The deterioration continued in October, when speculative-grade corporate bond spreads, for instance, almost doubled within three weeks.

By late November 2008, spreads of euro area non-financial corporate bonds had risen to new record highs, exceeding the levels seen in 2001-02 when the corporate sector faced challenging funding conditions in the aftermath of the dot-com bubble. The rapid widening of corporate bond spreads was due to fears that the credit crisis may negatively affect the corporate sector via challenging external funding conditions as a result of the lack of credit and the expected deterioration of the macroeconomic environment (see Chart 3.9). In this context, some corporates with large commercial paper or debt security issuance programmes were facing difficulties in refinancing their debt.

Chart 3.9 Funding costs and macroeconomic conditions in the euro area

(Jan. 1999 – Oct. 2009)

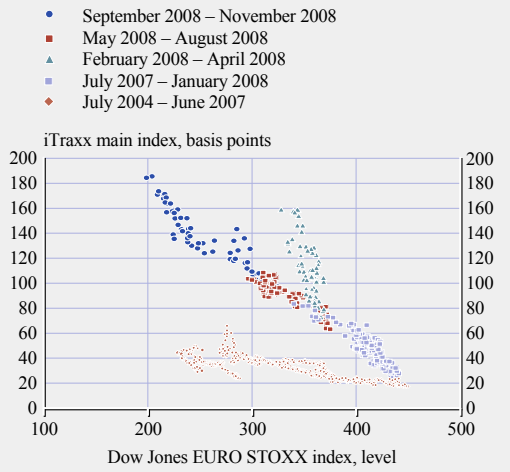
Sources: Eurostat, JPMorgan Chase & Co. and Moody's.

This was accompanied by a significant widening of the spreads of euro area residential mortgage-backed securities (RMBSs), particularly those backed with mortgages in countries which faced housing price declines, as well as of securities backed with commercial property loans and collateralised loan obligations (CLOs) backed with loans extended in euro. By late November 2008, the spreads had reached new record highs on account of extreme risk aversion among investors to credit risk in the aftermath of a series of rescue operations involving both US and European financial institutions.

In the first three months after the finalisation of the June 2008 FSR, prices in the credit derivatives market seemed more resilient than in equity markets, as most market participants – drawing on the lessons learnt from the takeover of Bear Stearns in March 2008 and the plan of July 2008 to support the government-sponsored enterprises in the United States – considered that additional failures would be more detrimental to shareholders than to creditors. However, this view weakened after the default of Lehman Brothers in September.

Chart 3.10 Relationship between the Dow Jones EURO STOXX and the iTraxx main index

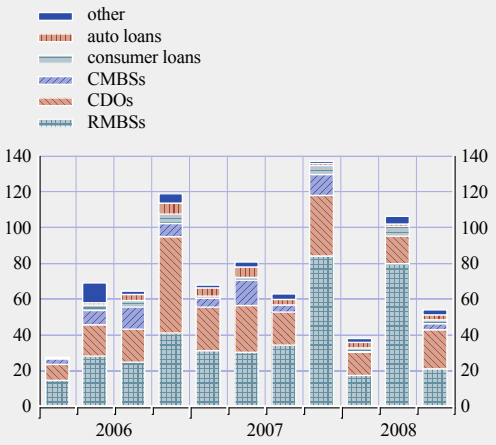
(July 2004 – Nov. 2008)



Source: Bloomberg.

Chart 3.11 Securitisation in the euro area by type of collateral

(Q1 2006 – Q3 2008; EUR billions)



Source: JPMorgan Chase & Co.

As a result, the CDS premia of European financial institutions widened significantly and reached new record highs in the first half of October (see Chart S85). This also spilled over to the CDS premia of non-financial corporates. By late November, the iTraxx main index had increased substantially, exceeding even the levels seen in mid-March 2008 when Bear Stearns was rescued (see Chart S83 and Chart 3.10).

CDS premia of European financial companies also became more dispersed, as market participants differentiated between the most exposed financial institutions and those with a less risky profile (see Section 4.3). Moreover, the recent developments in the US financial sector highlighted the risks of negative price spirals in the CDS and equity markets affecting some particular banks, sometimes fuelled by unverified market rumours.

Debt security issuance

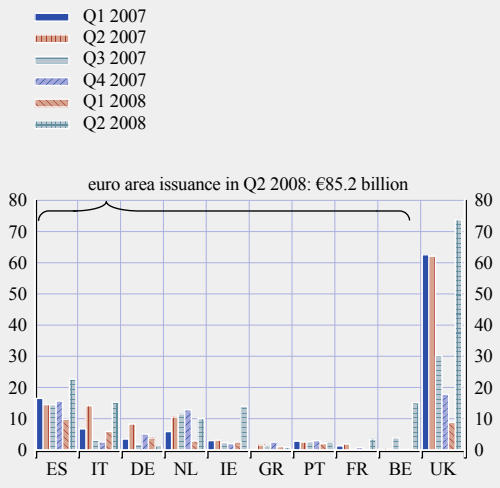
Corporate bond issuance in the euro area became even more difficult after early May, and basically disappeared in the high-yield segment by October 2008 (see also Section 2).

The negative market sentiment was also evident in the limited demand for structured finance products, as activity levels in both primary and secondary securitisation markets remained subdued on account of both the ongoing turmoil and the extreme risk aversion among investors (see also Special Feature E). In addition to that and in view of rapidly rising spreads, which made new issuance very costly, securitisation markets still faced a lack of transparency regarding transaction-related information and an absence of standardisation with respect to asset-backed securities (ABSs) as investment products (see Box 8). Nevertheless, in the third quarter of 2008, there was still some issuance of structured finance products in the euro area, mainly in the form of RMBSs (see Chart 3.11).

New securitisation in the euro area fell by 30% on a year-on-year basis in the first quarter of 2008. In the second quarter, however, the issuance activity was 51% higher than in the same period of the previous year (see Chart 3.12), but subsequently decreased again in the third quarter of 2008 (see Chart 3.11). Issuance activity in the euro

Chart 3.12 European securitisation by country of collateral

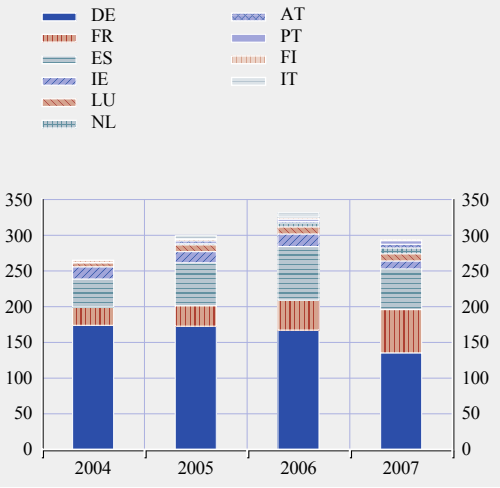
(Q1 2007 – Q2 2008; EUR billions)



Source: European Securitisation Forum.

Chart 3.13 Covered bond issuance in the euro area

(2004 – 2007; EUR billions)



Sources: European Mortgage Federation and European Covered Bond Council.

area securitisation markets remained weak, but did not disappear completely, possibly on account of the more elastic policy of the Eurosystem on the eligibility of collateral for its open market operations, which did not rule out the possibility of using ABSs as collateral in cases where a bank had originated and then retained the securities on its own balance sheet.[1] Nevertheless, issuance of more risky CMBSs and less transparent CDOs vanished.

As this wholesale financing channel has to a large extent evaporated, counterparties have turned to central banks with less liquid assets, such as ABSs and kept the more liquid assets for the interbank repo markets. Thus, it seems that the former originate-to-distribute banking business model has changed into originate-to-retain and originate-to-repo models. It also indicates that the securitisation market is currently malfunctioning. Looking ahead, it seems that structured finance markets will remain subdued until tensions and risk aversion ease. Upon recovery, it is highly probable that the issuance of plain-vanilla instruments will improve first.

As regards covered bonds, which have become an increasingly popular way of financing banking business in the euro area in recent years, it is noteworthy that their issuance was not affected as severely as that of the securitised products discussed earlier (see Chart 3.13). At the same time, the complexity of covered bonds has increased, and the legal framework for such bonds differs across euro area countries, although there is a move towards developing a harmonised framework. One attractive feature of covered bonds for investors is that such securities enjoy legal protection in the event of an issuer's bankruptcy, and the holder of covered bonds can also turn to the issuer in the event of the cover pool not being sufficient. By late November 2008, however, weak demand for bonds of financial institutions had spilled over to the euro area covered bond market, so that it was characterised by low liquidity and significantly impaired issuance conditions.

1 The Bank of England introduced similar rules in April 2008.

The outlook for credit markets remains biased towards the downside on account of the possible deterioration of the credit cycle and negative housing market prospects. Thus, funding via credit markets has become more challenging and expensive. Moreover, in the period ahead, it may be accompanied by increasing corporate default rates, which may have a negative impact on the recovery of the credit market in the medium term.

Box 8

TRANSPARENCY IN SECURITISATION MARKETS

Since the outbreak of the ongoing financial market turbulence, liquidity in both the primary and the secondary securitisation markets has virtually vanished. Often cited reasons for this development in the securitisation markets are the lack of reliable valuation frameworks and the inadequate transparency of complex structured finance products, such as different types of asset-backed securities (ABSs). As a consequence of this post-outbreak analysis, many proposals aimed at restoring market liquidity, put forward by market participants and policy-making bodies alike, have focused on the need for firms to enhance the transparency of, and disclosure in, the securitisation markets. This box discusses the causes of the turbulence in terms of transparency and highlights what is currently going on to restore market confidence.

Structured finance products are generally heterogeneous in nature. This implies that standardisation in terms of disclosure, as well as performance analyses, has its limit on account of the high level of complexity and the differences between the transactions. The performance of structured finance securities depends significantly on the fundamental credit quality of the underlying assets that are being financed through the securitisation process.[1] Thus, to evaluate the fundamental credit quality of these assets should involve both qualitative and quantitative assessments. Missing data stemming from the lack of transparency hinder a proper overall assessment. In particular, when markets are stressed, the absence of reliable and credible information may drive market participants to assume the worst with respect to those financial instruments.

In response to the ongoing turbulence in the financial markets and the vanished liquidity, many initiatives have been put forward by various stakeholders with the aim of revitalising the markets. Approaches that are intended to enhance transparency and standardisation – and therefore liquidity and market efficiency – include:[2]

- The recommendation by the Financial Stability Forum (FSF) to "strengthen transparency at each stage of the securitisation chain, including by enhancing and standardising information on an initial and ongoing basis about the pools of assets underlying structured credit products".[3]

1 See also Fitch Ratings, "Unstructuring Structured Finance", July 2008.
2 There are also several other proposals concerning the securitisation markets, such as the recommendations of the Committee of European Banking Supervisors (CEBS) for banks to disclose their exposures to structured finance products, as well as the European Commission's draft legislative text concerning rating agencies.
3 See Financial Stability Forum, "Report of the Financial Stability Forum on Enhancing Market and Institutional Resilience", April 2008. In October, the FSF published a follow-up on the implementation. On transparency in securitisation, it is referring to market-led initiatives.

- The recommendations of the Institute of International Finance (IIF) which set out principles of conduct and market best practices for the global financial services industry across a wide range of areas, including transparency and disclosure issues.[4] In particular, the industry should, according to the IIF, develop harmonised guidelines on transparency and disclosure for structured products across major markets.

- The European Securitisation Forum (ESF), in response to the Ecofin Council's roadmap to stability of November 2007, is exploring a project for European RMBS transactions by updating the existing ESF Securitisation Market Practice Guidelines. This effort will likely focus on either developing country-specific reports, or, eventually, a single pan-European format to the extent that differences in national regulatory reporting can be overcome. In addition, the association is discussing further enhancements to transparency via a greater digitalisation of reporting formats and the inclusion of loan-by-loan reporting to increase the granularity of information provided to investors. Furthermore, the association aims to standardise disclosure practices and to enhance the accessibility, usability and comparability of information.

- Witnessing deterioration in the disclosure standards of rating agencies for some of the ABSs in recent times, the Eurosystem decided, within the scope of this year's review of the risk control framework, to require better rating disclosure standards. To be eligible as collateral for Eurosystem credit operations, ABSs will need a rating that must be explained in a publicly available credit rating report, i.e. a detailed pre-sale or a new issue report, which should include, inter alia, a comprehensive analysis of structural and legal aspects and a detailed assessment of the collateral pool. Moreover, rating agencies would need to publish rating reviews of ABSs on at least a quarterly basis.

Steps by the industry to agree on common standards and definitions, and to monitor these effectively, could facilitate the development of a "gold standard" for securities. It could include several standards, spanning different eligibility criteria over different types of assets. In a global marketplace, consistency of approach across national borders would clearly be desirable. This could, over the longer term, help promote investor confidence, extend the appeal of ABSs, improve conditions for an enhanced valuation framework and strengthen the market.[5] All such practices will need to be considered carefully to ensure that the data provided to investors does not result in a violation of relevant data protection or banking secrecy laws.

However, a distinction needs to be made between the standardisation of the ABS products and the transparency of these products. A requirement on standardisation does not imply transparency. For example, an RMBS investor would – given the magnitude of individual mortgage loans in the underlying portfolio and the related cost of analysing information on these loans – not necessarily be interested in having information on all underlying assets and its debtors. Instead, the challenge this market is facing is to build meaningful aggregates which reflect the profile of an RMBS portfolio and make it comparable to other RMBS portfolios. Thus, as there is a trade-off between ultimate transparency (detailed information on every single asset/debtor) and related information costs, the market may end up using

4 See Institute of International Finance, "Final Report of the IIF Committee on Market Best Practices: Principles of Conduct and Best Practice Recommendations", July 2008.
5 It is equally important to improve the valuation practices, including the modelling of default correlation in CDOs, and the modelling of house prices in the case of standard RMBSs. Better transparency on the underlying assets should contribute to this.

standardised and best-practice aggregates to analyse and characterise ABSs. These aggregates would not necessarily have to include the identity of each single underlying asset/loan/debtor, and confidentiality rules might not be affected. Standardised transparency would be a more appropriate attitude in which the amount and level of information should be specified.

Despite the broad scope of various initiatives, there is no room for complacency. Serious efforts are needed to restore deep and properly functioning markets that offer true secured funding possibilities. The responsibility for identifying areas of improvement and providing useful disclosures that allow investors to assess the risk/return profile of financial instruments rests primarily with the industry. It is therefore of utmost importance that individual market participants follow these recommendations and try to comply with most of them. At the same time, there should be no stretching of timetables for enhancing disclosure, as the latter is essential to bring back market confidence.

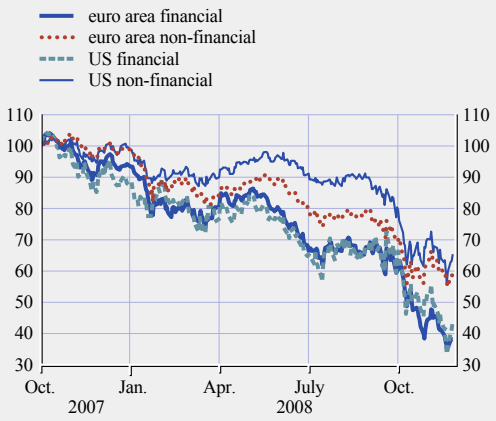
EQUITY MARKETS

After early May 2008, developments in the euro area equity markets reflected, albeit to varying degrees, the uncertainties prevailing with regard to the impact of the sub-prime crisis and the increasing concerns about the risk of recession (see Chart 3.14 and Chart S75). Concerns about the robustness of financial institutions and growing worries about the impact of the financial turmoil on economic activity resulted in substantial declines in the equity prices of both financial and non-financial corporations.

The implied volatility extracted from options on stock prices also suggested that short-term risk in the equity markets rose significantly over the summer (see Chart S76), in particular after the intensification of financial problems in US and euro area financial institutions. Net flows into equity funds that invest in European equities remained negative in the first three quarters of 2008 (see Chart 3.15), broadly in line with the indicator of global risk aversion presented in Chart S18.

Chart 3.14 Financial and non-financial stock prices in the euro area and in the United States

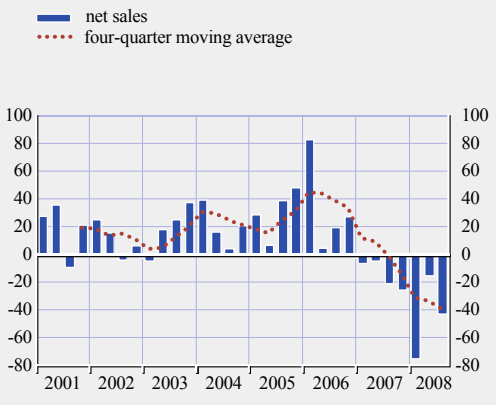
(Oct. 2007 – Nov. 2008; index: Oct. 2007 = 100)



Sources: Reuters and ECB calculations.

Chart 3.15 Net flows into European equity funds

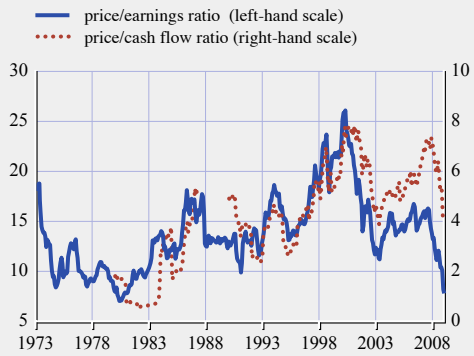
(Q1 2001 – Q3 2008; EUR billions)



Source: European Fund and Asset Management Association.
Note: Figures refer to net sales of equity funds linked to the Dow Jones STOXX 600 index.

Chart 3.16 MSCI euro area price/earnings and price/cash flow ratios

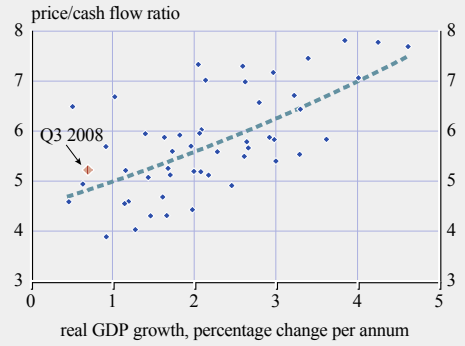
(Jan. 1973 – Nov. 2008; ratios based on 12-month trailing earnings and cash flows)



Source: Thomson Financial Datastream.
Note: Cash flows refer to funds from operations.

Chart 3.17 Price/cash flow ratios and real GDP growth in the euro area

(Q1 1996 – Q3 2008)



Sources: Thomson Financial Datastream and ECB calculations.
Notes: Real GDP growth measured in year-on-year rates. Q3 2008 growth figure is based on Eurostat's flash estimate.

By late November, equity prices had declined to levels that were quite low from a fundamental perspective. Standard equity valuation ratios, such as price/earnings (P/E) ratios based either on trailing or on 12-month-ahead earnings expectations, suggested that stock market prices had reached the lowest level recorded since the start of Stage Three of EMU (see Chart 3.16). The P/E ratios of financial stocks were particularly low, but the earnings of non-financial corporations were also priced by a factor that was significantly lower than in early May 2008. In addition, price/cash flow (P/C) ratios, which relate stock prices to funds from operations and are more directly influenced by the business conditions faced by firms, pointed to the same conclusion after their sharp decline since August 2008 (see Chart 3.16).

Looking ahead, the impact of the ongoing financial tensions on corporate earnings remains a concern. Although equity analysts have revised their earnings expectations down since the start of the turmoil, their estimates may turn out still to be too optimistic in the current macro-financial environment. Chart 3.17 shows the historical relationship between the P/C ratio and the year-on-year real GDP growth rate in the euro area. The latest available data point was at a level that suggests that a further slowdown in economic activity over the next quarters might lead to a further decrease in the P/C valuation ratios and, therefore, posed downward risks for stock prices, some of which have already materialised.

4 THE EURO AREA BANKING SECTOR

Large and complex banking groups (LCBGs) in the euro area experienced further fallout from the financial crisis in the six months after the finalisation of the June 2008 FSR. Financial disclosures for the first half of 2008 showed that their performances continued to be adversely affected by unfavourable financial market conditions and, increasingly, by rising funding costs. This notwithstanding, regulatory capital buffers improved moderately because of additional capital raised and a decline in the growth of risk-weighted assets. The actions that had to be taken by governments and central banks in October 2008 to support the banking systems in most euro area countries serve to illustrate the fragile state of the banking markets. These measures, which were taken to restore confidence in, and improve the resilience of, financial systems, contributed to stabilising the euro area banking system, by addressing liquidity needs and strengthening capital positions. In the near term, the main risk confronting LCBGs is the possibility of a renewed loss of confidence among market participants, which could cause further liquidity and capital strains. Looking further ahead, the expected deterioration in the macroeconomic environment will have an adverse impact on banks' earnings and asset quality both in the trading and in the banking book.

4.1 FINANCIAL CONDITION OF LARGE AND COMPLEX BANKING GROUPS[1]

In the first nine months of 2008, the performance of euro area LCBGs continued to be adversely affected by the financial turmoil that erupted in August 2007. Several euro area LCBGs experienced losses or very weak profits in the first nine months of 2008, and the distribution of the LCBGs' return on equity (ROE) shifted further to the downside. Both mark-to-market losses and impairment charges on loans and securities acted as a drag on profits.

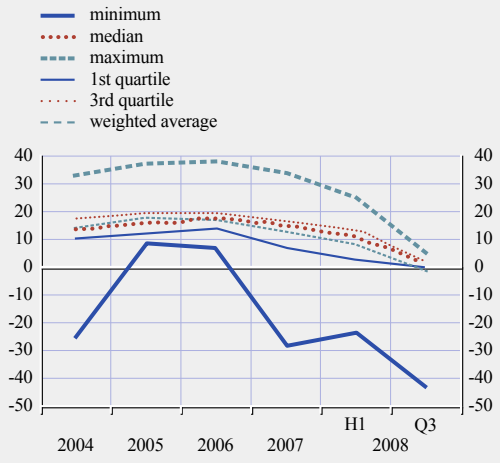
The wide dispersion in financial performances seen across euro area LCBGs in the second half of 2007 narrowed somewhat in the year to date as their performance deteriorated across the board (see Chart 4.1). The average ROE amounted to 8.7% in the first half of 2008 (and to -1.22% in the third quarter of 2008 for a smaller sub-sample), compared with 12.6% for 2007 as a whole. The similar drop in the median ROE, from 15.4% to 10.9% (1.25% in the third quarter of 2008), reflects the continuing skewing of losses across institutions. Institutions in the lowest quartile of the profitability distribution continued to suffer substantial decreases in their profitability, from just over 7% in 2007 to 3% in the first half of 2008 (0.3% in the third quarter of 2008). Chart S86 moreover shows that the proportion of institutions falling within the lowest two performance brackets increased from 17.6% of the groups' combined assets in 2007 to 31.3% in the first half of 2008. It should also be noted that some LCBGs made use of amendments to IFRS rules to switch assets from mark-to-market to hold-to-maturity during the third quarter of 2008, allowing them to avoid higher markdowns and accordingly reduce the effect on income.

As observed in the June 2008 FSR, it was the challenges of the second half of 2007 that mainly contributed to the deterioration in banks' full-year 2007 performances. In comparison with the second half of 2007, the ROE of euro area LCBGs actually improved in the first half of 2008, from 5.2% to 8.4%, and the median ROE improved from 6.9% to 9.0% (using equity instead of average equity as the denominator and excluding one extreme outlier).

1 The sample of LCBGs, which is the focus of this chapter, underwent some changes as a result of an annual exercise assessing the importance of the various institutions in the euro area, as described in Box 10 in ECB, *Financial Stability Review*, December 2007. Two entities were added to the group of euro area LCBGs, while one entity dropped out due to merger and acquisition (M&A) activity. All historical time series were adjusted accordingly.

Chart 4.1 Dispersion in return on equity (ROE) for euro area large and complex banking groups

(2004 – Q3 2008; percentage)

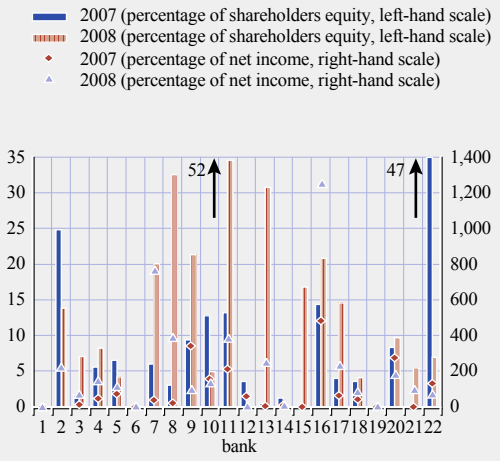


Sources: Individual institutions' financial reports and ECB calculations.
Note: Q3 2008 figures are available for 11 out of 22 LCBGs.

Nevertheless, there is little reason for optimism since those LCBGs that suffered substantial losses in the second half of 2007 remained among the weakest ones in the first nine months of 2008. Equally, financial crisis-related write-downs remained large, amounting to roughly 4.7% of the euro area LCBGs' outstanding equity capital in 2007 and to 6.5% in the first nine months of 2008. That said, quite a few institutions continued to be relatively unaffected by the financial market dislocations (see Chart 4.2).

Chart 4.2 Impact of the turbulence on the net income of euro area large and complex banking groups

(2007 – Q3 2008)



Sources: Individual institutions' financial reports, Bloomberg and ECB calculations.

The return on risk-weighted assets, an alternative profitability indicator, also declined from 1.12% in 2007 to 0.84% in the first half of 2008, due to continued income weakness, and was only partly offset by a 6% fall in risk-weighted assets in the first half of 2008. Chart S87 illustrates the downward shift in euro area LCBGs' performance, with weakly performing institutions (in the lowest three brackets of the distribution) accounting for about one-third of the groups' combined assets, up from 16% in 2007.

STRESS ON INCOME CONTINUES

Net interest income as a percentage of total assets increased from a revised level of 0.84% in 2007 to a weighted average of 0.95% in 2008 (see Table S5 and Chart S88).[2] This increase reflects the positive effect of a stabilisation of the euro area yield curve on banks' intermediation margins, as well as the increased importance of interest income as a main source of total operating income (and of other sources of income, especially trading, which was very weak in the first half of 2008). The interest margin from lending showed a sharp retreat, after having steepened in the latter half of 2007 (see Chart S94), while the deposit margin increased sharply in the first half of 2008, after having fallen throughout most of 2007 (see Chart S98). Furthermore, volume growth in loans, especially toward corporates, seems to have compensated for the negative trend in lending margins in the first half of 2008 (see Chart S93).[3] Part of the growth in loans to corporates is due to a drawdown of credit facilities, accounting for about €110 billion of loan creation in the euro area according to

2 The same holds true when expressing interest income as a percentage of risk-weighted assets, as it increased from 2.19% to 2.63% over this period.

3 There was also a substantial growth in lending to MFIs, but this probably reflects the sizeable securitisation undertaken by euro area MFIs in order to create collateral that can be pledged for the ECB's liquidity operations (see also Section 3.2).

market sources.[4] In the period ahead, a slowdown in loan growth may be expected, in line with weakening economic activity and tighter financing conditions (see Section 2). This would negatively impact on euro area banks' interest income.

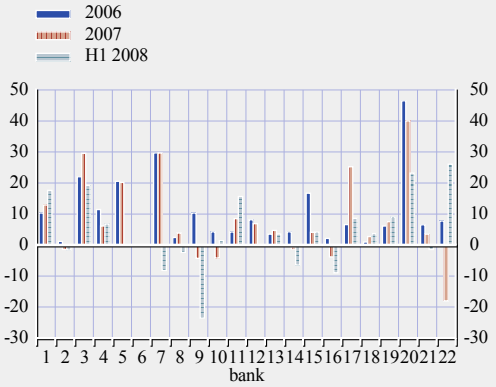
Fee and commission income remained the most important source of non-interest income for euro area LCBGs. The median share of this item in the net operating income of euro area LCBGs declined from 31.3% in 2007 to 24.7% in the first half of 2008, whereas the weighted average decreased from 31.4% to 28.9% (see Table S5).

The main impact of the financial crisis on LCBGs' net income in the first half of 2008 was on trading revenues, which fell as capital market conditions were very unfavourable, causing further substantial markdowns on structured finance portfolios. Expressed as a percentage of total operating income, trading income fell from 16.2% in 2007 to 9.0% in the first half this year (see Table S5). Trading income as a percentage of Tier 1 capital fell across virtually all LCBGs and was negative (i.e. there were outright trading losses) for seven of the 19 entities for which comparable data were available (see Chart 4.3). Median trading revenue as a percentage of Tier 1 capital decreased further from 6.6% in 2006 to 4.7% in 2007, and to 1.8% in the first half of 2008. Evidence from early-reporting banks suggests that the continued negative financial market climate in the third quarter led to further shocks to banks' trading income.

Financial crisis-related reductions in euro area LCBGs' net after-tax income amounted to €22 billion in the first half of the year, compared with charges of €23 billion for the whole of 2007. These relate to valuation changes on sub-prime and structured credit securities, leveraged loan commitments, commercial mortgage-backed securities (CMBSs), credit default swap (CDS) guarantor contracts and new loan impairment charges. Given the uncertain market environment, the impact of the crisis on euro area banks may thus linger on, so that further write-downs on structured products cannot be ruled out. This may further adversely affect euro area LCBGs' earnings when these securities are sold, or if they become permanently impaired. The latter prospect has become increasingly likely, as documented in Section 3 and corroborated by the figures on third-quarter financial results available from early-reporting banks.

Chart 4.3 Trading revenue for euro area large and complex banking groups

(2006 – H1 2008; percentage of Tier 1 capital)



Sources: Bureau van Dijk (Bankscope), individual institutions' financial reports and ECB calculations.

CREDIT COSTS RISING

Credit costs rose further from 0.09% of total assets in 2006 to 0.11% in 2007, and to 0.17% in the first half of 2008. Chart S89 shows that there was also a pronounced upward shift in the distribution of loan impairment charges. This suggests that the credit quality of euro area LCBGs' loan portfolios has been deteriorating (see also Section 4.2). According to Chart S96, this is due mainly to an increase in impairments on consumer credit and other lending to households, as well as to slightly higher impairments on loans to corporates. Banks with charges of over 0.2% of total assets account for an increasing share of euro area LCBG assets. In 2006, they held 0.14% of those assets. In 2007, this share rose to 0.17% of assets and, by mid-2008, it amounted to 0.30% of assets (see Chart S89).

4 See JPMorgan Chase & Co. "Europe Credit Research", July 2008.

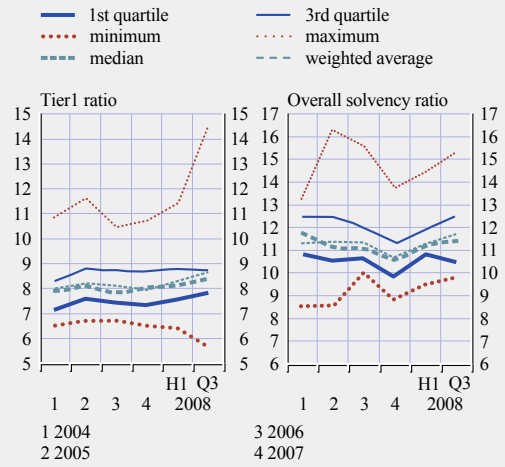
Operating efficiency, as measured by the cost-to-income ratio, deteriorated substantially in the first half of 2008 as the growth in operating income was outpaced by the rise in operating costs. The weighted cost-to-income ratio increased from 63.7% (excluding one extreme outlier) in 2007 to 78.6% in the first half of 2008, mainly because of the reduction in the operating income of some LCBGs. At the same time, however, the distribution of cost-to-income ratios became more skewed, with both extremely cost-efficient and cost-inefficient LCBGs growing at the expense of the middle group. The more poorly performing LCBGs' cost-to-income ratios increased from 69.6% in 2007 to 90.3% in the first half of 2008, while the more efficient LCBGs saw a stabilisation of their ratios at about 55% over the same period (see Chart S90 and Table S5).

CAPITAL RATIOS ROSE

Euro area LCBGs' regulatory capital ratios increased in the first nine months of 2008, despite the reductions in retained income that stemmed from their lower profitability. The weighted average Tier 1 capital ratio strengthened from 7.9% at the end of 2007 to 8.3% in the first half of 2008 (see Table S5 and Chart 4.4), and to 8.7% for a smaller sub-sample in the third quarter of 2008. Similarly, the overall solvency ratio increased slightly from 10.6% to 11.3% in the first half of 2008, and to 11.7% for a smaller sub-sample in the third quarter of 2008. For both ratios, the solvency of the most poorly performing institutions improved in 2008, after weakening in 2007. This indicates that their shock-absorption capacity has improved. The frequency distribution of the capital ratios, too, shifted upward in the year to date, especially during the third quarter (see Charts S91 and S92).

Chart 4.4 Tier 1 capital and overall solvency ratios for euro area large and complex banking groups

(2004 – Q3 2008; percentage)



Sources: Bureau van Dijk (Bankscope), individual institutions' financial reports and ECB calculations.
Note: Q3 2008 figures are available for, respectively, 14 and 13 LCBGs out of 22.

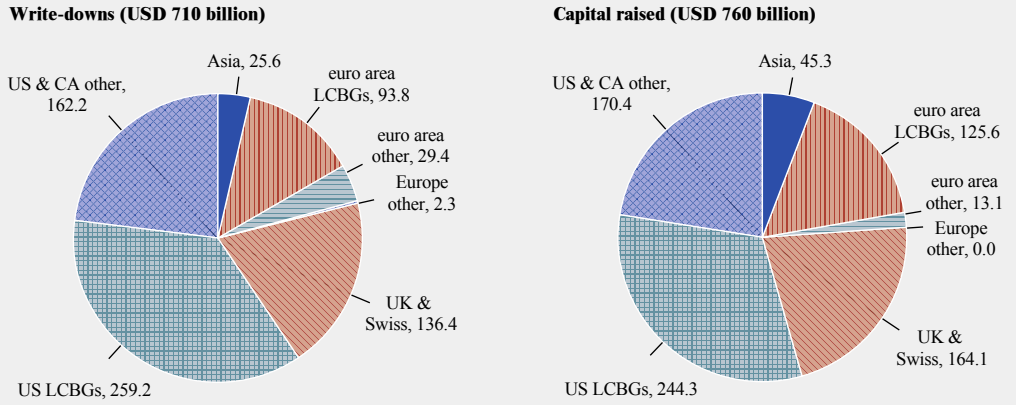
One reason for the improvement in regulatory capital ratios was a decline of 6% in risk-weighted assets in the first half of 2008, following a record increase of 22% in 2007. While this was largely due to individual banks' discretionary policies aimed at de-risking balance sheets, it also, to some degree, reflected the impact of both the implementation of Basel II and prudential filters. It should also be noted that some of the newly attracted capital came in the form of hybrid financing and is reaching prudential limits.

At the same time, total assets continued to grow, albeit only moderately, by 3% in the first half of 2008, after a 13% rise in 2007. This suggests that most euro area LCBGs seem to have stopped arbitraging to maximise business opportunities by building up assets that were treated leniently under the BIS regulatory capital regime, as they need to deleverage and as the funding of asset growth has become prohibitively expensive (see also Box 9).

Another factor contributing to the general improvement of regulatory capital ratios, despite challenging business conditions, was a broad-based raising of capital in 2008 (see Chart 4.5). In gross terms, euro area LCBGs raised some USD 125 billion in the year to date (about 15% of their capital base), USD 55 billion of which in the fourth quarter alone, partly with public money. This might, in part, have reflected a process of catching up with their global peers as they had not raised any capital in the

Chart 4.5 Banks' total write-downs and capital injections by region

(Q2 2007 – 25 Nov. 2008; USD billions)



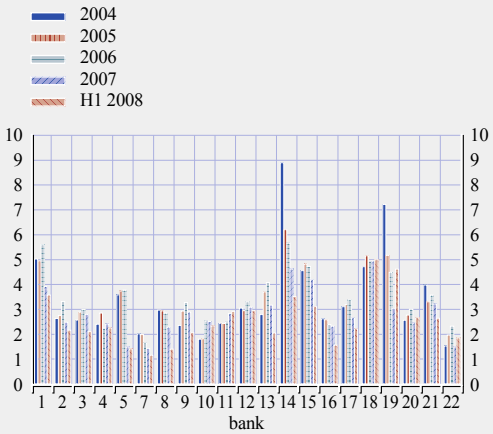
Sources: Bloomberg and ECB calculations.
Note: Write-downs include reductions in after-tax income due to valuation changes in sub-prime and structured credit securities, leveraged loans commitments, commercial mortgage-backed securities, CDS guarantor contracts and new loan impairment charges. Figures are pre-tax and net of any relevant financial hedges and off-setting gains unless the firm does not report these factors. Capital raised also includes asset sales and divestitures.

previous year when the turmoil first affected their earnings and capital buffers. These figures show that, euro area LCBGs as a group have now covered the crisis-related write-downs with capital injections.

However, it remains to be seen whether the capital ratios of euro area LCBGs are adequate.

Chart 4.6 Ratios of tangible equity to assets for euro area large and complex banking groups

(2004 – H1 2008; percentage)



Sources: Bureau van Dijk (Bankscope), individual institutions' financial reports and ECB calculations.

In September and October 2008, market participants singled out banks that had capital ratios and liquidity buffers below peer levels. In other words, it seems that those banks whose ratios are deemed not to be high enough are being forced to raise them on account of very low investors' risk appetite. Some market reports indicate that banks will need a core Tier 1 capital ratio of at least 8% in order to satisfy market participants of the adequacy of their buffers.

Recently, financial markets have also started to focus on other measures of capital strength, such as tangible equity-to-assets or Tier 1 capital-to-tangible assets ratios. On this score, some euro area LCBGs may need to increase their capital buffers further, as they are at the lower end of the distribution among their global peers (see Chart 4.6). [5]

5 Differences between US GAAP and IFRS accounting rules are said to distort the comparability of leverage ratios between US and European banks. However, the difference in leverage ratios is only partially explained by different accounting standards. The difference in balance sheet size is very small for most banks. European LCBGs' leverage ratios are smaller under IFRS, but remain well below those of any of the US LCBGs.

Since raising capital in the market and selling assets at non-distressed prices have become increasingly difficult (see also Section 4.3), an alternative way of improving capital ratios could be through a reduction of dividend payouts, as has already been announced by several LCBGs. Box 9 finds that, based on second-quarter 2008 Tier 1 capital ratios, the potential impact on LCBG capital ratios of cutting dividends would be up to 50 basis points.

Box 9

RESTORING THE BALANCE SHEETS OF LARGE AND COMPLEX BANKING GROUPS IN THE EURO AREA: DIVIDEND CUTS AND ASSET DISPOSALS

The losses suffered by euro area LCBGs as a result of the financial turmoil have forced many of them to contain risks by reducing the leverage on their balance sheets. When doing so, banks can follow three different options (or any combination thereof). They can raise new capital, they can reduce their dividend pay-out ratios, or they can shed assets. This box focuses on the latter two channels of deleveraging, *i.e.* on dividend policies and asset disposals. In so doing it provides some estimates of the potential impact on leverage should euro area LCBGs choose one of these options, rather than raising new equity capital, to restore their balance sheets.

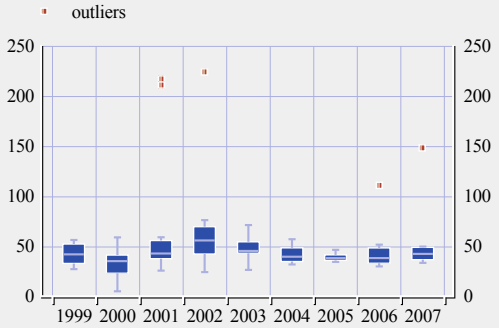
Regarding dividend policies, banks typically keep dividend payment levels steady in order to meet investors' expectations of stable dividend flows and to avoid negative signalling effects. So far this year, there have been only a few announcements of banks' cutting dividends, and even these were mostly by banks located outside the euro area. By contrast, some euro area LCBGs have even continued to increase their dividend payments. Moreover, some banks funded dividend payouts with dilutive share offerings or other expensive forms of equity financing, such as higher-yielding preference shares. In the face of an eroding capital base, such policies do not appear to be sustainable. For a group of 14 euro area LCBGs, dividend payouts amounted to €31 billion in 2007, while their additions to reserves in the form of retained earnings were €39 billion. This compares with €45 billion of capital that they raised by September this year.

Most euro area LCBGs maintained a dividend payout ratio of around 45% over the last few years (see Chart A). Notably, however, banks that were hardest hit by the financial turbulence in 2001-02 kept up their dividend payment levels while their earnings eroded, leading to a substantial increase in the payout ratios in those years.

Looking forward, given the difficulties encountered by many LCBGs in raising capital from private sources, dividend cuts may be a viable alternative to strengthen capital bases. A computation using data from 2007 shows that a total suspension of dividend payments – an extreme scenario – would have increased euro area LCBGs' Tier 1 capital ratios by 64 basis

Chart A Dispersion in dividend pay-out ratios for euro area large and complex banking groups

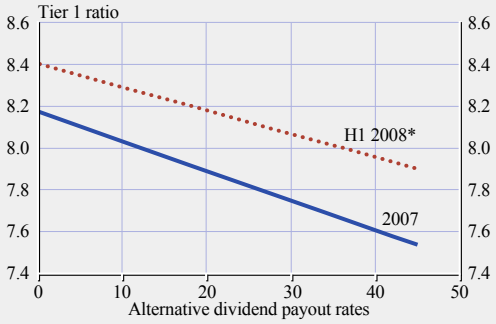
(percentage; maximum, minimum, interquartile distribution and median)



Sources: Bloomberg and ECB calculations.
Note: The sample consists of 14 euro area LCBGs. Dividend payout ratios larger than 100% indicate that LCBGs drew on reserves to pay out dividends in excess of current earnings.

Chart B Effects of alternative dividend pay-out rates on euro area large and complex banking groups' Tier 1 capital ratios

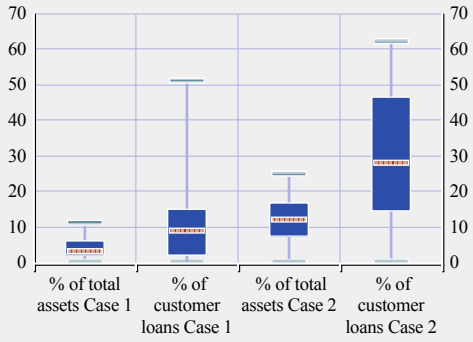
(percentage)



Sources: Bloomberg, individual institutions' financial reports and ECB calculations.
Note: The sample consists of 14 LCBGs.
* H1 2008 profits have been annualised.

Chart C Estimated scope for deleveraging by euro area large and complex banking groups

(percentage; maximum, minimum, interquartile distribution and median)



Sources: Bureau van Dijk (Bankscope), Bloomberg and ECB calculations.
Notes: Case 1 refers to deleveraging to pre-turmoil leverage multiples (calculated as risk-weighted assets over total capital); Case 2 refers to deleveraging to a uniform multiple of 7.5 applied to all institutions.

points in 2008, from 7.54% to 8.17% (see Chart B). Using earnings data for the first half of 2008, a similar dividend payout policy could have boosted Tier 1 capital ratios by up to 50 basis points, from 7.90% to 8.40%.

It must be borne in mind in this context that current dividend yields have reached historical peaks, given the dramatic decline in bank stock prices over the past few months. Therefore, a reduction of dividends to levels that ensure a long-term average dividend yield of about 3-4% could be seen as a reasonable measure. Moreover, some banks may also be forced to cut dividends in order to fulfil requirements of certain government rescue plans or if their capital ratios fall below a certain predefined level. In the long run, dividend cuts might even contribute to avoiding the need for state recapitalisation and could help banks in retaining their independence.

As regards deleveraging by means of asset disposals, assuming that LCBGs aim at reducing their leverage ratios from the current elevated levels, it is possible to calculate the extent of balance sheet shrinkage that would be required to restore the balance sheets without raising additional capital or cutting dividends.[1] Chart C shows the distribution of the estimated scope for deleveraging for individual euro area LCBGs, both as a share of these institutions' total assets and as a share of their customer loans, after accounting for the capital already raised by some institutions. Two alternative cases are considered. In the first case, LCBGs would bring their leverage multiples back to the levels that prevailed prior to the turmoil (the average multiple, defined as risk-weighted assets divided by total capital, for the euro area LCBGs was 8.95 in mid-2007). In the second case, they would converge on a lower leverage multiple of 7.5, applied to all institutions.[2]

1 For details of the estimation, see Greenlaw, Hatzius, Kashyap and Shin, "Leveraged Losses: Lessons from the Mortgage Market Meltdown", paper presented at the US Monetary Policy Forum Conference, 2008. The authors estimate that, with the information available at the end of February 2008, the potential deleveraging in the entire US financial sector would have amounted to just under USD 2 trillion.

2 Note that leverage multiple is defined here as the inverse of the total capital ratio. Therefore, the leverage multiples quoted in the text would correspond to total capital ratios of 11.1% and 13.3% respectively.

All other things being equal, in order to reach the pre-turmoil level of its leverage multiple, the median LCBG would have to reduce its balance sheet by an amount that corresponds to 3.1% of its total assets, or by 8.9% of its total customer loans.

Measured in euro, the total LCBG deleveraging would amount to around €540 billion in this case. To reach the 7.5 leverage multiple, the amount of deleveraging by the median institution would have to be 11.8% of total assets, or 27.9% of customer loans. These figures are large and, should they crystallise, would imply a significant contraction of credit to the private sector.

All in all, as many banks may be reluctant to excessively reduce their dividend payouts or to aggressively shed assets in the current difficult market conditions, there is a strong case for euro area LCBGs to raise new equity capital as a complementary means of reducing leverage in their balance sheets. When equity capital cannot be raised from private sources at a reasonable cost, banks in the euro area should take full advantage of the resources that were made available by various governments in the fourth quarter of 2008.

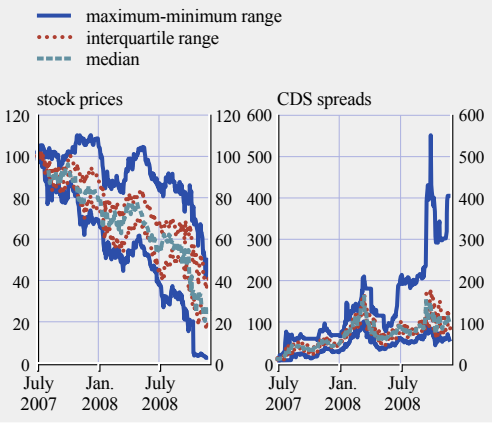
SEPTEMBER-OCTOBER CRISIS HIT EURO AREA BANKS

The turbulence that had hit the US banking markets (see Section 1.3) spilled over to the European banking markets in late September, triggered first by US Congress' initial rejection of the Troubled Assets Relief Program (TARP) and then amplified by the revelation of counterparty losses on exposures to Lehman Brothers. However, falling bank stock prices and other market indicators suggest that this was something that market participants had been expecting to happen for a long time (see Chart 4.7 and also Section 4.3).

In the Benelux countries and in France, two large cross-border banking groups came under intense market pressure as a consequence of perceived liquidity and capital shortages. In Germany, a large commercial property lender was pressed over refinancing problems with its Irish subsidiary. Swift and coordinated policy actions – a reiteration of deposit insurance guarantees and capital injections by the governments of these banks' main markets – helped to stabilise their condition. Smaller euro area countries, such as Ireland, also suffered severe stress in their domestic banking sectors amid fears about banks' funding and real estate exposures. Again, swift and drastic policy actions – in the form of increased deposit insurance limits and, subsequently, a government guarantee on all banks' deposits – helped prevent the materialisation of widespread systemic risk. In addition, several European stock exchange regulators followed the SEC's ban on short sales of financial stocks in an attempt to clamp down on downward price speculation, although this did not prevent a further drop in bank stock prices (see Chart 4.7). However, as the crisis of confidence lingered on, pressure on both bank stock prices and CDS spreads rose anew, forcing new emergency rescue packages to be adopted for major Benelux banks. Several other euro area banks likewise had to shore up their capital base,

Chart 4.7 Dispersion of stock prices and CDS spreads for euro area large and complex banking groups

(July 2007– Nov. 2008; stock price index: July 2007 = 100; five-year senior CDS spreads in basis points)



Sources: Bloomberg and ECB calculations.

or took recourse to the government for capital injections. The market environment ultimately became characterised by extraordinarily high uncertainty and self-fulfilling dynamics as regards banks' viability. Uncertainty started to weigh on all financial institutions, especially on those with perceived large short-term liquidity needs, a heavy dependence on wholesale funding, below-average capital buffers and large remaining structured credit exposures.

Against the backdrop of a continuing financial crisis situation, the ECB, together with central banks of major industrialised countries, agreed on 8 October to a coordinated interest rate reduction. Euro area finance ministers held a summit on 12 October, at which they committed themselves to a coordinated effort to bolster domestic banking systems with rescue packages for financial institutions that totalled €2 trillion. Furthermore, central banks agreed to expand existing international swap arrangements to offer banks unlimited US dollar funds at short and medium-term maturities. The ECB also undertook to temporarily expand the collateral framework, as detailed in Section 3. Box 10 contains a more detailed description of these action plans, and some of the crisis management coordination mechanisms are detailed in Special Feature A.

Box 10

MEASURES TAKEN BY GOVERNMENTS AND CENTRAL BANKS TO PRESERVE THE STABILITY OF BANKING SYSTEMS

Against the background of the intensification of the financial market stresses in October 2008, a number of governments and central banks across the globe took extraordinary measures to preserve the stability of banking systems.[1] These actions, which should be distinguished from the prudential measures that had been initiated earlier and are discussed in detail in Special Feature A of this FSR, range from offers of government guarantees for bank debt issuance and retail deposits to the provision of additional capital resources to distressed banks. This box briefly discusses the measures taken in different jurisdictions, both in the euro area and in other major economic areas. A summary of these measures is given in the table below.

Capital injections. With respect to the government-assisted recapitalisation of banks, the euro area guideline for national rescue packages, the rescue plan in the United Kingdom and the Capital Purchase Program under the Emergency Economic Stabilization Act (EESA) in the United States all contain broadly similar concepts of injecting government cash into banks and taking preferential shares in return. In the euro area, public capital injections of € 82 billion had been announced by the cut-off date of this FSR.[2]

Asset purchases or swaps. In past episodes of distress, the creation of a government-owned asset management company to buy and wind up distressed loans was a policy measure often applied. Within the euro area, Greece, Spain and Italy have announced that they are prepared to help banks by purchasing some of their assets or by converting them into government obligations. In the

1 In the euro area, these measures followed the decisions taken at the Eurogroup summit in Paris on 12 October, where the euro area countries agreed on a concerted action plan with the aim of restoring confidence in the markets and promoting the proper functioning of the financial system. A few days later, on 15 and 16 October, the EU summit endorsed the principles laid down in the Paris declaration. The national measures were taken in accordance with the agreed principles on improving the liquidity and solvency conditions for financial institutions.

2 A special feature in some jurisdictions, such as the United Kingdom, was to require banks to raise new capital with the objective of their reaching a certain capital ratio. In the absence of private investors willing to provide the capital necessary to fill the gap, an injection of public capital had to be accepted. This could be effected by the government underwriting the new shares issued.

United States, the original idea of the USD 700 billion Troubled Assets Relief Program (TARP) to support illiquid markets of mortgage-related assets was eventually abandoned and funds were announced to be used mostly for capital injections. However, there are several other programmes in place in the United States to purchase troubled securities including loans, MBSs and ABCP from the market.

Guarantees on bank liabilities. To mitigate the pressure on banks' funding, the EU decided to raise the minimum guarantee to €50,000 per deposit account. Higher limits, blanket guarantees of all deposits – or even most of the banks' liabilities – have been established in several countries. Furthermore, there have been attempts in most jurisdictions to unfreeze the credit market by offering temporary government guarantees on all newly issued debt, against a fee.

Table A Published national rescue packs with explicit commitments

(EUR billions)

Country	Capital injection	Asset purchases/ swaps	Guarantees/ loans/credit lines
Euro area			
AT	15	-	85
BE	13	-	-
CY	-	-	-
DE	80	-	400
ES	-	50	100
FI	4	-	50
FR	40	-	320
GR	5	8	15
IE	-	-	485
IT	-	40	-
LU	3	-	-
NL	37	-	200
PT	4	-	20
SI	-	-	8
Other EU			
HU	1	-	1
SE	2	-	150
UK	61	-	306
Other Europe			
CH	4	42	-
NO	-	-	40
Other			
US	683	1,318	1,559

Finally, figures quoted in this box should be interpreted with caution, as they represent maximum commitments, rather than amounts that are likely to be actually spent. Furthermore, the various commitments are rather different in nature and are not necessarily comparable with each other. It should also be noted that several additional measures have been taken by governments and central banks to mitigate the stresses. These include further enhancements in the provision of liquidity by central banks, restrictions on short-selling, modifications in the rules for fair-value accounting that allow banks to re-classify assets previously held in trading books as banking book assets and, in some countries, various programmes to contribute to a restructuring of individual homeowners' mortgage loans. It is important that the banking sector takes fully into account these significant support measures adopted by governments to deal with the financial turmoil. These measures should be supporting trust in the financial system and should help to prevent undue constraints in the credit supply to companies and households.

4.2 BANKING SECTOR OUTLOOK AND RISKS

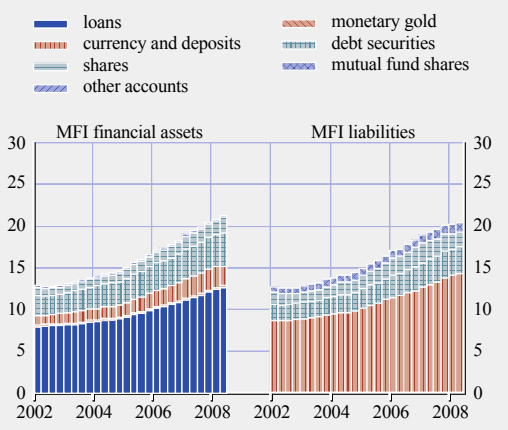
EARNINGS RISKS

As discussed in detail in the previous sub-section, since the publication of the June 2008 FSR, the financial turmoil has continued to have a profoundly adverse impact on the earnings that euro area LCBGs generate from their trading book assets. The possibility of further mark-to-market losses, should it crystallise, will exert a negative drag on the profits of these financial institutions going forward. It may also lead to a re-assessment of business models by some of these institutions. The negative outlook for future earnings growth will, all other things equal, also have an adverse impact on LCBGs' future solvency ratios by reducing the rate of organic capital growth.

The composition of the asset side of a bank's balance sheet provides some information about prospective vulnerabilities in respect of its

Chart 4.8 The balance sheet of the banking sector in the euro area

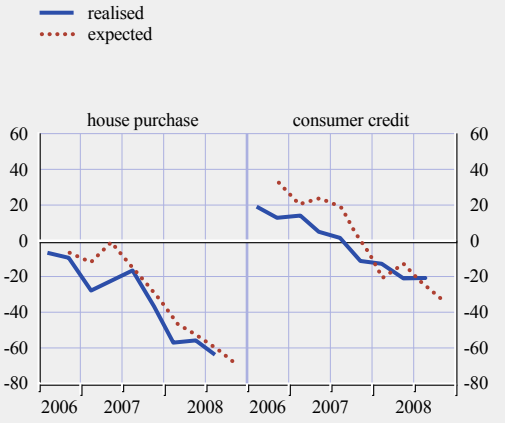
(Q1 2002 – Q2 2008; EUR trillions)



Source: ECB.

Chart 4.9 Changes in demand for bank loans to euro area households

(Q3 2006 – Q4 2008; net percentages of banks reporting a positive contribution to demand)



Source: ECB.

future earnings prospects. A decomposition of the evolution of aggregate euro area MFI assets shows that, since 2005, the share of euro area banks' holdings of equities and debt instruments in their total assets has grown slightly faster than that of their loans to customers (see Chart 4.8). Nevertheless, loans still account for more than half of the euro area banking sector's total assets. This indicates that the main source of earnings risk for the entire banking sector is the banking book (mainly lending activity), but that the trading book (investment securities) is a large and growing source of earnings risk.

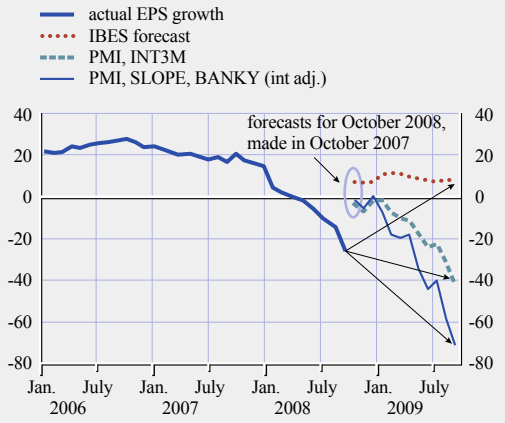
Regarding the outlook for banking book activities, the persistent stresses on the financial sector, the ongoing slowdown in the pace of economic growth in the euro area, the volatile yield curve environment and a deceleration of growth in risk-weighted assets all point towards lower revenue growth and challenges for LCBGs' future earnings prospects. Information from the ECB's bank lending surveys of July and October 2008, which cover a broader population of banks than the LCBGs, suggests that the demand for loans to both households (see Chart 4.9) and the corporate sector has already declined significantly and that banks expect it to weaken further in the coming months. Slower growth in lending volumes will also depress the growth in fees and commission income that is reaped from core banking activities. Where individual LCBGs are concerned, those with lending activities that are concentrated in countries that face the highest risk of an economic slowdown are likely to be the most vulnerable in terms of a decline in revenues from new lending.

The possibility of persistently high funding costs in the near future, which will be discussed in more detail below, provides an additional negative drag on LCBGs' profits across the board and will probably exert downward pressure on the future growth of balance sheets for some time to come. To compensate for the reduced income, banks may have started to pass the higher funding costs on to their borrowers (see Chart S49).

Summarising the views of financial market participants, Chart 4.10 illustrates market analysts' forecasts for future earnings growth over the next 12 months for banks included in the Dow Jones EURO STOXX banking index, taken in October 2008 and spanning the period up to October 2009. For purposes of comparison, it also includes projected paths derived from two fundamentals-based earnings growth

Chart 4.10 Earnings forecasts for banks in the Dow Jones EUROSTOXX index

(Jan. 2006 – Oct. 2009; percentage change per annum)



Sources: Thomson Financial Datastream and ECB calculations.
Note: The two predictive regression models (with a forecasting horizon of 12 months) are constructed as follows. The first model includes the euro area purchasing managers' index of business activity (PMI) and the three-month interest rate (INT3M) as predictors, while the second model has the PMI indicator, the slope of the yield curve (the ten-year rate minus the three-month rate) and the IBOXX euro area index of bank bond yields (BANKY) as predictors. The dependent variable is the annual growth in banks' earnings-per-share.

models for the same time period. It can be seen that, while the analysts' forecasts continued to predict positive earnings growth for 2008 and 2009, the model-based forecasts predicted zero or negative earnings growth rates as from as early as October 2007. Since early 2008, the model-based outlook has deteriorated further, and the forecasts taken on October 2008 indicate a decline of between 40% and more than 70% in profits over a one-year horizon.

The negative outlook for LCBGs' near-term revenue growth should be seen against the background of the exceptionally strong earnings growth that most of these institutions had recorded over several years up to the end of the first half of 2007. Nevertheless, given the adverse impact that the protracted financial market stresses have already had on banks' financial buffers, the outlook for lower profits and a slower organic growth of LCBGs' capital bases will contribute negatively to the future financial health of these institutions.

CREDIT RISKS

Since the finalisation of the June 2008 FSR, the outlook for the credit quality of the loans extended to the private sector by euro area LCBGs' has deteriorated. This is due to the slowdown in economic growth, volatile commodity and energy prices, persistently difficult financing conditions and, in some countries, the decline in residential and/or commercial real estate prices. All of this has contributed to the rise in credit costs as reported in Section 4.1.

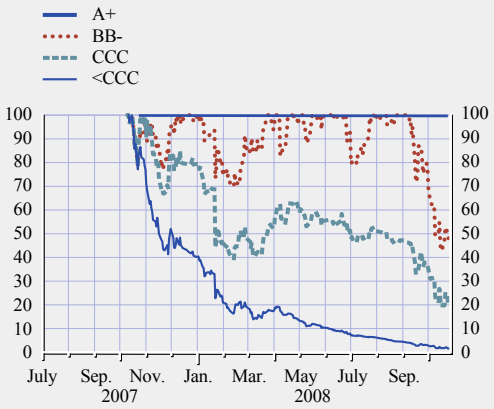
Reacting to the less favourable operating environment, banks responding to the ECB's bank lending surveys of July and October 2008 indicated that they had substantially tightened their credit standards for new loans to both households and the non-financial corporate sector (see Charts S102 to S105). While this will have a favourable impact on the credit quality of the flow of new loans over time, it may have an adverse impact in the nearer term on the credit quality of those borrowers who have to roll over their credit lines at potentially less favourable terms.

On the corporate credit side, euro area banks' retrenchment from risk-taking has already become visible in leveraged lending activities. The volume of newly extended leveraged buyout (LBO) loans declined sharply in 2008, to just above €47 billion (in the months from January to October).[6] This corresponds to around one-third of the LBO loan volume in the same period a year earlier. In addition, about one-third of the 2008 issuance volume was accounted for by transactions mandated in 2007, which the banks were committed to underwrite. Difficulties in syndication processes are likely to have put pressure on banks' funding costs and capital requirements, as high risk-weighted assets have had to be warehoused longer than expected on banks' balance sheets. The decline in institutional investors' risk appetite and the

6 See Standard & Poor's, "Leveraged Commentary & Data", November 2008.

Chart 4.11 Value index of credit default swaps on leveraged loans

(July 2007 – Nov. 2008; par value = 100)



Source: JP Morgan Chase & Co.

repricing of credit risks in the secondary markets for loans has led some banks to distribute the warehoused loans at substantial discounts, incurring losses in the process. Indeed, forced selling by leveraged investors is likely to have contributed to further drops in the already depressed prices in the US and European secondary loan markets (see Chart 4.11).

Investors' appetite for these assets – to a large extent, accounted for by collateralised loan obligation (CLO) managers – is likely to have deteriorated further in the light of the weak macroeconomic and financial conditions that are affecting the cash flows and default risk of highly leveraged firms. Meanwhile, such firms need to refinance large amounts of leveraged loans and high-yield bonds. Markets observers estimate that the refinancing need could exceed USD 500 billion, at the global level, between 2008 and 2010.[7]

Another potential near-term source of credit risk for euro area LCBGs relates to their commercial property exposures. Since such exposures are not disclosed consistently across banks, and given that conditions on the commercial property markets in some euro area countries are currently deteriorating (see Section 2.3), the Banking Supervision Committee carried out a survey to assess the magnitude of EU banks' exposures to commercial property markets.[8] The survey results revealed that many euro area banks have commercial property-related lending exposures that are substantial in terms of both total assets and total loans. On average, commercial property-related loans accounted for 5.2% of the total assets of the EU banks surveyed, and for 10.4% of their total loans, at the end of 2007.[9] Furthermore, the data collected suggest that, in general, the share of commercial property-related loans in euro area banks' total lending has gradually been increasing over the past few years.

Looking ahead, a significant increase in default rates of highly leveraged companies or a fall in commercial property prices has the potential to restrict the amount of lending to LBO firms or to commercial property investors. In addition, recent or future movements in corporate earnings or returns on commercial property investment, and decreases in firm and commercial property valuations, could have the potential to put financial constraints on banks that extend loans for such purposes or invest in related assets, and could contribute to a further need for write-downs.

More generally, quantitative insights into future patterns of credit risks in LCBGs' outstanding loan portfolios can be obtained from estimated credit value-at-risk (VaR) measures.[10] These

7 See Fitch Ratings, "Loan issuance boom shifts refinancing risk strongly to loan markets", Credit Market Research, July 2007.

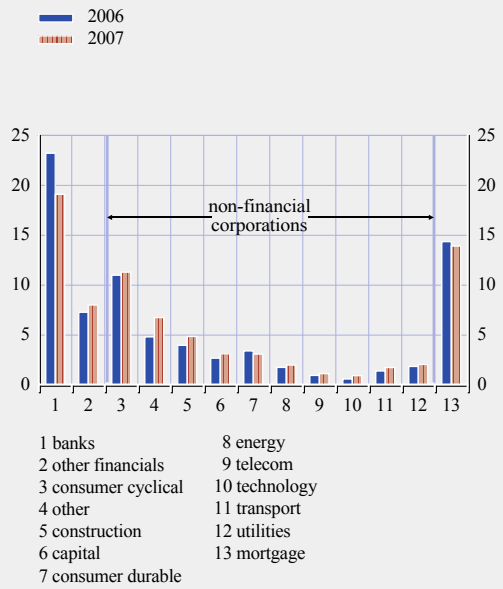
8 The survey was conducted in mid-2008 and comprised a set of quantitative and qualitative questions. In total, 16 countries submitted replies to the quantitative part of the survey.

9 It should be noted, however, that large differences exist across surveyed banks with respect to their involvement in commercial property lending. Furthermore, it should also be noted that, since the survey was targeted at those banks that are most active in commercial property lending, the above-mentioned average ratios for the banks surveyed do not necessarily reflect the share accounted for by commercial property lending in the euro area banking system.

10 Credit VaRs, which are a standard tool applied by banks' risk managers, rating agencies and prudential supervisors, typically indicate the amount of economic capital that is needed to cover 99.9% of unexpected losses in a low-probability 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 the sufficiency of Tier 1 capital to absorb the losses that would materialise in such a scenario.

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

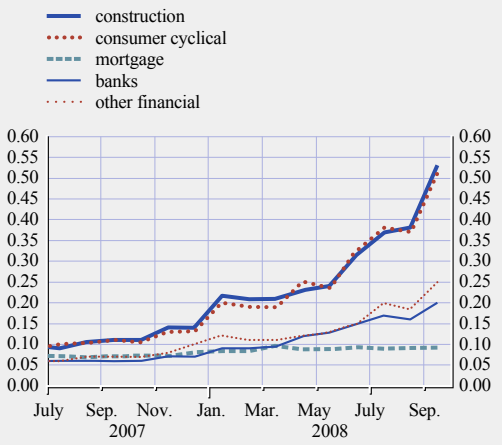
(percentage of total assets)



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.

Chart 4.13 Median unconditional expected default frequencies (EDFs) for selected sectors in the euro area

(July 2007 – Sep 2008; percentage probability)



Sources: Moody's KMV and ECB calculations.
Note: The EDF provides an estimate of the probability of default over the following year. Due to measurement considerations, the EDF values are restricted by Moody's KMV to the interval between 0.01% and 35%.

can be calculated by linking the probabilities of default (PDs) of banks' borrowers to publicly available data on euro area LCBGs' exposures to different types of loans. [11]

Data on individual LCBGs' loan exposures at the end of 2007 reveal that these institutions had their largest lending exposures to other banks and financial intermediaries (around 20%), mortgage loans (around 15%), loans to the consumer goods sector (around 14%) and loans to other financial institutions (around 9%). Exposures to household mortgage loans decreased in 2007 in comparison with the previous year, while exposures to the cyclical consumer goods, other corporate and construction sectors increased (see Chart 4.12). [12]

Chart 4.13 plots the dynamics of sector-specific PDs for those corporate sectors vis-à-vis which LCBGs have relatively large lending exposures. In the first three quarters of 2008, the PDs for the cyclical consumer goods and the construction sectors increased significantly, while the PDs for banks, other financial institutions and also the mortgage sector experienced more moderate increases.

These empirical PDs and data on the composition of LCBGs' loan portfolios can be used to calculate a baseline scenario for credit VaRs. In addition, in order to analyse the sensitivity of the credit VaRs to low-probability but plausible

11 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, and ECB, "Assessing credit risk in the loan portfolios of euro area large and complex banking groups", *Financial Stability Review,* December 2007.

12 The geographic distribution of loan exposures across LCBGs reveals that, on average in 2007, around 75% of the loans extended by LCBGs were to borrowers located in the euro area countries. At the same time, 7.5% of total lending was, on average, 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.

macro-financial shocks, hypothetical adverse scenarios for borrowers' PDs can be calculated and compared with the baseline scenarios where the PDs remain unchanged.[13] The scenarios for PDs are broadly based on vulnerabilities that are identified in other parts of this FSR, and are implemented using the modelling framework referred to above. The following scenarios were applied:

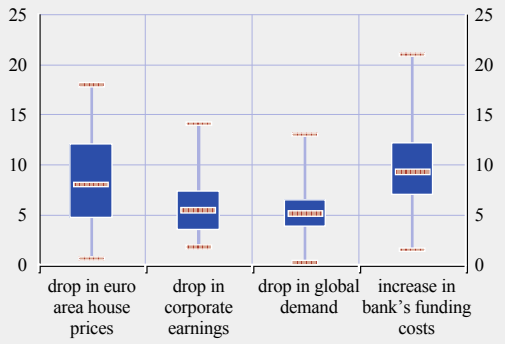
(i) a decrease in average euro area house prices (see Section 2.4);
(ii) a decrease in corporate profits in the euro area (see Sections 2.2 and 2.3);
(iii) a decrease in global demand (see Sections 1.1 and 2.1); and
(iv) an increase in LCBGs' funding costs that would limit their ability to lend to the private sector (see Sections 3.1 and 3.2, as well as subsequent parts of this section).

In scenario (i), a decrease of 12% in average euro area house prices was considered. This drop was obtained by using the lower confidence bound of the simple univariate 95% interval forecast for euro area house prices. This means that the scenario has a 2.5%, i.e. very low, probability of materialising by November 2009. Scenario (ii) incorporates a decline in euro area corporate sector profitability in the event of a severe downturn in the credit cycle. This low-probability scenario is based on the 2.5% lower confidence bound of the forecast of the PMI for various sectors in the euro area. This forecast puts the fall in profits at 85% by November 2009. Scenario (iii) is based on a decrease in global demand where the year-on-year growth rate of US GDP would fall by 1.5% by November 2009, again with 2.5% probability. Finally, scenario (iv) incorporates an overall increase in euro area LCBGs' funding costs, which will, again with a probability of 2.5%, lead to a rise of 5.5% in aggregate funding costs by November 2009.[14]

The impact of scenarios (i) to (iv) on borrowers' PDs vary from sector to sector. Overall, however, the sectors that are more sensitive to the economic cycle tend to be affected most. In terms of changes in non-financial corporate sector PDs, scenario (iii) appears to be the most severe, followed by scenarios (ii) and (iv).

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

(percentage of Tier 1 capital; maximum, minimum, interquartile distribution and median)



Sources: Individual institutions' financial reports and ECB calculations.

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 rather heterogeneous across both scenarios and individual LCBGs. Chart 4.14 plots these changes by showing – on the vertical axis – the changes from the baseline scenario in the estimated credit VaRs relative to the individual LCBGs' Tier 1 capital ratios. The median increase in credit risk corresponds to less than 10% of Tier 1 capital over all scenarios. In some cases, the increases can be quite large, however, reflecting the sensitivity of individual institutions to particular types of stress on account of the sectoral composition of their loan books.

For those LCBGs for which the baseline credit VaRs are the highest, i.e. those whose loan books show the highest risk profiles, some of these

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

14 The banks' funding cost index is calculated as the weighted average of the cost of quoted equity and market-based debt for banks. It should be noted that, given the already elevated level of funding costs that prevailed in November 2008, this case corresponds to rather significant stress.

low-probability scenarios could, if they were to materialise, imply problems in terms of their solvency ratios. In addition, should several of the above scenarios materialise simultaneously, the outcomes would be more severe for most institutions in this group.[15]

MARKET-RELATED RISKS

The market risks in euro area LCBGs' banking and trading books are measured by market VaR figures. Since the publication of the June 2008 FSR, full year 2007 data on market VaRs have become available for these institutions. These data show that market-related risks play an important role in the overall risk profiles of these institutions. Indeed, on average, 25% of euro area LCBGs' Tier 1 capital was allocated to interest rate risks related to debt instruments, 26% to equity investment-related risks and 7% to risks related to foreign exchange (FX) exposures (see Chart 4.15).

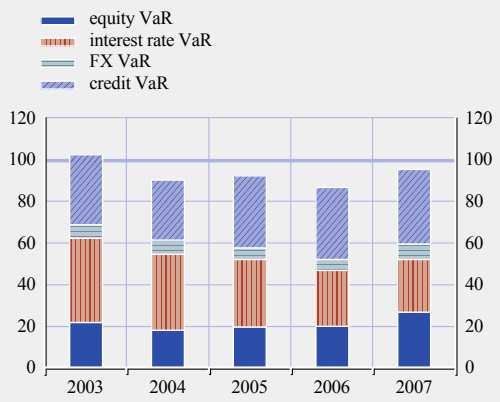
Of these market risk categories, equity and FX VaRs increased, on average, in comparison with the year before, most probably reflecting the increasing volatility in these markets in the second half of the year.[16] However, even if the market VaRs reported as a proportion of Tier 1 capital increased, on average, in 2007, they – together with credit VaR measures – did not exceed the levels of Tier 1 capital. It is worth noting, however, that for some individual LCBGs, the mark-to-market losses on securities investments that materialised in the first three quarters of 2008 probably exceeded the market risk VaRs that were calculated at the end of 2007.

With respect to the individual market risk components, the interest rate risk for banks is related mainly to developments in the shape of the yield curve, which has implications for income derived both from the banking books and from fixed income assets held in the trading books. Where the former is concerned, a flatter yield curve depresses banks' income from maturity transformation business. Over the past few years, banks have increasingly hedged against this risk by moving to short-term variable rate loans and, therefore, transferring the interest rate risk to their customers. With regard to the latter, banks tend extensively to hedge their fixed income portfolio holdings by using interest rate derivatives. The financial turmoil has shown, however, that for the more complex instruments, such as asset-backed securities (ABSs), which also include elements of credit risk, interest rate derivatives are not an adequate tool for hedging against all relevant market risks.[17]

Reflecting the problems in the interbank money markets, at the time of the cut-off date for this

Chart 4.15 Share of market risk allocated to Tier 1 capital by euro area large and complex banking groups

(2003 – 2007; percentage of Tier 1 capital)



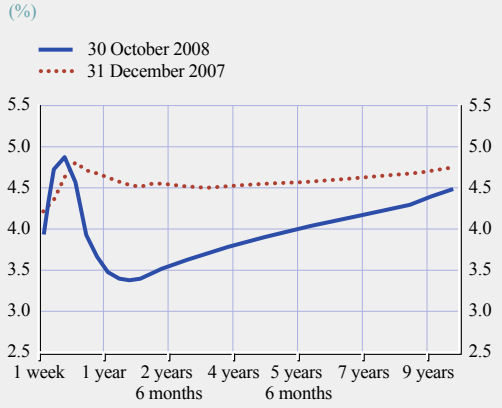
Sources: Individual institutions' financial reports and ECB calculations.
Note: FX denotes the foreign exchange. In the chart, one-year 99% VaR measures were used for credit risk and ten-day VaR measures were used for the market risk.

15 It should be noted that these estimates can be sensitive to the specific confidence level chosen. Moreover, they do not account for any hedging of the credit risk exposures. The reported figures should thus be seen as representing an upper bound to the credit VaR these institutions could be exposed to.

16 Since the direct exposures of euro area LCBGs to exchange rate risk are rather small and stable over time, and likely to be extensively hedged, this section focuses on the analysis of LCBGs equity market risks.

17 Indeed, banks' exposures to credit risk have increased via investment exposures to ABSs and collateralised debt obligations (CDOs) in their trading books or in off-balance-sheet vehicles for which liquidity support is provided. The defaults, or technical defaults (as in the case of the GSEs in the United States), of some large financial firms in the third quarter of the year affected the credit quality of a considerable number of ABS and CDO structures worldwide.

Chart 4.16 Euro area yield curve developments and scenario



Sources: Reuters and ECB calculations.

Chart 4.17 Dow Jones EUROSTOXX 50 equity market volatility

Sources: Bloomberg and ECB calculations.

FSR, the short end of the euro area yield curve (beyond the very short-term maturity), where banks tend to borrow more than they lend and invest, remained elevated relative to long maturities, although rates have decreased since the publication of the June 2008 FSR owing to the reductions in policy interest rates in October and in November 2008. At medium and longer-term maturities, where banks tend to lend and invest, yields declined further, meaning that revenues from floating rate loans and debt instruments also fell.

In order to gain some insights into the changes in interest rate risk facing LCBGs throughout 2008, implied portfolios can be derived from the reported VaR figures on the assumption of a constant portfolio composition.[18] The VaRs on these portfolios can then be re-estimated using the most volatile yield curve that materialised up until mid-November 2008.[19] Since the end of 2007, the shape of the euro area yield curve has fluctuated significantly. Chart 4.16 plots the yield curve that demonstrates the highest volatility of the daily yield curves between early January and late November 2008 and which can be used as a basis for calculating the peaks in interest rate VaRs the LCBGs may have experienced in 2008 unless they reduced their exposures. In particular, the reconstructed yield curve would be approximately 1.9 times more volatile than the end-2007 yield curve.

Like the fixed income VaR, the equity VaR of LCBGs' trading books can be expressed as a product of the size of the portfolio and its volatility, which can be approximated by the volatility of the Dow Jones EURO STOXX 50 equity index (see Chart 4.17). To analyse the sensitivity of the LCBGs' equity VaR figures to observed changes in volatility, the VaRs were recalculated using the average of volatility within October-November 2008 that amounted to 55% as compared with the level of around 20% at end-2007.

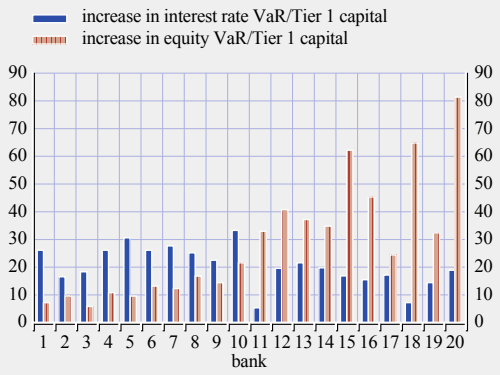
Applied to the LCBGs' fixed income portfolios, the increase in VaRs seems to be more pronounced for those LCBGs that have the

18 The VaR figures reported by the LCBGs reflect the results of a simulation exercise in which current portfolios are run through a set of historical price changes. This yields a distribution of changes in the value of the portfolio, of which a percentile (the VaR) can be calculated. In other words, the VaR figures can be expressed simply as the size of the exposure times the historical volatility of the portfolio. The sizes of the portfolios can then be derived from the reported VaR figures.

19 The assumption of a constant portfolio composition may be restrictive, especially in the current environment of asset sales and de-leveraging by many euro area LCBGs. However, the exercise provides useful insights into the stresses these institutions may have faced on account of the market turmoil that subsequently compelled many of them to shed financial assets.

Chart 4.18 Changes in interest rate and equity VaRs for euro area large and complex banking groups

(percentage of Tier 1 capital)



Sources: Individual institutions' financial reports and ECB calculations.

largest exposures in terms of interest-bearing debt or long-maturity fixed rate loans to customers. All in all, the increases in the interest rate VaRs could in some cases have been substantial when using the exposures at the end of 2007 as inputs (see Chart 4.18). Reflecting the increase in VaR measures, many LCBGs have reduced their fixed income exposures in the course of 2008 in order to control the risks in their trading books.

Regarding equity VaRs, the assumed increase in volatility would imply a jump in the equity VaR figures across the individual LCBGs, which can be large in some cases (see Chart 4.18). On average, however, the increase seems to remain relatively contained. On a positive note, comparing the results with the increases in interest rate VaRs shows that the exposures to these two categories of risk show a relatively low correlation for individual institutions. Nevertheless, for those institutions that reported the highest VaR levels at the end of 2007, i.e. for those with the highest market risk profiles, the estimated increases in VaRs may have caused problems in terms of solvency ratios unless exposures were appropriately reduced in the course of 2008.

Moreover, it should be taken into account that for some LCBGs with more sizeable investment banking operations, the fee income derived from market activities may also be significant. Therefore, in periods of prolonged market stress, the contribution of non-interest income generated from trading and sales activities is likely to decline substantially.

FUNDING LIQUIDITY RISKS

The financial turbulence that erupted in August 2007 has had a protracted adverse impact on euro area LCBGs' funding positions. Indeed, financing from practically all sources has become more expensive, although the differences in funding structures across individual LCBGs implies that these institutions have been affected to varying degrees. [20]

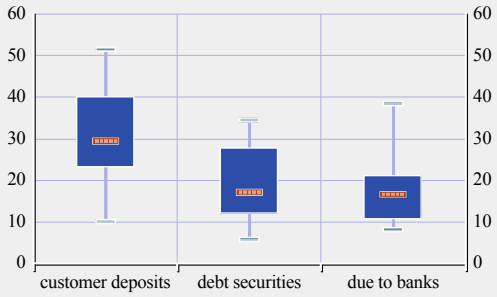
As discussed in detail in Section 3.1, funding liquidity risks intensified particularly markedly in late September when liquidity in the unsecured interbank markets evaporated in all but the very short-term maturity segments of the market and when the availability of funds and costs of borrowing deteriorated in other segments of the euro area money market (e.g. secured borrowing and commercial paper). By the end of November, tensions in the money markets had eased somewhat, but funding pressures remained high.

As already highlighted in previous issues of the FSR, many euro area LCBGs have become more vulnerable to adverse changes in the cost of, and access to, market-based funding on account of their increasing reliance on wholesale funding sources. The aggregate liability structure of LCBGs shows that, while customer deposits represent the most important source of funding for LCBGs (with a median share of 29.4%), the share of non-deposit funding is also significant for a number of LCBGs (see Chart 4.19). Indeed, the share of debt securities in LCBGs'

20 More recent information suggests that the rate of expansion of LCBGs' liabilities has decreased in 2008. As this moderation coincided with a period in which some of these institutions had to accommodate warehoused loans and re-intermediated assets from off-balance-sheet vehicles, as well as provide liquidity support to such vehicles, this decline is indicative of banks continuing to find it difficult to secure funding.

Chart 4.19 The share of customer deposits and wholesale funding in euro area large and complex banking groups' total liabilities

(H1 2008 percentage; maximum, minimum, interquartile distribution and median)



Sources: Individual banks' financial disclosures and ECB calculations.
Note: Other liabilities not shown in the chart include, among others, trading liabilities, subordinated debt and insurance companies' technical reserves.

total liabilities varies from 5.8% to 34.5%. The dependence on interbank markets also shows considerable variation across LCBGs, with the share of liabilities to banks ranging between 8.2% and 38.4%. For those LCBGs that have a high proportion of wholesale financing, the risks with respect to a smooth recourse to funding are likely to remain acute in the period ahead. In particular, those LCBGs that are more reliant on interbank funding may become more dependent on overnight borrowing and could thus face increased rollover risks in the unsecured interbank markets.

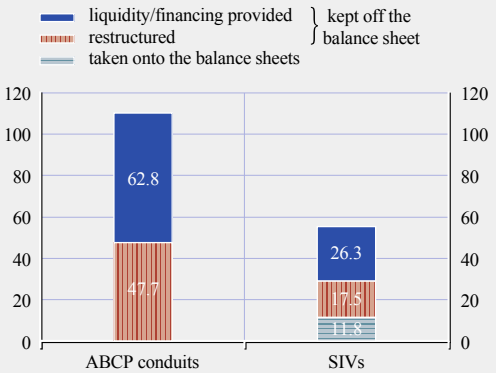
Another source of risk relates to the fact that some euro area LCBGs have issued large amounts of short-term floating-rate fixed income securities over past years, which need to be rolled over at regular intervals. Although the LCBGs in question should have no problems in rolling over such debt in normal circumstances, any adverse news of either idiosyncratic or systematic nature in the current environment of high investor risk aversion could significantly increase the costs of doing so, or could even make it impossible.

In addition to the increased rollover risks related to balance sheet funding, the credit lines that had to be extended to support liquidity-constrained off-balance-sheet vehicles continue to put pressure on LCBGs' liquidity management. Chart 4.20 shows that one year after the eruption of the market turmoil, the liquidity support extended by LCBGs still amounted to almost €90 billion. On the other hand, the chart also shows that only a relatively small share of the assets in the off-balance-sheet vehicles have actually been re-intermediated into banks' balance sheets.

With regard to bond and equity financing, the negative developments in LCBGs' share prices and bond yields since the publication of the June 2008 FSR – which will also be discussed in Section 4.3 below – imply that the costs have increased significantly since then, in particular in late September. This has contributed to the fact that issuance of both debt and equity capital may have become prohibitively costly for some institutions. Reflecting such concerns, the banks responding to the ECB's bank lending surveys of July and October 2008 have indicated that costs related to their capital positions contributed to the net tightening of credit standards, although there are currently no signs that capital constraints have become binding in the sense that they would be affecting the ability, rather than the willingness, of the banks to lend. Looking forward, given the high market volatility, the access to funds of, in particular, those institutions that might need to tap the

Chart 4.20 Euro area large and complex banking groups' exposures to SIVs and conduits

(EUR billions)



Sources: Individual institutions financial reports and ECB calculations.

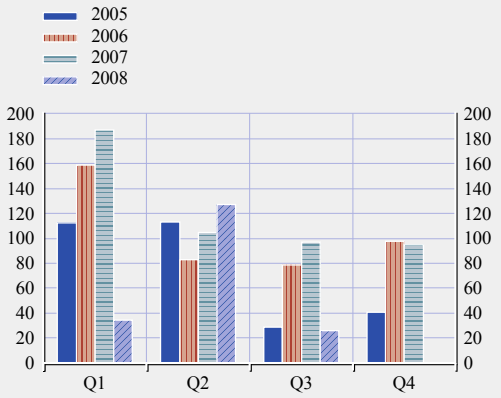
equity markets to replenish their capital bases may remain very difficult in the period ahead.

Over the years prior to the onset of the ongoing market correction, securitisation had become an increasingly important source of financing for many euro area LCBGs (see Chart 3.11), although the volumes of securitisation issuance in euro area countries remained clearly below those in the United Kingdom, for example. As discussed in detail in Section 3.2, liquidity in the market for publicly placed securitisation has all but disappeared with the financing problems faced by banks' off-balance-sheet structures, which were typically large buyers of the highest-rated securitisation tranches. The drying-up of liquidity in the secondary market for loans has caused some LCBGs to have to rely increasingly on the market for private placements – including securitisations retained for use as collateral in central bank liquidity operations – for their securitised loans. Looking forward, the probability of a recovery in the market for publicly placed securities may be considered rather low over the near term at least in the case of the current structure of the market.

In contrast to the very low level of publicly placed ABS issuance, the issuance of long-term senior unsecured debt and covered bonds picked up in the second quarter of 2008, after very weak issuance activity in the first three months of the year (see Chart 4.21). However, the issuance of long-term debt securities stalled after mid-September as financial market tensions intensified, and thus net issuance dropped significantly in the third quarter of the year. As a consequence, in the first nine months of 2008 the volume of net issuance of long-term debt securities by euro area MFIs, at around €190 billion, was 52% lower than in the corresponding period of the previous year. Looking forward, euro area banks' new debt issuance will probably be supported by the government debt guarantees introduced in many euro area countries from October.

Chart 4.21 Net issuance of long-term debt securities by euro area MFIs

(Q1 2005 – Q3 2008; EUR billions)



Source: ECB.

Reflecting tightened financing conditions in the wholesale funding markets, new debt issuance took place at higher spreads, thereby contributing further to the increase in banks' funding costs. Reflecting the intensification of the financial turmoil in late September, the yields on, in particular, senior unsecured bank debt – as based on the respective benchmark iBoxx index – surged to unprecedented heights, reaching 7.4% in mid-October 2008.[21] By late November, bank bond yields had returned to lower levels (6.2%), but swap spreads remained wide.

Against the background of the reduced availability and elevated costs of financing in the wholesale markets, competition for retail deposits has intensified among the banks across all size categories – inducing many LCBGs – to bid up the interest rates offered on new deposits which may in turn have contributed further to increased funding costs.

Overall, liquidity conditions have deteriorated across a broad range of wholesale funding markets for banks, in particular from late September. Against this background, many

21 Figures provided by Markit.

euro area LCBGs may find it more difficult to secure interbank financing other than at very short-term maturities or to roll over their short- term debt securities. In addition, the costs of financing increased significantly for almost all sources of funding, including secured and unsecured markets. Elevated funding costs could put pressure on banks' interest margins or could be passed on to non-financial borrowers thereby contributing to increased default risk.

COUNTERPARTY RISKS

Counterparty risk is the risk that one of the parties to a contract will not fulfil its contractual obligations by failing either to pay or to deliver securities due to bankruptcy and/or settlement or other operational failures. In practice, however, the term "counterparty risk" is typically used to refer to the credit risk associated with bilateral non-retail transactions in various over-the-counter (OTC) markets, as opposed to lending operations to non-financial clients or trades conducted in organised exchanges that ensure clearing and delivery-versus-payment settlement.

Since the finalisation of the June 2008 FSR, the counterparty risks faced by euro area LCBGs have increased substantially in an environment of persistently high volatility and illiquidity in the credit markets and the difficulties experienced by many financial institutions, including in particular the failures and near-failures of some large US counterparties.

Despite sizeable public sector interventions, concerns about counterparty credit risk, funding pressures and uncertainty regarding their own liquidity position, frequent credit rating downgrades by rating agencies and the higher credit risk of major bank counterparties implied in CDSs have all prompted liquidity hoarding and cuts in unsecured interbank lending limits. This has hampered the effective redistribution of liquidity among banks. Even in the repo markets, banks have been transacting predominantly at shorter maturities, against higher-grade collateral and with more conservative haircuts at the outset of a transaction.

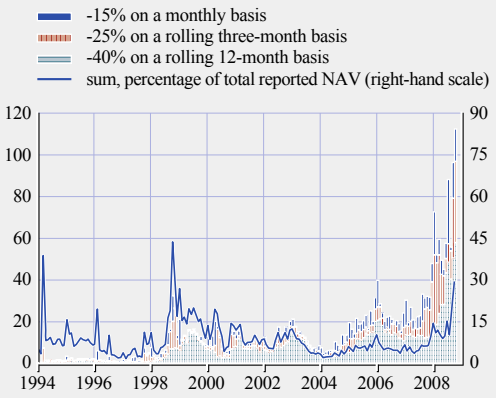
Leveraged non-bank counterparties, the most important of which are hedge funds, have not escaped the tighter credit terms applied by banks either. However, the curtailed availability of leverage may not always have implied lower counterparty credit risk for banks since net flows from investors and the investment performance of many hedge funds continued to suffer amid turbulent conditions in the global financial markets and are likely to lead to a higher liquidation rate in the period ahead (see also Section 1.3). As shown in Chart 4.22, the estimated total net asset value (NAV) and the proportion of single-manager hedge funds breaching typical triggers of total cumulative NAV decline[22] have increased markedly since the finalisation of the June 2008 FSR.

After the problems encountered by several large US prime brokers, hedge funds and other

22 Triggers of total NAV cumulative decline represent contractual termination events which allow banks to terminate transactions with a hedge fund and seize the collateral held.

Chart 4.22 Estimated total net asset value (NAV) and proportion of hedge funds breaching triggers of cumulative total NAV decline

(Jan. 1994 – Oct. 2008; USD billions and percentage of total reported NAV)



Sources: Lipper TASS database and ECB calculations.
Note: Excluding funds of hedge funds. The net asset value (NAV) is the total value of a fund's investments less liabilities; 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.

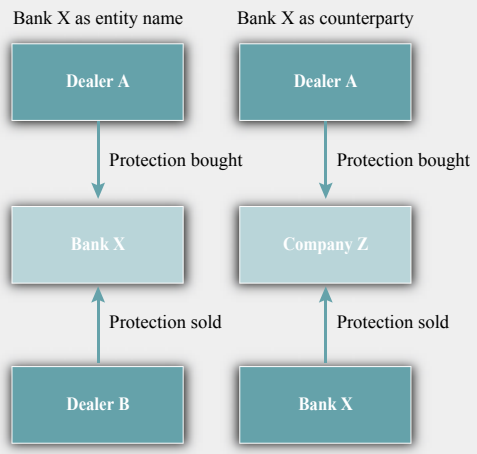
institutional investors, particularly the larger ones, are reportedly paying increasing attention to the safety of the funds and securities kept with prime brokers, and are thus asking for the segregation of those assets. This reduces the ability of banks to recycle hedge funds' assets for their own purposes. Moreover, in the wake of recent events, more hedge funds are likely to establish additional dealing relationships, possibly favouring banks with stronger balance sheets. More generally, this highlights another dimension of counterparty risk, which is related to the willingness of counterparties to transact and can prove crucial for the destiny of a strained financial institution. As highlighted by recent events, even good collateral may not be sufficient to obtain funding if the counterparty is concerned that it will need to liquidate posted collateral in potentially far less liquid markets.

In September 2008, based on the definitions applied in CDS contracts, several large US financial institutions experienced credit events that were expected to present a major test for contract settlement in this rapidly growing OTC market. By the time of the cut-off date of this issue of the FSR, some of the post-event cash settlement auctions, and the resulting payouts, had already taken place. These relatively smooth developments were partially due to a number of initiatives by both public and private sector entities on various infrastructure-related issues, such as efforts to reduce trade confirmation backlogs, to standardise and automate CDS trades and to agree to utilise cash settlement auctions in connection with future credit events. Nonetheless, the turmoil underscored the necessity to create a central clearing counterparty for the credit derivatives market – a need that was also acknowledged and supported by market participants themselves. [23]

The aforementioned credit events and the looming turn of the credit cycle have also brought to the fore another layer of complexity and counterparty risk that is posed by CDS contracts. In contrast to other OTC derivatives, the buyer of credit protection in a CDS transaction should be concerned not only about the default of a counterparty, but also about the potential simultaneous default of a reference entity (see Chart 4.23). An example of such double default might be a CDS trade executed with Lehman Brothers with the aim of protecting the firm against a default of Fannie Mae or Freddie Mac. In such cases, it is possible that only a limited credit protection pay-out, if any, would materialise.

Banks, including euro area LCBGs, tend to be important players in the CDS market, both as intermediaries and as buyers of credit protection in the pursuit of lower risk weights on their credit exposures. In the latter case, an impairment of the CDS market, or the risk of incomplete pay-outs in cases of defaults, could cause the risk weights of banks' assets to increase and trigger additional needs for capital in an environment where conditions for raising capital remain difficult or unfavourable.

Chart 4.23 Alternative ways banks can be exposed to the CDS market



Source: ECB.

23 See Counterparty Risk Management Policy Group, "Containing Systemic Risk: The Road to Reform", August 2008.

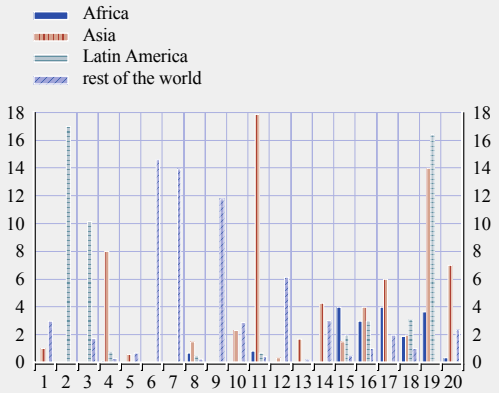
Emerging market exposures and risks

Macroeconomic conditions in emerging market economies (EMEs) have become significantly more challenging since the publication of the June 2008 FSR, reflecting lower growth prospects, tighter external financing conditions, exposure to the global deleveraging process and rising domestic inflation (see Box 3 and Section 1.1). Consequently, the risks to euro area LCBGs that originate from their emerging market exposures have increased markedly.

Based on LCBGs' annual reports, their loan exposures to EMEs in 2007 have increased somewhat across all regions in comparison with 2006, but remained relatively small, on average. The proportion of loans extended to borrowers by euro area LCBGs averaged 1% in Africa, 3.5% in Asia, 2.5% in Latin America and 4% in the rest of the world (with the remaining 89% being extended to counterparties in Europe and North America). As regards more recent developments, the growth of exposures to EMEs continued further into 2008, as shown by BIS data on euro area banks' foreign claims vis-à-vis main EME regions (see Table S6 and Charts S100 and S101).

Chart 4.24 Euro area large and complex banking groups' emerging market lending exposures

(percentage of total loans)



Source: Individual institutions financial reports.
Note: The rest of the world does not include Europe and North America.

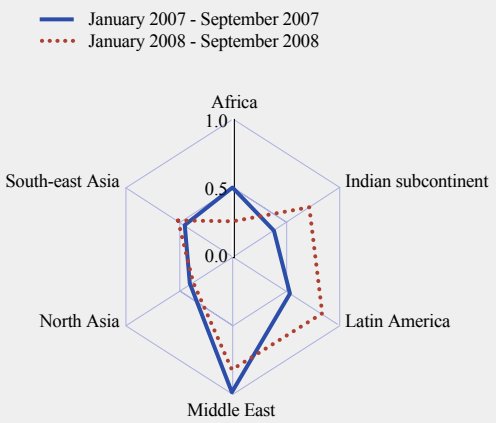
It is important to note that the average figures on exposures mask important differences in exposures across LCBGs (see Chart 4.24). In particular, some LCBGs had major exposures to Latin America (between 10% and 15% of their loan portfolios) in 2007, while others had significant exposures to Asia (amounting to up to 20% of their loan portfolios). Moreover, the EME exposures of those LCBGs that had non-negligible EME exposures in 2006 increased by, on average, around 10% in 2007.[24] This suggests that in the event of serious macroeconomic stress in EMEs, only some euro area LCBGs could face a more significant increase in loan losses, so that the materialisation of EME risks alone is unlikely to have systemic consequences. If the losses on EME exposures were to be coupled with persistent turbulence in the financial markets or a surge in domestic loan losses, however, they could add to more systemic stress in euro area LCBGs.

Based on aggregate information from the private financial industry, the share of LCBGs' non-interest income that is derived from EME countries was rather small, albeit increasing somewhat. From early January to 15 September 2008, euro area LCBGs generated around 3.5% of their non-interest income from underwriting, managing and running the books for EME-related banking activities. Although there are some differences in this respect across individual LCBGs, none of the euro area LCBGs generates more than 5% of its non-interest income from EMEs. Of the geographical regions, Latin America and the Indian sub-continent increased their importance as sources of non-interest income, while the Middle East remains a prominent area for euro area LCBGs in terms of revenues generated by trading, fees and commissions (see Chart 4.25).

24 An exposure is assumed to be non-negligible if the share of the loan book in a particular EME region is less than 5% of the total loan book.

Chart 4.25 Euro area large and complex banking groups' non-interest income from emerging market activities

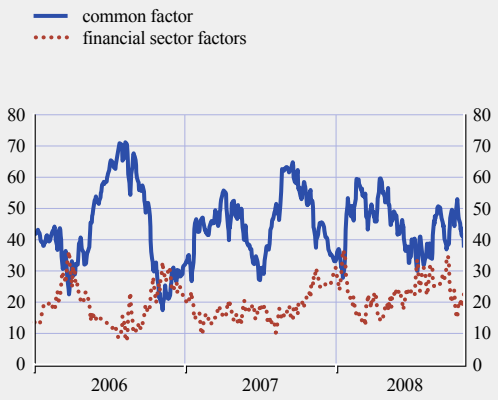
(percentage of total non-interest income)



Sources: Dealogic, Bloomberg, Thomson Financial Datastream and ECB calculations.

Chart 4.26 Decomposition of the variance of euro area banks' equity returns by common and financial-sector factors

(Jan. 2006 – Nov. 2008, percentage of equity returns variance)



Sources: Bloomberg and ECB calculations.

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

Since the finalisation of the June 2008 FSR, market-based indicators have continued to point to increasing risks to LCBGs.[25] This has mainly been attributed to the uncertainty surrounding the further evolution of the financial sector turmoil. In particular, there were fears about banks' capacity to withstand counterparty defaults and the possibility that sub-prime losses could spread to other segments of the credit markets. Although most euro area governments recently introduced support measures for banks, fears about the impact of a possible global economic slowdown on banks' credit books intensified in October. Market participants, therefore, reassessed their expectations of euro area banks' profit-generating capacities. This drove LCBGs' equity prices significantly lower, to levels last seen in 2001 (see Chart S110). At the same time, implied volatility rose to historically high levels (see Chart S111).

Further insights into the reasons behind the recent movements in the equity prices of euro area banks can be gained from a decomposition of the volatility of bank stock prices. According to the perceptions of market participants, risks specific to the financial sector and, in particular, to the banking sector have risen since March 2008; together with the component representing systematic risks common to all equities, this explained as much as 75% of the variance of banks' share prices in October 2008 (see Chart 4.26). This supports the view that bank equity returns were driven both by fears regarding the ability of the banking sector to withstand challenging market conditions and by a greater risk of an adverse feed-back loop related to a downturn in the credit cycle. This, in turn, may pose additional challenges to the banking system, at a time when its' shock-absorption capacity has already diminished on account of weakened balance sheets.

Such concerns have also become apparent in the CDS spreads of euro area LCBGs, which have trended upwards since May 2008. These spreads reached new highs in the aftermath of the default by Lehman Brothers (see Chart S108). A decomposition of CDS spreads revealed that since the turbulence erupted, CDS premia for euro area LCBGs have been driven mainly by

25 A word of caution in interpreting the market based indicators is necessary since in the current volatile market conditions they may depict a more pessimistic picture than the fundamentals would suggest.

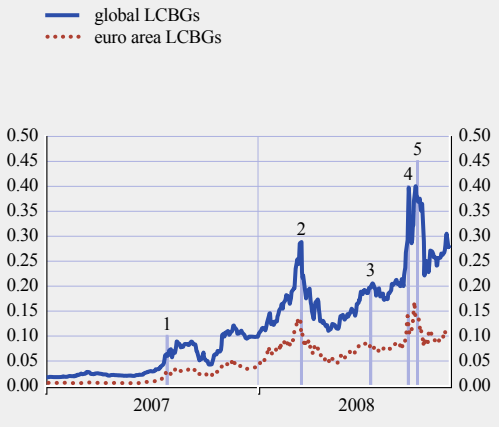
investors' demand for higher compensation for bearing the risks of both a systemic default and lower financial market liquidity (see Box 11). The CDS spreads of individual LCBGs moved within a relatively narrow range in the first six months of the turmoil; since May 2008, however, investors have started to discriminate across individual institutions. This may have been due to market participants' assessments of the ability of individual banks to withstand further shocks, given the past impact of turmoil-related losses.

Against this background, systemic risk in the euro area banking sector has increased, as indicated by the surge in a market-based systemic risk indicator. This was driven by a further widening of CDS spreads, which reached record highs in the aftermath of the default of Lehman Brothers, and the broad co-movement of LCBGs' equity returns (see Chart 4.27). Following a series of defaults or near defaults of several global financial institutions, the indicator decreased substantially, as guarantee schemes were approved and some euro area LCBGs were recapitalised. Nevertheless, it remained above the levels seen in the summer of 2008, suggesting that market participants continued to assign a relatively high probability to systemic defaults by LCBGs. This pattern was also reflected in other market-based measures of risk, related to the euro area and global banking systems (see Box 12).

The distance-to-default, an equity-based yardstick of credit risk, decreased substantially over the last six months, on account of falling stock prices, and highlighted a further increase in default probabilities for individual LCBGs (see Chart S107). This development was also reflected in the surge of expected default frequencies (EDFs) (see Chart S106). The increase in the median EDFs masks a widening of the interquartile dispersion of EDFs among individual euro area LCBGs since the beginning of 2008 (see Chart 4.28), which indicated that the credit risk associated with some banks was deemed to have increased more than others. All in all, both indicators of market participants' sentiment suggest that, although

Chart 4.27 Systemic risk indicator for large and complex banking groups

(Jan. 2007 – Nov. 2008)

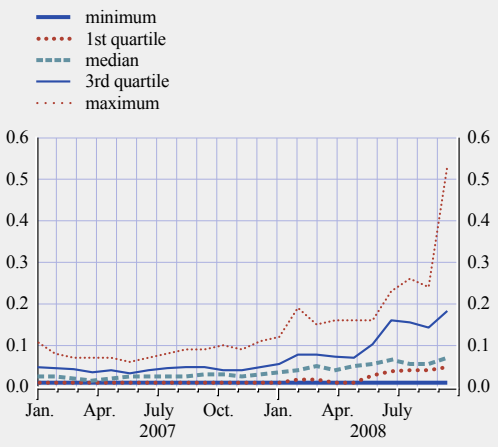


1. Turmoil begins
2. Bear Stearns rescue take-over
3. Rescue plan of US Fannie Mae and Freddie Mac announced
4. Lehman Brothers defaults
5. US Senate approves Paulson plan

Sources: Bloomberg and ECB calculations.
Note: Implied probability of two or more LCBGs defaulting simultaneously within the next two years.

Chart 4.28 Dispersion of euro area large and complex banking groups' expected default frequencies

(Jan. 2007 – Sep. 2008; percentage probability)



Sources: Moody's KMV and ECB calculations.
Note: The EDF provides an estimate of the probabilty of default over the following year. Due to measurement considerations, the EDF values are restricted by Moody's KMV to the interval between 0.01% and 35%.

Chart 4.29 Option-implied risk-neutral density bands for the Dow Jones EURO STOXX bank index

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

Sources: Bloomberg and ECB calculations.

the profit-generating capabilities, and thus the shock-absorption capacities, of LCBGs were eroded further, they still remain at their long-term historical levels.

By the end of November, the short-term outlook for euro area LCBGs was still negative. According to option-implied risk-neutral density indicators, however, market participants had also priced in a small probability of recovery in euro area bank stock prices (see Chart 4.29). In particular, the confidence bands derived from options quotes narrowed slightly at the end of November 2008, although they were still strongly skewed towards the negative side. Nevertheless, the highest confidence intervals were skewed upwards. Overall, this suggested that market participants assigned a higher probability to large downward movements in euro area bank stock prices, while not ruling out the probability of a strong rebound.

All in all, the outlook for the euro area banking sector has deteriorated further, according to forward-looking market indicators and despite the tentative signs of stabilisation indicated by the short-term options-based indicator. This further deterioration was related to declines in securities prices, challenging funding conditions, possible feed-back effects from the deterioration in general economic conditions and the increased systemic risk faced by the euro area banks. This notwithstanding, and in spite of the sizeable decline in the equity prices of LCBGs over the last six months, market-based credit risk indicators suggested by the end of November 2008 that the shock-absorption capacity, although diminished, was close to long-term average levels. Nevertheless, the outlook for euro area LCBGs remains uncertain and challenging market conditions may put further pressure on these institutions in the period ahead.

Box 11

PRICE OF DEFAULT RISK AS A MEASURE OF AVERSION TO CREDIT RISK

Since the financial turmoil erupted, the CDS spreads of LCBGs have widened significantly, suggesting that banks' default risk has increased. This may be explained by investors' increased aversion regarding credit risk, which followed the repricing in this risk category in the aftermath of the sub-prime problems. This box decomposes the CDS spreads of LCBGs into an expected-loss component and a default risk premium. The latter reflects the compensation required by investors for accepting exposure to default risk, and can also be used as an indicator of aversion to credit risk. [1]

1 The decomposition of CDS spreads is based on intensity-based pricing models. In particular, this box draws on the method presented in J.D. Amato, "Risk aversion and risk premia in the CDS market", *BIS Quarterly Review*, Bank for International Settlements, December 2005.

According to intensity-based CDS pricing models, the CDS premium (*CDS*) can be decomposed into an expected-loss component (*EL*) and a default risk premium (*DR*). The latter is composed of a jump-to-default risk premium (*JtD*), which is the compensation for the sudden default of the entity before the market has had time to factor in its increased default risk into current spreads, and a systematic risk premium (*S*), which is the compensation for the volatility of the risk factors affecting default probability:

$$CDS = EL + DR = EL\,JtD + S\,, \tag{1}$$

Thus, the default risk premium can be measured as the difference between the CDS spread and the expected-loss component. The decomposition can also be written in multiplicative form:

$$CDS = EL * RA\,, \tag{2}$$

where the risk adjustment ratio *(RA)* is the compensation for a unit of expected loss and is usually reflected as the price of default risk (*PDR*):

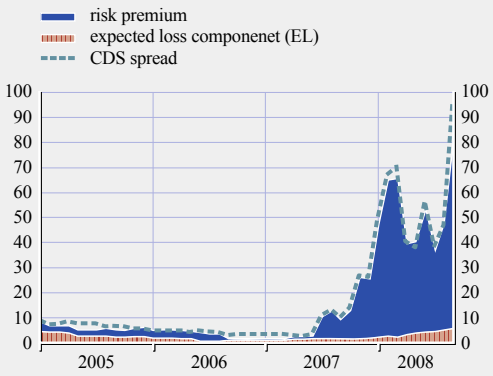
$$RA = 1 + PDR \tag{3}$$

Using equation (2), both the price of default risk and the risk adjustment ratio may be approximated by the quotient of *CDS* to *EL*. This ratio is a measure of investors' aversion to default risk.

Using this method, the one-year CDS spreads of individual euro area LCBGs were decomposed into expected-loss and default risk premium components. Moody's one-year expected default frequencies of individual LCBGs were used as a proxy for EL, assuming a loss-given-default of 0.55. Furthermore, the variance of the risk premium was decomposed using a Cholesky-variance decomposition within a VAR framework to explain the rise in the default risk premium since August 2007.

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

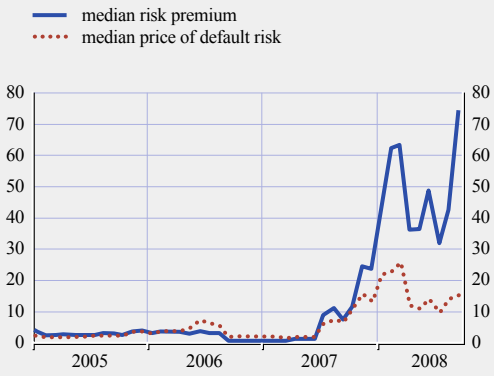
(basis points)



Sources: Bloomberg, Moody's and ECB calculations.
Note: Since expected-loss components and risk premiums were calculated for each LCBG individually, sum of their averages does not equal the average CDS spread.

Chart B Default risk premium and price of default risk for euro area large and complex banking groups

(basis points)



Sources: Bloomberg, Moody's and ECB calculations.

The significant widening of euro area LCBGs' CDS spreads observed since August 2007 was driven mainly by the default risk premium (see Chart A). Whereas the largest proportion of CDS spreads corresponded to the compensation for expected loss between 2005 and mid-2007, since the eruption of the turmoil, the expected-loss component has increased only moderately in comparison with the default risk premium. This is because the former is a more fundamentals-based and is, therefore, a less volatile measure of default risk.

A simple VAR model-based decomposition of the variance of the risk premium revealed that as much as 40% of the variance may be explained by systemic risk (as measured by the systemic risk indicator – see Chart 4.27), and another 20% by liquidity (as measured by the market liquidity risk indicator – see Chart 3.1 in Section 3.1). This suggests that investors' high aversion regarding LCBGs' credit risk was driven mainly by fears related to jump-to-default risk – due to the possibility of a systemic spillover – and, to a lesser extent, by vanishing liquidity in the broader financial markets.

Since April 2008, aversion to credit risk, as measured by the price of default risk, has declined. Although it still remained at a relatively high level in September 2008, it has not reached the levels seen after the near default of Bear Stearns (see Chart B). This was due to the increase in the expected-loss component, which has been rising steadily since the end of 2007, suggesting that CDS spreads are increasingly being driven by rising probabilities of default of individual LCBGs. This could reflect a perception by market participants that the shock-absorption capacities of individual LCBGs may have diminished. However, it should be kept in mind that, more recently, CDS prices themselves may have incorporated additional risk premium components, which could complicate their interpretation in times of intense financial market stress.

PERSISTENT NEGATIVE RATING OUTLOOK CONTINUES

The overall high ratings reported for euro area LCBGs in the June 2008 FSR were broadly sustained in the second half of 2008, with average ratings in the AA- category. Weighted on an assets-under-management basis, around 75% of all banking assets in the group of euro area LCBGs continued to be under the control of banks with a rating of AA- or better. However, the rating outlooks – considered a medium-term indicator of the potential direction of longer-term credit ratings (beyond one to two years) – remained depressed at levels similar to those reported in the first half of 2008 (see Table S7). Across the sample, 17 negative outlooks were assigned by the three rating agencies, against just two positive outlooks, in the period under consideration. Overall, the balance of positive-to-negative rating actions, which includes changes in rating levels, in addition to changes in rating outlooks, remained clearly negative in the period after the June 2008 FSR (see Chart S114). However, the persistently higher number of negative rating outlooks, which by definition indicates a higher probability of a downgrade, points towards a significant number of rating downgrades in 2009, with some rating downgrades having already occurred for a small number of LCBGs by the finalisation of this FSR issue. Rating agencies reported that likely triggers include (i) a reduced ability to rebuild financial profiles in a context where softer economic conditions restrain revenues and increase loan-impairment problems, and (ii) capital strategies that are not commensurate with heightened levels of risks. This suggests that several LCBGs may have to deleverage their balance sheets further in order to avoid the risk of rating downgrades (see also Box 9 and Section 4.2).

Looking ahead, rating agencies expect that the downturn in the real economy will put considerable downward pressure on banks' ratings. The likelihood of higher loan

losses, driven by the economic downturn, in combination with the losses already realised from the market turmoil, may contribute to weaker financial profiles. To the extent that the economic conditions deteriorate further, rating agencies will shift their focus to emerging problems in traditional loan books. Although these loan books have generally continued to perform well, rating agencies have reported early signs of rising delinquencies, tighter underwriting standards and slower loan growth.

With respect to banks with exposures to structured credit securities, rating agencies expected that the bulk of write-downs would have been made by mid-2008. However, institutions with exposures to monoline and mortgage insurers, or troubled US counterparties, may face a further round of write-downs arising from higher counterparty risk.

Overall, rating agencies indicate that sharper-than-expected changes in the economic outlook, challenging funding conditions and a weakened outlook for possible recapitalisations could give rise to downgrades for some euro area LCBGs, despite the fact that a somewhat weaker economic outlook has already been factored into current ratings.

Box 12

MEASURING THE TIME-VARYING RISK TO BANKING SECTOR STABILITY

To further expand the market-based framework for monitoring systemic risk in the Financial Stability Review, this box introduces a new method for estimating joint probabilities of default (PoDs) for euro area and global LCBGs.[1]

The first step in constructing the indicator is to collect data on alternative market-based PoDs for the individual banks to be included in the sample, such as Merton-type PoDs or PoDs inferred from credit default swaps (CDS-PoDs). Visual analysis of historical time series reveals that the latter appear to be more responsive to news affecting the banking sector. In the topical context, the CDS-PoDs have also captured the recent financial market stresses better. In addition, being a market-based measure, the CDS-PoDs may provide real-time information on changes in those individual banks' default probabilities for which CDSs exist, although words of caution should be added since PoDs based on CDS spreads may be biased upwards in periods of market stress. To move from individual bank PoDs to the joint probability of default (JPoD), this box follows a framework which conceptualises the banking system as a "portfolio of banks". Using a novel non-parametric copula approach and CDS-PoDs as inputs, the banking system's JPoD can be derived. The JPoD embeds both linear and non-linear dependence and allows for these to change throughout the economic cycle, reflecting the fact that dependencies typically increase in periods of distress. These are relevant technical improvements over most risk models, which usually account only for linear dependence (correlation), which is also assumed to remain constant over the cycle. From the JPoD estimate, it is possible to further derive a measure for banking system stability, a banking system stability index (BSI). The BSI represents the expected number of bank defaults in the portfolio of banks, given that at least one bank defaults. The advantage

1 For a similar methodology previously used for an assessment of systemic risk assessment in this context, see Box 16 in ECB, *Financial Stability Review*, December 2007. The methodology applied in this box draws heavily on M. Segoviano and C. Goodhart, "Banking Stability Measures", *IMF Working Paper*, forthcoming, M. Segoviano, "The Conditional Probability of Default Methodology", Discussion Paper No 558, Financial Markets Group, London School of Economics, 2006, and M. Segoviano, "The Consistent Information Multivariate Density Optimizing Methodology", Discussion Paper No 557, Financial Markets Group, London School of Economics, 2006.

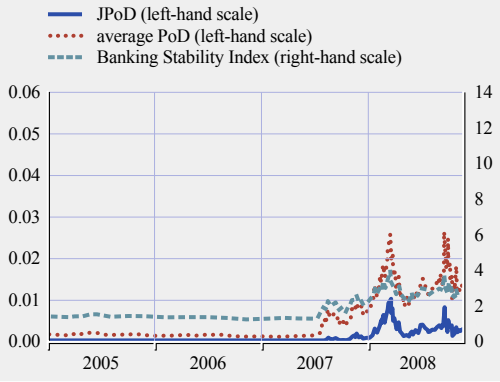
of this derived indicator is that it transfers the movements in the JPoD to an ordinal measure that is comparable across different sub-samples since a larger sample generally decreases the probability of default.

The comparison of changes in an unweighted average of CDS-PoDs with changes in the JPoD (the level of which is much lower due to the measurement of the probability of a multiple default, instead of the averaged probability of single-entity defaults) reveals the importance of incorporating default inter-dependence into the analysis. Charts A and B illustrate, for instance, that the change in the JPoD between 1 June 2007 and 15 November 2007 (this is the time horizon of the first JPoD pick-up) was stronger (it increased by a factor of 14160.7 for euro area LCBGs, and by one of 5554.3 for global LCBGs) than the change in the average CDS-PoD (which increased by a factor of 3.7 for euro area LCBGs, and by one of 3.3 for global LCBGs in the same period). This divergence can be explained by an increase in banks' default interdependence, which is taken into account in the JPoD. Notably, between the beginning of May and mid-September 2008 (the episode of the Lehman Brothers default), the average CDS-PoD increased by a factor of 8.0 for the global LCBGs and by a factor of 4.0 for the euro area LCBGs. In contrast to this result, the JPoD for the global LCBGs picked up by a factor of 2.4 within the same time horizon, while it increased by a factor of 1.4 for the euro area LCBGs. This discrepancy in developments across groups of banks suggests that the CDS market saw relatively larger increases in systemic risk for global LCBGs at the time.

Finally, Charts A and B also show that, for euro area and global LCBGs up to the summer of 2007, the BSI has been moving in the range of two banks out of the sample defaulting, given that at least one bank out of the sample defaults. From mid-2007 onwards, the BSI went up to four banks defaulting, given one bank defaults, for both euro area and global LCBGs. This is in line with the movement of the JPoD. However, the BSI shows a less strong momentum in periods of distress (e.g. mid-September 2008). Consequently, it seems that while the JPoD is a suitable tool for short-term monitoring of systemic risk, the BSI conveys information about more medium-term developments.

Chart A Average CDS-PoD, joint probability of default (JPoD) and Banking Stability Index (BSI) for euro area large and complex banking groups

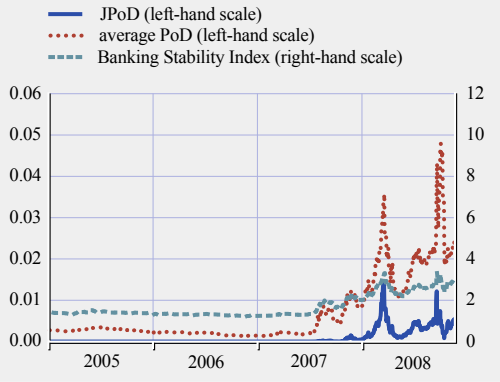
(percentage probability; number of banks for the BSI)



Sources: Bloomberg and ECB calculations.
Note: The sample of euro area LCBGs includes 14 banks. The scale of the euro area JPoD series has been adjusted to allow for visual comparison with the average CDS-PoD series. Therefore, a comparison in terms of changes, instead of levels, has to be made.

Chart B Average CDS-PoD, joint probability of default (JPoD) and Banking Stability Index (BSI) for global large and complex banking groups

(percentage probability; number of banks for the BSI)



Sources: Bloomberg and ECB calculations.
Note: The sample of global LCBGs includes 12 banks. The scale of the global JPoD series has been adjusted to allow for visual comparison with the average CDS-PoD series. Therefore, a comparison in terms of changes, instead of levels, has to be made.

4.4 OVERALL ASSESSMENT

Since the publication of the June 2008 FSR, the financial turmoil has implied substantial additional income losses for euro area LCBGs. However, past profit buffers and recent action taken by institutions to control leverage contributed to the fact that solvency ratios have remained relatively buoyant in most cases.

The intensification of the stresses in the interbank money markets in October 2008 generated acute liquidity problems for some of those euro area LCBGs whose asset quality was considered more uncertain by the financial markets. Eventually, however, information asymmetries contributed to a situation where institutions with more solid asset quality were also affected. Although the coordinated interventions by governments and central banks helped to stabilise the liquidity concerns, tensions have remained in the credit and money markets. For the most part, these tensions seem to reflect the perception of growing risks in LCBGs' loan exposures on account of the deteriorating global macroeconomic environment.

While the central bank measures and the guarantees provided by governments are likely to support the stabilisation of the money markets in the medium term, and should thus mitigate the currently elevated funding liquidity risk concerns, the worsening of the economic outlook is likely to intensify LCBGs' earnings and credit risks from various sources. In particular, pressure on revenues could be rising because of a deceleration of the growth of lending to both households and firms against the background of weaker economic activity. In addition, given much shallower financial market liquidity and a virtual standstill in securitisation activities, fees and commissions from asset management activities, as well as trading income, are likely to remain very subdued for some time to come. However, it should be stressed that there are important variations across the LCBGs as some of them are likely to be less exposed to the worsening of asset quality than others.

Given this environment, and notwithstanding government measures, the uncertainty surrounding the outlook for the banking sector remains high. Against this backdrop, it is crucial that banks consider the opportunities to raise new capital and curb their dividend pay-outs so as to mitigate the pressure to reduce lending to the private sector in the necessary process to restore their balance sheets.

The most significant risks currently faced by the euro area LCBGs can be summarised as follows:

- ⬆ earnings risks due to the slowdown in macroeconomic activity
- ⬆ credit risks from lending to the non-financial sectors
- ⬆ counterparty credit risks from hedge funds and CDS markets
- ⬆ emerging market risks due to the slowdown in the global economic growth
- ➡ risks of further mark-to-market losses from trading booksecurities holdings
- ➡ funding liquidity risks from the interbank money market and other market-based funding sources
- ⬇ the risk of a retail deposit run

⬆ *increased risk since the June 2008 FSR*
➡ *unchanged since the June 2008 FSR*
⬇ *decreased risk since the June 2008 FSR*

5 THE EURO AREA INSURANCE SECTOR

The outlook for the euro area insurance sector deteriorated after the finalisation of the June 2008 Financial Stability Review (FSR) as the sectors' financial performance weakened and some pre-existing risks and challenges facing the sector increased and started to materialise. In particular, the financial market turbulence and spillovers to the real economy have created and could pose further challenges for many insurers. In addition, insurers that offer banking services, or those firms that are part of financial conglomerates, continue to be affected by challenges confronting the banking sector. That said, information available for the third quarter of 2008 on the solvency positions of euro area insurers suggests that they have a reasonable amount of remaining shock absorption capacity to weather the materialisation of the risks they currently face.

5.1 FINANCIAL CONDITION OF LARGE INSURERS AND REINSURERS

FINANCIAL PERFORMANCE OF LARGE INSURERS [1]

The financial performance of large euro area insurers deteriorated in the first three quarters of 2008. Most insurers witnessed a reduction of premiums written in the first half of 2008, as compared with the same period in 2007, and subdued growth continued in the third quarter of the year (see Chart 5.1).

Turmoil in the equity and credit markets reduced demand for life insurance products, in particular unit-linked products, and contributed to a lowering of premiums written. In addition, non-life premium growth was hampered by continued strong competition and lower demand in some segments, which put pressure on premium rates.

Insurers' financial performances were, however, supported by the fact that insurance losses thus far in 2008 remained stable in comparison with previous years, among other things because of manageable losses from catastrophic events. At the same time, expenses increased somewhat, but combined ratios still remained below 100% for all of the insurers considered (see Chart S119).[2]

Lower premium and investment income contributed to a broad-based reduction in the profitability of insurers in the first three quarters of 2008. The median return on equity was 12.0% in the first half of the year, and it decreased to 10.1% in the third quarter for those insurers that had reported at the time of finalisation of this FSR (see Chart 5.2). Investment income was reduced by negative trends in the capital markets – including falling values of structured credit products, corporate bonds and equities. In addition, some insurers suffered losses on investments in commercial property.

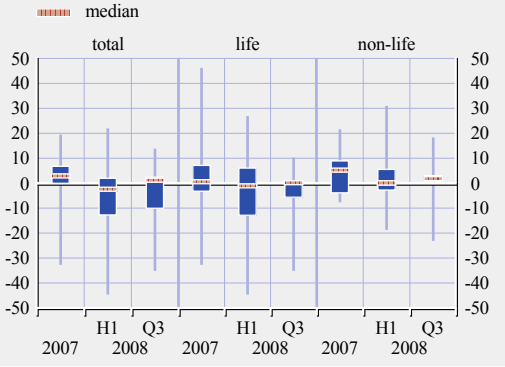
As mentioned in past issues of the FSR, euro area insurers' exposures to structured credit products were significant in some cases, and most insurers

1 The analysis of the financial performance and condition of large euro area insurers is based on the consolidated accounts (also including reinsurance activity, where applicable) of a sample of 19 listed insurers (composite, life and non-life insurers, and financial conglomerates with large insurance activities), with total combined assets of about €5 trillion. This represents around 60% of the gross premiums written in the total euro area insurance sector. However, at the time of writing, not all figures were available for all companies.

2 The combined ratio is calculated as the sum of the loss ratio (net claims to premiums earned) and the expense ratio (expenses to premiums earned). Typically, a combined ratio of more than 100% indicates an underwriting loss for the insurer.

Chart 5.1 Distribution of gross-premium-written growth for a sample of large euro area primary insurers

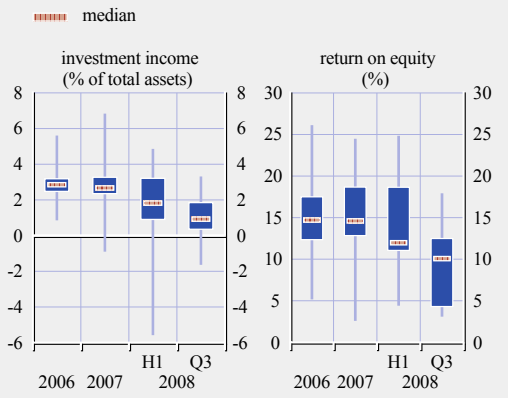
(2007 – Q3 2008; percentage change per annum; nominal values; maximum, minimum and interquartile distribution)



Sources: Bloomberg and ECB calculations.

Chart 5.2 Distribution of investment income and return on equity for a sample of large euro area primary insurers

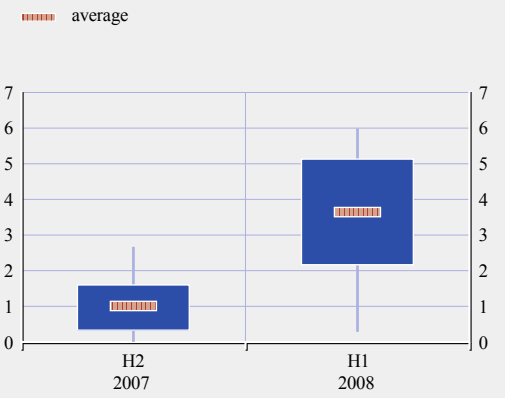
(2006 – Q3 2008; maximum, minimum and interquartile distribution)



Sources: Bloomberg and ECB calculations.

Chart 5.3 Profit and loss write-downs of selected euro area primary insurers and reinsurers

(percentage of shareholders' equity; maximum, minimum and interquartile distribution)



Sources: JPMorgan Chase & Co., institutions' financial disclosures and ECB calculations.

reported write-downs on such investments in the first half of 2008 (see Chart 5.3). Insurers with large banking activities generally had larger exposures, and thus suffered larger losses. Exposures to products referencing US sub-prime mortgages, however, were generally low, which saved most insurers from write-downs of the magnitude recorded by, for example, many euro area banks (see Section 4.1).

As reported in the June 2008 FSR, however, it should be noted that possible investment losses may not as yet have been recognised in insurers' profit and loss accounts. This is because, in general, insurers' securities holdings are classified mainly as "available for sale" and are thus recorded at fair value on their balance sheets, with any losses that are recorded leading to movements in shareholders' equity.[3] However, no loss is recorded in the profit and loss account unless it is considered an impairment that is other than temporary.[4] Many IFRS-reporting insurers have, however, imposed a policy on themselves that triggers impairments when the value of their equity investment falls 20% below the acquisition costs, or remains below the acquisition cost for longer than a certain predefined period (of, typically, six to 12 months). For credit investment, a charge against earnings is taken when there is a delay in the payment of interest or principal. As a result thereof, equity investment losses also started to be recorded for "available-for-sale" assets in the figures for the first half of 2008 (see Chart 5.3), but losses on credit exposures have thus far been more limited.

Insurers also hold investments on behalf of policyholders that have bought unit-linked insurance products, for instance. Some declines in asset values have therefore led to reductions in insurers' deferred policyholder liabilities, but this has not affected the insurers' results.[5]

FINANCIAL PERFORMANCE OF MAJOR REINSURERS[6]

On average, euro area reinsurers reported declines in gross premiums written in the first

3 On average, the value of shareholders' equity in some of the largest euro area insurers declined by some 17% in the first half of 2008.

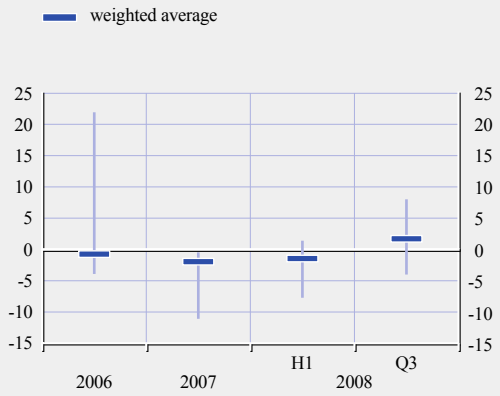
4 This differs from the practices of banks which generally record most securities "at fair value through profit and loss", which means that the assets are marked-to-market through the profit and loss account.

5 See, for example, Moody's Investors Service, "European Insurers' H1 2008 Results: No Overall Credit Impact, But Moody's Continues to Monitor", August 2008.

6 The analysis of the financial performance and condition of major euro area reinsurers is based on the consolidated accounts (also including primary insurance activity, where applicable) of a sample of four reinsurers, with total combined assets of about €280 billion, representing about 30% of total global reinsurance premiums. However, not all figures were available for all companies.

Chart 5.4 Distribution of gross-premium-written growth for a sample of large euro area reinsurers

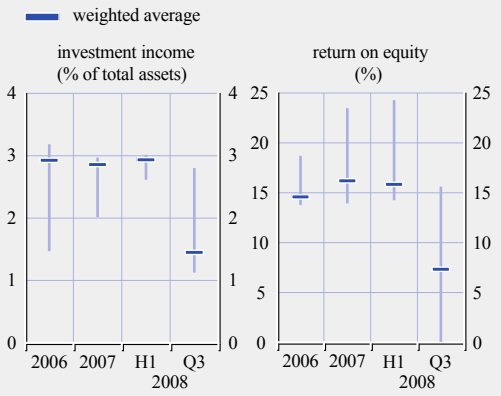
(2006 – Q3 2008; percentage change per annum; maximum-minimum distribution)



Sources: Bloomberg and ECB calculations.

Chart 5.5 Distribution of investment income and return on equity for a sample of large euro area reinsurers

(2006 – Q3 2008; maximum-minimum distribution)



Sources: Bloomberg and ECB calculations.

half of 2008 and limited growth in the third quarter of 2008 compared to the same periods of the previous year (see Chart 5.4).[7] Relatively contained disaster-related losses during 2007 contributed to reducing demand for reinsurance. However, some reinsurers benefited from insurers' limited access to equity and debt markets, which led to increased demand for traditional reinsurance products from insurers seeking to strengthen their capital positions.

Reinsurance prices declined by about 9%, on average, during the January 2008 reinsurance renewal season, and prices continued to fall – although at a slower pace – across most product lines during the July 2008 renewals. The main driver of falling prices was the rather low disaster-related losses in 2007 and early 2008. The financial condition of reinsurers was also negatively affected by higher losses, especially in the third quarter of 2008 – in particular due to a relatively severe Atlantic hurricane season, which led to combined ratios rising above 100% for some reinsurers (see Chart S122).

Euro area reinsurers recorded stable investment income in the first half of 2008 compared with recent years, but significant declines in the third quarter of 2008 (see Chart 5.5). At the same time, the average return on equity declined somewhat to 15.8% in the first half of 2008 and dropped significantly to 7.3% in the third quarter, from 16.2% in 2007 (see Chart 5.5).

SOLVENCY POSITIONS OF LARGE INSURERS AND REINSURERS

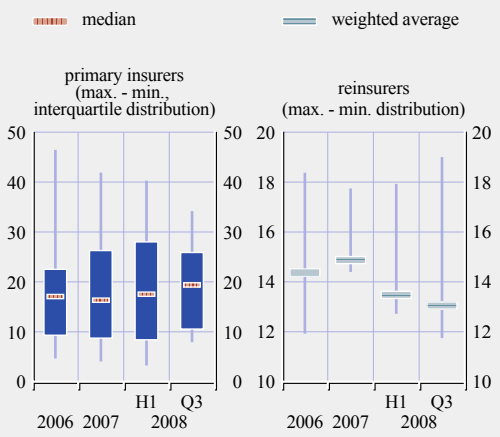
The deteriorating financial performance of primary insurers and reinsurers in the first half of 2008 generally had an only moderate impact on insurers' solvency positions during this period (see Chart 5.6). Thanks to the modest investment losses recorded by euro area insurers and given the fact that insurers do not, in general, have to issue debt to fund their businesses, they did not have to raise new capital to the same extent as some euro area banks over the past six months. However, some insurers increased their capital buffers by issuing debt and equity, and some received capital injections from governments to bolster their solvency.

Some insurers (in particular, some reinsurers) did, however, report reduced capital buffers for the first three quarters of 2008. A number of solvency positions were negatively affected by

7 The gross-premium-written figures are on a pro forma basis. On a published basis, Scor's acquisition of Converium resulted in an increase of around 30% in premiums written in the first three quarters of 2008.

Chart 5.6 Distribution of capital positions for a sample of large euro area primary insurers and reinsurers

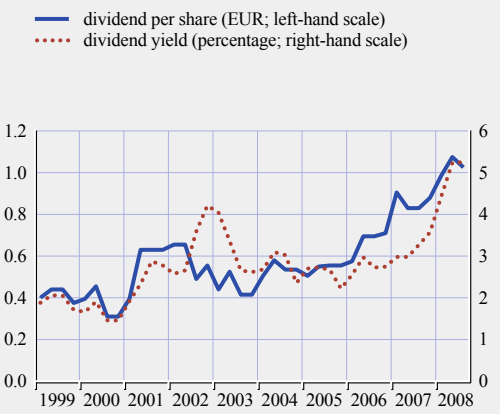
(2006 – Q3 2008; percentage of total assets)



Sources: Bloomberg and ECB calculations.

Chart 5.7 Dividend per share and dividend yield for a sample of large euro area primary insurers and reinsurers

(Q1 1999 – Q3 2008)



Sources: Thomson Financial Datastream and ECB calculations.
Note: The dividend per share is the anticipated rolling 12-month dividend per share and excludes special or one-off dividends. The dividend yield expresses the dividend per share as a percentage of the share price.

lower issuance of hybrid capital, subordinated debt and insurance-linked securities.

It should be noted, however, that insurers' often keep capital levels in excess of regulatory requirements with the objective of obtaining a certain targeted credit rating from rating agencies. In some cases, the weakening of the solvency positions of some insurers can thus be seen as an erosion of excess capital as the solvency positions in the third quarter of 2008 appeared to include a reasonable amount of shock absorption capacity. It is difficult, however, to measure capital adequacy consistently across insurance companies in view of different national and company practices and levels of disclosures. The Solvency II capital requirements that are scheduled to come into effect in 2012/2013 will improve this.

The increased use of insurance securitisation in recent years has helped insurers and reinsurers to distribute risk exposures and, thereby, to improve their solvency positions. Issuance slowed down in the first half of 2008, however. The slowdown was most pronounced in life insurance securitisations as these transactions often involved a "monoline" financial guarantor as the seller of protection. The troubles confronting financial guarantors caused them to withdraw from this business. Issuance of non-life insurance-linked securities, by contrast, held up relatively well. For example, worldwide issuance of catastrophe bonds – the largest insurance securitisation segment – totalled USD 2.9 billion in the first half of 2008, compared with USD 7.2 billion in 2007 as a whole.

Insurers themselves in general seem to view their capital positions as adequate since previously announced return programmes for shareholders, via share buybacks and dividends, have largely been maintained over the past six months. Together with the falling stock prices of insurers over the past year, this led to increasing dividend yields which reached historical highs (see Chart 5.7).

5.2 RISKS FACING THE INSURANCE SECTOR

Most of the risks insurers face can be classified into three broad categories: (i) technical risks, such as those arising from incorrect assessment of potential losses and risks (e.g. catastrophic

events or life expectancies) leading to under-pricing and risk concentrations; (ii) investment risks, such as potential losses from falling values of equity investments, low long-term bond yields and credit risks (non-payment by counterparties); and (iii) contagion and reputation risks for insurers that also provide banking and other services, or are part of financial conglomerates or own banks or other financial institutions.

The most significant risks that euro area insurers currently face include, in no particular order:

- financial market risks;
- risks associated with a deteriorating macro-financial environment;
- longevity risks;
- the risk of losses from catastrophic events exceeding projected losses;
- contagion risks from banking activities or from ownership links to banks and other financial institutions; and
- strong competition in some segments, together with an increased focus on creating shareholder value.

These risks are discussed hereafter. It should be noted that these risks are not necessarily the most likely future scenarios that could negatively affect insurers, but are instead potential and plausible events that could, should they occur, materially impair the solvency of insurers.

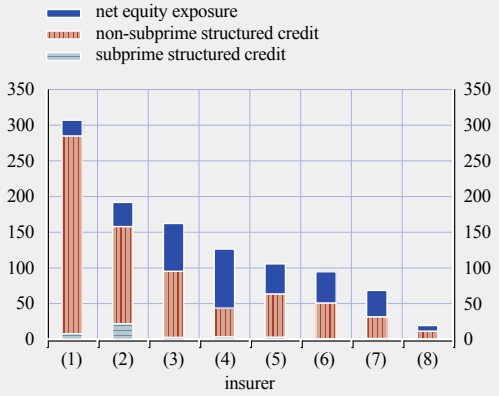
FINANCIAL MARKET RISKS

As highlighted in past issues of the FSR, financial market risks are one of the most prominent types of risk that insurers face – mainly via their investment activities. Owing to the increased turbulence in the financial markets after the finalisation of the June 2008 FSR, the related risks for insurers have increased and have started to materialise as many insurers have reported reduced investment income or investment losses. Some insurers have also revised their earnings forecasts downwards, mainly on account of lower expected investment income. However, insurers generally do not employ much leverage in their investments and they generally have, unlike banks, longer-term liabilities that help them in avoiding liquidity problems. Nevertheless, insurance companies face the risk that investment values can fall to levels below regulatory requirements or to levels which cause credit rating agencies to downgrade them.

Information that became available after the June 2008 FSR supports the assessment that euro area insurers' exposures to structured credit products that reference US sub-prime mortgages are in general low (see Chart 5.8). As mentioned in the June FSR, the low exposures, as compared with, for example, some euro area banks, could possibly be explained by the fact that insurers often try to match the risk-return profiles of their liabilities and assets by, for example, aligning the currency and domicile of assets and liabilities. This could explain the rather low appetite for US structured finance products. A further explanation is that insurers improved their risk management significantly after the large losses suffered in 2001 and 2002, and have since then become more prudent in their management of risk.

Chart 5.8 Credit and equity exposures of selected euro area primary insurers and reinsurers

(H1 2008; percentage of shareholders' equity)



Sources: JPMorgan Chase &Co., institutions' financial disclosures and ECB calculations.
Note: Data also include exposures of some insurers' banking activities.

In some cases, however, exposures to non-sub-prime structured credit products are large, and thus a source of vulnerability if the credit market problems were to spread further to prime or near-prime asset-backed security (ABS) valuations (see Chart 5.8). Insurers' ability to hold investments until maturity (to back liabilities) means that the key risks facing insurers from their credit exposures are not temporary losses in market values but defaults. Nevertheless, sharp downgrades of the ratings of structured credit products could force insurers to reduce their holdings or recognise impairments, which would affect their results and capital positions.

As mentioned above, large listed insurers' securities holdings are generally classified as "available for sale" and are therefore recorded at fair value on the balance sheets. However, a loss is not recorded in the profit and loss account unless it is considered an other-than-temporary impairment. Some insurers do, however, impose on themselves a policy that triggers impairments when the value of an investment asset falls 20% below its acquisition cost, or remains below the acquisition cost for longer than a certain predefined period (sometimes six months). The protracted downturn in the equity and credit markets in 2008 could therefore affect insurers' profit and loss accounts more significantly in forthcoming quarters than has been the case so far if the currently challenging capital market conditions should persist or, indeed, worsen. However, many insurers reduced their equity investments in 2007 (see Chart S124), and they further reduced these investments and hedged some exposures during 2008, which should help to alleviate some of the equity investment risks.

Insurers hold investments on behalf of policyholders that have, for example, bought unit-linked insurance products. Some losses on insurers' investments have therefore been borne by policyholders. However, in order to limit the impact of potential negative reputation effects, some insurers might decide to directly compensate the losses incurred by policyholders, also in cases where explicit guarantees were not provided.

As highlighted in the June 2008 FSR, a further financial market risk is the risk of government bond yields falling to and remaining at very low levels which life insurers, in particular, are facing in view of the still large stock of guaranteed-return contracts in many euro area countries. Government bond yields continued to fall after the finalisation of the June 2008 FSR (see Section 3.2), which made it more difficult for life insurers to cover minimum guarantees to policyholders.[8] Rising corporate bond yields after the finalisation of the June 2008 FSR, however, have made it possible for insurers to invest in higher-yielding assets.

RISKS ASSOCIATED WITH A DETERIORATING MACRO-FINANCIAL ENVIRONMENT

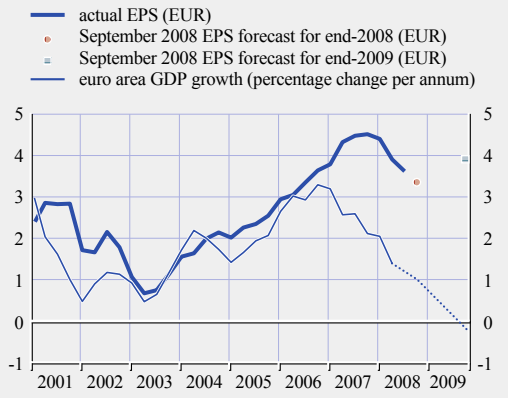
A further risk for which the likelihood of materialisation has continued to increase after the finalisation of the June 2008 FSR is the risk associated with the deteriorating macro-financial environment (see Sections 1 and 2). There are four main ways in which this could affect insurers negatively. First, insurance underwriting is usually supported by a favourable economic environment that drives the demand of both households and firms for insurance. A deteriorating economic environment therefore has the potential to reduce earnings for insurers (see Box 13). Given that economic growth has tended to lead insurers' earnings in the past, the – in the view of market participants – still rather optimistic earnings outlook for insurers both for the remainder of 2008 and for 2009 may have to be revised downwards in the period ahead (see Chart 5.9).

Second, insurers could be affected if conditions in the corporate sector were to deteriorate, resulting in losses on insurers' investments in corporate bonds and structured credit products, as well as in losses from CDS exposures related

8 It should be noted, however, that falling bond yields also have a positive impact on insurers' financial results since they lead to unrealised gains on bond portfolios and an increase in shareholders' equity.

Chart 5.9 Earnings per share (EPS) and the forecast 12 month ahead for a sample of large euro area primary insurers and reinsurers, and real GDP growth in the euro area

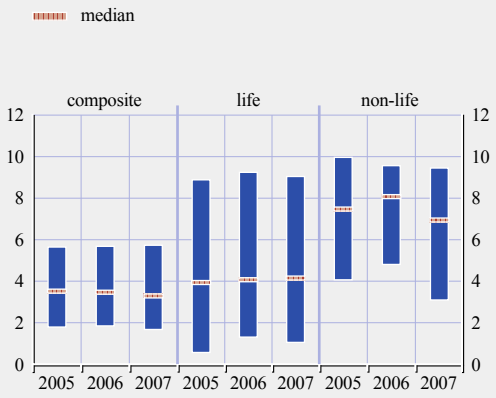
(Q1 2001 – Q4 2009)



Sources: ECB, Consensus Economics, Thomson Financial Datastream and ECB calculations.

Chart 5.10 Distribution of direct investments in commercial property of euro area insurers

(2005 – 2007; percentage of total investments; interquartile distribution)



Source: Standard and Poor's (Eurothesys database).

mainly to protection sold on collateralised debt obligations (CDOs).

Third, some (mainly life) insurers also extend loans to households and firms, so that they would be exposed to greater credit risks if credit market conditions in these sectors were to deteriorate.

Fourth, insurers often have significant investment exposures to commercial property markets (see Chart 5.10). These investments often take the form of direct investment, but there is also investment in property funds and commercial mortgage-backed securities (CMBSs). Conditions in some commercial property markets have been deteriorating, and potentially worse economic conditions are likely to weaken at least some commercial property markets further (see Section 2.3). This could, in turn, negatively affect insurers' investment in commercial property.

Box 13

THE INSURANCE UNDERWRITING CYCLE IN THE EURO AREA

The amount of insurance premiums written and insurance premium rates typically move in cycles that have in the past lasted between six and ten years. Insurance underwriting cycles can be divided into "hard market" periods, in which insurance rates are at levels that correspond to a return on capital that equals or exceeds the cost of capital, and "soft market" periods, in which underwriting returns are low or even negative (see Figure A).[1] This box examines how the insurance underwriting cycle can shape the financial performance of insurers, and thus financial stability.

During a hard market period, the insurance sector accumulates capital via new inflows and retained profits. However, this capital expansion usually leads to higher competition in the sector, which ultimately results in reduced premium rates and diminishes opportunities for profits and

1 See, for example, Fitch Ratings, "The Property/Casualty Underwriting Cycle", April 2008.

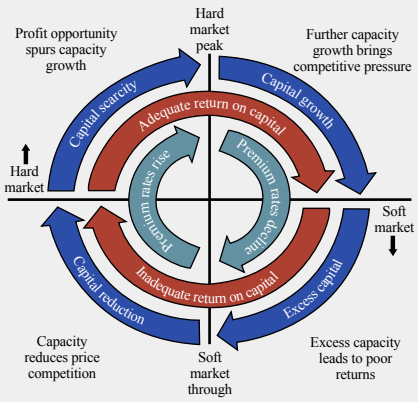
brings the market into a soft market period. During a soft market period, underwriting capacity declines on account of lower returns and competition among insurers is reduced, which leads to increases in premium rates and, eventually, to a return of adequate underwriting profitability for insurers.

The insurance underwriting cycle is important from a financial stability perspective as insurers are more prone to face underwriting losses during a soft market. In addition, when underwriting performance is poor, insurers have to rely more on investment income to achieve positive financial results, which might make them lean towards increased risk-taking in their investments.

The assessment is that the euro area insurance underwriting cycle is currently in a soft market period – mainly due to the competitive environment in some segments – and can be seen to be in the bottom right quadrant of Figure A, and possibly close to the trough of the cycle. It should be noted, however, that different insurance segments (such as life or non-life) and regional markets sometimes have their own distinctive underwriting cycles.

The insurance underwriting cycle is closely linked with the business cycle (see Chart A). This is because the economic environment affects the demand of both households and firms for insurance products. A deteriorating economic environment has the potential to reduce earnings for insurers. Other factors, such as disaster-related losses or unexpected changes in claim trends can, however, also affect the insurance underwriting cycle. Furthermore, periods in which the investment income of insurers is high can weigh on the underwriting cycle as insurers may engage in cash-flow underwriting, whereby premiums are written not with the aim of increasing technical profits, but to increase investment income when investing the new funds. This seems to have been the case in recent years when the growth of premiums written did not follow the relatively strong GDP growth in the euro area and insurers had to rely to a greater extent on investment income (see Chart A).

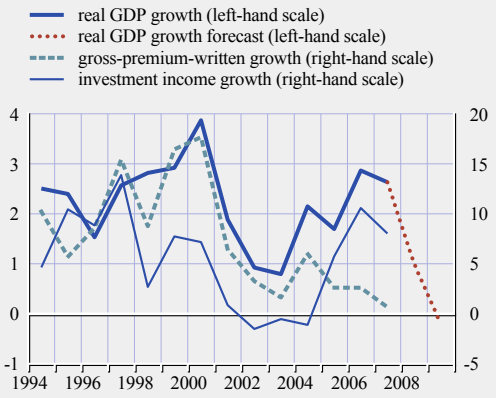
Figure A The insurance underwriting cycle



Source: Fitch Ratings.

Chart A Gross premiums written and investment income for a sample of large euro area primary insurers and reinsurers, and euro area GDP growth

(percentage change per annum)



Sources: ECB, Consensus Economics, Thomson Financial Datastream and ECB calculations.

Looking ahead, the prospects for a deteriorating economic environment in the euro area – where GDP growth is expected to slow down in 2008 and 2009 (see Chart A) – are likely to have a negative effect on many insurers' underwriting performances. This is contributing to a less favourable and more uncertain outlook for the euro area insurance sector at present.

LONGEVITY RISKS

Looking further ahead, life insurers and reinsurers continue to face the risks posed by increasing life expectancy, so-called longevity risk. This can lead to reserve deficiencies in insurers annuity books and may lead to insurers taking greater risks in their investment activities. The reduced demand for insurance-linked securities seen in the first half of 2008 may have forced some insurers who had originally planned to reduce longevity risk via these markets to maintain their exposures.

THE RISK OF LOSSES FROM A CATASTROPHIC EVENT EXCEEDING PROJECTED LOSSES

For non-life insurers and reinsurers, one of the most prominent risks remains the potential for losses from catastrophic events turning out to be larger than projected losses, either as a result of forces of nature or on account of terrorism. In Europe, the gale "Emma" in early 2008, and some hail and rainstorms during the year, caused significant insured losses which led to higher expenses for some insurers. Turning to the Atlantic hurricane season, thus far the 2008 hurricane season is second in terms of destructiveness only to that of 2005, with up to USD 54 billion in damage and expected insured losses of around USD 20 billion. Some of the insured losses are still to be borne by insurers. Atlantic hurricane and storm forecasts made before the season started had, however, predicted above-average activity which could have led to insurers setting aside higher reserves for claims and therefore avoiding unexpected losses (see Table 5.1).

Table 5.1 Number of Atlantic hurricanes and storms recorded in, and forecast for, the 2008 season

	Historical average	2007	2008 by end-Nov.	2008 forecasts	
				Colorado State University	NOAA
Atlantic					
Named storms	11	14	16	17	14-18
Hurricanes	6	5	8	9	7-10
Major hurricanes	3	2	5	5	3-6

Sources: Colorado State University and National Oceanic and Atmospheric Administration (NOAA).
Note: Forecasts made in August 2008.

CONTAGION RISKS FROM BANKING ACTIVITIES OR FROM OWNERSHIP LINKS TO BANKS AND OTHER FINANCIAL INSTITUTIONS

Many large insurers operate in a number of different business segments. This can often be viewed positively from a financial stability perspective as it can reduce vulnerabilities in individual business lines. However, insurers engaged in, for example, banking activities, or insurers that are part of financial conglomerates, can face particular risks in the currently challenging environment for banks. For example, ownership links to banks and other financial institutions and contagion risks from banking activities have affected some insurers negatively. This could continue to be a source of risk for some insurers through four main channels. First, as seen in the case of some large insurers in 2007, losses incurred by a banking entity could be material and could thus also affect the group as a whole, including an insurance entity. Second, a deterioration of conditions in a banking entity that leads to rating downgrades could affect the rating and, thereby, the financing costs of an insurance entity. Third, an insurance entity might be called upon to provide intra-group transfers of liquidity to an ailing banking entity. Fourth, there could be a reputation risk from, for example, losses or liquidity problems reported by a banking entity spreading to an insurance entity or the group as a whole.

STRONG COMPETITION IN SOME SEGMENTS, TOGETHER WITH AN INCREASED FOCUS ON CREATING SHAREHOLDER VALUE

Further potential risks that could lead to vulnerabilities for some insurers arise from the continued competitive environment in the euro area insurance sector – in particular, in non-life insurance – and competition between banks and life insurers that sometimes offer similar saving products. This, together with a continued focus on creating shareholder value – as shown by the commitment to maintain dividends and announced share buyback programmes – could lead to increased risk-taking by insurers in their investment activities and underwriting.

Some reduced competition and new business opportunities can, however, be expected for some euro area insurers since the troubled US insurer AIG is expected to play a reduced role in some insurance segments in the future (see Section 1.3).

5.3 OUTLOOK FOR THE INSURANCE SECTOR ON THE BASIS OF MARKET INDICATORS

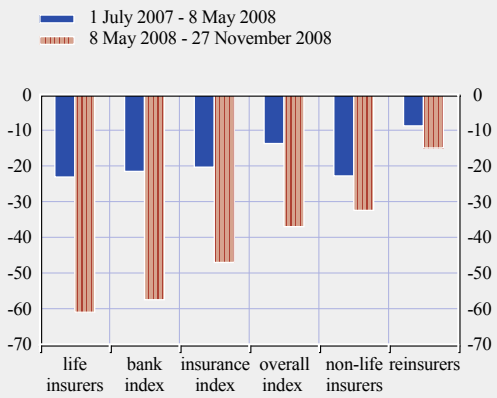
At the time of the finalisation of the June 2008 FSR, the share prices of euro area insurance companies had fallen by more than the overall stock market since the onset of the financial market turbulence in the summer of 2007 and had followed closely those of euro area banks (see Chart 5.11). Since then, insurers' share prices have again fallen more than the overall index but less than those of euro area banks.

Stock price performances across different insurance segments were disparate, however, as the share prices of life insurers declined more sharply than those of non-life insurers and reinsurers (see Charts 5.11 and S128). This could be explained by the fact that life insurers are generally more exposed to financial market risks.

The weakness of euro area stock prices brought about further declines in the price/earnings ratios of euro area insurers (see Chart S131). This suggests that market participants assess the earnings prospects of the sector less positively than before. At the same time, euro area insurers' expected default frequencies (EDFs) continued to rise in the past six months (see Chart S126). Higher uncertainty surrounding the outlook for euro area insurers was also implied in large insurers' credit default swap spreads which rose above those of euro area banks during November, although they remained below the iTraxx main index (see Chart 5.12).

Chart 5.11 Share price developments for euro area banks, insurers and the overall euro area stock market

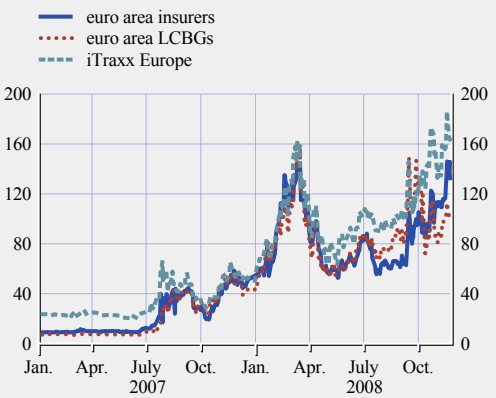
(percentage change)



Sources: Bloomberg, Thomson Financial Datastream and ECB calculations.

Chart 5.12 Credit default swap spreads for a sample of euro area insurers and euro area large and complex banking groups, and the iTraxx Europe main index

(Jan. 2007 – Nov. 2008; basis points; five-year maturity; senior debt)



Sources: Bloomberg and JPMorgan Chase & Co.

All in all, patterns in market indicators after the publication of the June 2008 FSR continue to imply a less favourable and riskier outlook for the euro area insurance sector.

5.4 OVERALL ASSESSMENT

The financial performance of primary insurers and reinsurers deteriorated in the first half of 2008. Pre-existing risks and challenges for the sector have increased and started to materialise, and are contributing to a more uncertain outlook. Higher uncertainty is also signalled by forward-looking market indicators.

The most significant risks euro area insurers currently face include:

- ⬆ financial market risks
- ⬆ risks associated with a deteriorating macro-financial environment
- ⬆ contagion risks from banking activities or ownership links to banks and other financial institutions
- ➡ longevity risks
- ➡ risk of losses from catastrophic events exceeding projected losses
- ➡ strong competition in some segments, together with an increased focus on creating shareholder value

⬆ *Increased risk since the June 2008 FSR*
➡ *Unchanged since the June 2008 FSR*
⬇ *Decreased risk since the June 2008 FSR*

It is important to bear in mind that disclosed solvency positions of euro area insurers indicate a reasonable amount of remaining shock absorption capacity to weather the materialisation of the risks they currently face.

6 STRENGTHENING FINANCIAL SYSTEM INFRASTRUCTURES

It is particularly reassuring that the key market infrastructures processing and settling euro-denominated transactions (such as TARGET2, EURO1 and CLS), infrastructure service providers (such as SWIFT) and securities clearing and settlement infrastructures all coped successfully, without any remarkable effect on their resilience, with the challenges that occurred in the last six months. It is also noteworthy that the transition from TARGET to TARGET2 was successfully completed in a timely manner. Furthermore, ongoing initiatives to strengthen euro post-trading infrastructures have gained new momentum: first, on 17 July 2008, the Governing Council of the ECB decided to launch the TARGET2-Securities project and to provide the resources required for its completion. Second, the work jointly undertaken by the European System of Central Banks (ESCB) and the Committee of European Securities Regulators (CESR) to establish harmonised recommendations for euro securities clearing and settlement infrastructures has made significant progress.

From an oversight perspective, it is pertinent that systemically important payment and settlement infrastructures function smoothly and contribute to the stability of the financial system in normal and adverse circumstances. The operational reliability and resilience of both key infrastructures and the facilities servicing these infrastructures are of particular importance in times of stress caused by, for example, turbulent market conditions or strains on liquidity, in order not to exacerbate the situation.

This section presents the main developments in euro financial infrastructures in the reporting period, highlights the related oversight activities performed and reports on the most important ongoing initiatives in connection with securities clearing and settlement services.[1]

6.1 PAYMENT INFRASTRUCTURES AND INFRASTRUCTURE SERVICES

DEVELOPMENTS IN KEY EURO PAYMENT INFRASTRUCTURES

TARGET and TARGET2

In conclusion of the phased migration to the new generation of TARGET that started in November 2007, the last group of countries (Denmark, Estonia, Greece, Italy and Poland), as well as the ECB, migrated smoothly from TARGET to TARGET2 on 19 May 2008. With the successful completion of the migration, TARGET2 has fully replaced the decentralised set-up of the old TARGET system that reached the end of its lifecycle after almost ten years of operation.

Whereas the oversight framework applied to TARGET2 has its primary focus on the safety and efficiency of the Single Shared Platform (SSP), it is recalled that not all the transactions that are eligible for TARGET2 have been channelled into the SSP so far: the national central banks (NCBs) of six countries (Belgium, Germany, Lithuania, Austria, Poland and Portugal) have decided to continue to provide limited real-time gross settlement (RTGS) services in their so-called proprietary home accounting (PHA) applications for a transitional period of at most four years in order to facilitate the migration of their banking communities to the new platform.[2] Since these PHA applications are considered decentralised components of TARGET2, given that they are closely interconnected with the SSP, the oversight of these applications continues to be the responsibility of the respective NCB,

1 The common oversight framework of the Eurosystem is governed by the following policies: Committee on Payment and Settlement Systems (CPSS), "Core Principles for Systemically Important Payment Systems", Bank for International Settlements (BIS), January 2001; ECB, "Oversight standards for euro retail payment systems", June 2003; ECB, "Business continuity oversight expectations for systemically important payment systems", June 2006.

2 In addition, Greece, Spain, Cyprus, Luxembourg, Malta and Slovenia operate PHA applications with limited functionalities and without providing RTGS services.

on the one hand, and, via the coordination of the ECB, forms an integral part of TARGET2 oversight, on the other.[3]

Operational performance

The finalisation of the migration from TARGET to TARGET2 had no remarkable effect on the growth rate of payments settled. The TARGET2 turnover remained fairly stable in terms of both value and volume in the period from April to September.[4] The average daily value settled reached €2.54 trillion, representing a daily average of 363,000 payment instructions. In addition, the predominant role of TARGET2 among the payment systems processing large-value and urgent transactions located in the euro area (TARGET2, EURO1 and POPS) was again demonstrated by its market shares of 90% in terms of the settlement value and of 59% in terms of volume.

The unprecedented high availability figures observed, particularly in the second half of the reporting period, are an indication of the beneficial effect of the integrated technical infrastructure of TARGET2 on the operational reliability of the system. Whereas the overall availability ratio reached 99.99% (99.90% in 2007),[5] there were five months (April, June, July, August and September) when the system was fully (i.e. 100%) available. In addition to the availability, the average time needed to process a payment is another key performance indicator for RTGS systems. In the reporting period, 99.85% of all transactions in TARGET2 were processed in less than five minutes (compared with 99.53% in the first quarter of 2008), while 0.12% were processed within between five and 15 minutes (0.22% in the first quarter of 2008) and 0.03% within 15 to 30 minutes (0.24% in the first quarter of 2008).

The signs of improvement in the level of robustness and the real-time processing capability of TARGET2 are promising and may, assuming that they are sustainable, become lasting factors contributing to the financial stability of the euro area.

Incidents

The monitoring and assessment by overseers of incidents that occur in a payment infrastructure are very important, as incidents may highlight weaknesses of a more general or structural nature that are embedded in the system. It is also crucial to verify how promptly and effectively incidents are managed and followed-up by the respective system operator. The TARGET2 oversight function concentrates its efforts on the analysis of major incidents, i.e. those lasting more than two hours and/or leading to a delayed closing of the system. In the second quarter of 2008, there was one such case, which affected the end-of-day/start-of-day process and ultimately led to a postponement of the night-time settlement phase. The malfunction occurred on 30 June 2008, a business day that was far from typical on account of the end of quarter/semester, when more than 558,000 payments were processed (nearly 50% more than the daily average), which was the all-time record volume since the launch of TARGET2 in November 2007. A sharp increase in information and control module (ICM) requests caused a slowdown in the ICM that prevented participants from monitoring and managing their account positions real-time and led to a number of undelivered messages accumulating during the day. In the light of these circumstances, shortly before the end of the day, it was decided to postpone the closure of TARGET2 by one hour. However, as the change of the system parameters governing the closing could not be performed in time for each SSP module, the end-of-day procedure started at the normal cut-off time. In the following, the inconsistency in the closing times of the different modules confounded the system and stopped the closing process, and resulted in a rejection of a number of payments that had meanwhile been initiated in the system. Following the fixing of these problems, the closing of the business day,

3 The ECB oversight function leads and coordinates all TARGET2-related oversight activities in close cooperation with the participating NCBs.

4 The turnover figures presented hereafter for TARGET2 include data on (i) TARGET2 SSP, (ii) the TARGET components until their migration and, (iii) the PHA applications.

5 This is the ratio of the time when TARGET is fully operational to the TARGET operating time.

as well as the night-time settlement procedures, were performed successfully.

After having investigated the root cause(s) of the problems, the TARGET2 service provider was still in the process of implementing the follow-up actions at the time of the finalisation of this FSR.

Termination of Lehman Brothers' participation

In the course of the recent market turmoil, there was one event that required a prompt response on the part of the TARGET2 operators, as well as by some other key euro market infrastructures, namely the announcement that Lehman Brothers, one of the leading global investment banks based in the United States, had filed for bankruptcy on 15 September 2008. The collapse of the parent company affected its subsidiaries throughout Europe. On the same day, upon request of the regulatory bodies of the relevant countries, the TARGET2 accounts of Lehman Brothers were terminated with immediate effect.[6] The TARGET2 oversight function was informed about this coordinated action of the responsible NCBs in a timely manner. The general conclusion of TARGET2 oversight was that the complex process of the termination of Lehman Brothers' participation in the different TARGET2 components had been adequately managed, that the applicable system rules had been properly followed, thereby preventing the liquidity risk of a significant TARGET2 participant from spilling over to other participants in the system.

Liquidity management

TARGET2 provides the participants with a wide range of tools for the management of liquidity risk, such as liquidity pooling, the setting-up of bilateral and multilateral liquidity limits, a prioritisation of payments and queue management facilities.

In an RTGS system, where incoming funds are usually pre-calculated and actively used to cover outgoing payments, the predictability of payment flows among counterparties during the business day is decisive for effective liquidity management and, ultimately, contributes to reducing the overall liquidity risk in the system. From this perspective, it is important that the pattern of intraday payment flows in TARGET2 remained fairly stable in the reporting period. In June 2008, for instance, 26% of the value of payments had, on average, been settled by 10 a.m., 54% by 1 p.m. and 94% by 5 p.m.

As a further contribution to enhancing efficiency in intraday payment flows, the schedule of settlements in the various ancillary systems has been clarified to TARGET2 participants, which helps them to plan and control their liquidity flows. This information is deemed particularly useful for large and complex banking groups (LCBGs) that have account relationships with various infrastructures settling in central bank money in TARGET2 to optimise their allocation of liquidity to these ancillary systems.

CLS

The Continuous Linked Settlement (CLS) system primarily provides a multi-currency service for the synchronous, i.e. payment-versus-payment (PvP), settlement of payment instructions involving foreign exchange (FX) transactions with finality. Through its PvP mechanism, CLS virtually eliminates FX settlement risk,[7] thereby offering protection against the loss of principal associated with FX trades. In the event of a settlement failure by one party to a trade, the principal will be returned to the other party. Since end-2007, CLS has also settled single-currency payment transactions that are linked to a limited set of financial instruments, i.e. over-the-counter (OTC) transactions in derivatives, which are housed in the DTCC Deriv/SERV LLC Trade Information Warehouse, and non-deliverable forward (NDF) transactions.[8] CLS was launched in

6 Such termination in TARGET2 means that each transaction involving the accounts of the terminated participant is subject to prior confirmation by the responsible central banks before settlement.

7 FX settlement risk is defined as the risk that one party to an FX transaction will pay the currency it has sold, but not receive the currency it has bought.

8 Single-currency payment transactions that are linked to FX option premia may also be settled via CLS, but the service had not yet gone live on the cut-off date for this FSR.

September 2002, starting with seven of the world's mostly traded currencies. Since June 2008, CLS has also settled the Mexican peso and the Israeli shekel. The new currencies have joined the existing 15 currencies that were already eligible for settlement via CLS, namely the Australian dollar, the Canadian dollar, the Danish krone, the euro, the Hong Kong dollar, the Japanese yen, the Korean won, the New Zealand dollar, the Norwegian krone, the Singapore dollar, the South African rand, the Swedish krona, the Swiss franc, the pound sterling and the US dollar.

CLS is important for financial stability in the euro area and the proper functioning of the global financial system. From the Eurosystem's perspective, CLS is the largest infrastructure that settles payment transactions in euro outside the euro area. From a global perspective, CLS is the payment infrastructure with the highest settlement value (in USD equivalent) worldwide.

CLS is managed by CLS Bank International (CLS Bank), which is incorporated in New York. CLS Bank acts as the settlement institution for the CLS settlement members. The Federal Reserve System charters, regulates and supervises CLS Bank. Under its payments system risk policy, the Federal Reserve System has classified CLS as a systemically important payment system. Given its multi-currency nature, CLS is subject to cooperative oversight under the principles for international cooperative oversight.[9] Under the CLS cooperative oversight arrangement, the Federal Reserve System accepts primary responsibility for the oversight of CLS. The G10 central banks and the central banks whose currencies are settled in CLS participate in the cooperative CLS oversight arrangement. Within the Eurosystem, the ECB is the central bank with primary oversight responsibility for the settlement of the euro by CLS.

Given the systemic relevance of CLS for the global financial system, the overseers engaged in the cooperative oversight of CLS carefully assess CLS' compliance with the Core Principles. In addition, CLS Bank is required to carry out self-assessments against the Core Principles.[10] Individual central banks also expect CLS to be compliant with their applicable policies, such as "The Eurosystem policy principles on the location and operation of infrastructures settling euro-denominated payment transactions".[11]

CLS' business has been growing continuously. The main factors are the increasing turnover in the FX market and new participants, in particular third parties.[12] High market volatility in the context of the financial market turmoil that has been ongoing since August 2007 is regarded as an additional factor. The volumes and values of single-currency transactions settled in CLS, i.e. instructions relating to OTC credit derivatives and NDF transactions, are still negligible in relative terms, but have (on average) been growing constantly in absolute terms since CLS Bank has offered its settlement service for these instructions.

Looking at the period from 1 April 2008 to 30 September 2008, CLS has seen two new record volumes. Following Independence Day in the United States, a USD currency holiday in CLS, CLS settled 1,147,646 sides on 7 July 2008 (the previous record volume was 1,140,644 sides on 13 November 2007).[13] This record was topped on 17 September 2008, when CLS settled 1,554,166 sides in the light of a quarterly settlement date for the FX futures market and high spot trading activity as a result of general market volatility. The record value

9 See BIS, "Central bank oversight of payment and settlement systems", May 2005.
10 CLS Bank published a self-assessment in December 2007.
11 See ECB, "The Eurosystem policy principles on the location and operation of infrastructures settling euro-denominated payment transactions", July 2007.
12 Third parties are institutions that are not members of the CLS system but have indirect access to it through CLS settlement members who agree to be responsible as principal for the third parties' payment instructions in CLS Bank. In September 2008, there were more than 3,300 third parties in CLS.
13 Sides are equivalent to legs. For example, a spot or forward trade has two currency legs (one for each currency), while a swap has four (two for the spot trade and two for the forward trade).

of USD 10,340 billion equivalent, which was achieved on 19 March 2008, still holds. The daily average number of sides settled in CLS between April and September was 547,919 and the average total daily gross value was USD 4.14 trillion equivalent (see Chart S135),[14] eliminating FX settlement risk of approximately USD 3.98 trillion equivalent.[15] Net funding averaged around USD 54 billion equivalent or 1.3%. The euro values settled via CLS in this period amounted to USD 840 billion equivalent, eliminating FX settlement risk of approximately USD 810 equivalent (see Chart S135). By comparison, the average daily volume of payment instructions settled in TARGET in the period from April to September 2008 was 363,000 and the average daily value was €2.54 trillion. The euro is the second most settled currency in CLS, with a share of approximately 20% (45% for the US dollar).

As in the past, CLS settlement continued to be robust between April and September 2008. CLS has managed to integrate two additional settlement currencies, namely the Mexican peso and the Israeli shekel, and has dealt with exceptional market circumstances and exceptionally high numbers of payment instructions in a positive manner. CLS achieved 100% settlement completion for all payment instructions that were eligible for settlement and a 100% pay-out rate of the funds in the currencies involved via the relevant RTGS systems, such as TARGET2. Incidents, which have led to minor delays in the achievement of business events, are assessed and necessary changes induced, where applicable.

EURO1

As from 7 July 2008, EBA CLEARING, the operator of the EURO1 system, established two further distribution windows in addition to the existing liquidity distribution windows under the Liquidity Bridge at 2 p.m. and 3 p.m. CET, namely one at 1 p.m. and the other one at 3.30 p.m. The Liquidity Bridge is a functionality that allows participants to distribute liquidity between EURO1 and TARGET2 on an intraday basis, thus improving the conditions for the processing of payments that may be on hold because the receiving participants' credit balances have approach their credit caps.

In May 2008, the ECB oversight function assessed ex ante the potential impact of this development on the compliance of EURO1 and TARGET2 with the applicable oversight standards and concluded that the establishment of the two additional liquidity distribution windows would be of benefit from both a EURO1 and a TARGET2 perspective.[16] Accordingly, the ECB communicated to EBA CLEARING that it had no objections to the establishment of the new additional liquidity distribution windows.

OVERSIGHT OF INFRASTRUCTURE SERVICE PROVIDERS

SWIFT

SWIFT is the Society for Worldwide Interbank Financial Telecommunication, a member-owned cooperative that provides messaging services for most of the market infrastructures and financial institutions operating in Europe and other regions. Over past years, SWIFT message traffic across the various regions and financial market segments has been increasing steadily. In 2008 statistics published by SWIFT show that more than 90% of the messaging traffic involved payment and securities-related messages exchanged between financial institutions and their customers. The increase of

14 Figures include instructions related to single and multi-currency transactions. For multi-currency transactions, it should be noted that each settlement leg in each of the relevant currencies is counted separately and is reflected as such in the volume and value figures.

15 The reduction of FX settlement risk is smaller than the values actually settled in CLS because participants trade down their positions in CLS via so-called inside/outside swaps ("I/O swaps"), whereby two CLS settlement members conclude two opposite trades, with one to be settled in CLS (the inside leg of the swap) and the other one to be settled outside CLS (the outside leg of the swap), e.g. via traditional FX settlement methods such as correspondent banking. Because the outside leg of the swap reintroduces FX settlement risk, the value of the "I/O swaps" needs to be deducted from the values settled in CLS to obtain the true reduction of FX settlement risk achieved by CLS.

16 The ECB is the primary overseer of EURO1.

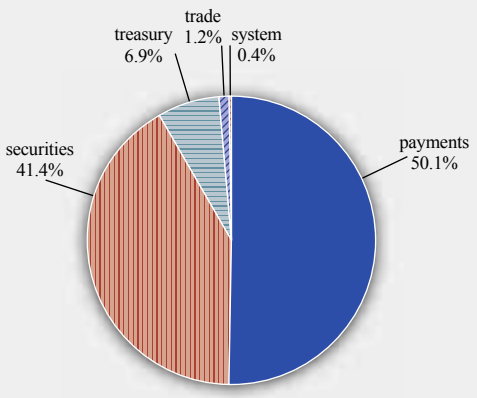
securities-type messages exchanged via SWIFT accounted for almost 50% of the total messaging growth in 2008. Nevertheless, payment messages exchanged via SWIFT's SWIFTNet FIN messaging platform continue to account for more than 50% of the total traffic exchanged through SWIFT (see Chart 6.1).

The large majority of these messages (approximately 68%) were exchanged by participants located in Europe, the Middle East and Africa.

The increased dependence of market infrastructures and their participants on SWIFT's messaging services implies that SWIFT should maintain appropriate measures and procedures to ensure the highest availability and resilience for its messaging services, something that is crucial for global financial stability. For that reason, the G10 central banks, including the ECB, with the Nationale Bank van België/Banque Nationale de Belgique as lead overseer, that are involved in the cooperative oversight of SWIFT review thoroughly and discuss these arrangements with SWIFT's management, Board representatives and its Internal Audit function, all of which provide valuable input into this process. During the last few months, SWIFT and the overseers have been engaged into discussing SWIFT's compliance with the high-level expectations (HLEs) for the oversight of SWIFT (see the December 2007 FSR). As a result of this interaction, SWIFT has produced a self-assessment against the HLEs intended for an audience of overseers and other supervisory bodies.

Chart 6.1 SWIFTNet FIN message traffic

(Aug. 2007 – Aug. 2008)



Source: SWIFT – SWIFTNet FIN August 2008 YTD Traffic.

Over the past few months, many developments of both a business and an infrastructure nature have taken place at SWIFT. The most important of these developments relates to SWIFT's announcement in September 2007 that it will move to a multi-zone messaging architecture by adapting its IT infrastructure accordingly. According to SWIFT, its processing will be divided into two zones, namely the Transatlantic and the European zone, with the aim of increasing the processing capacity of its infrastructure, enhancing its resilience further and meeting European data protection requirements. Customers of SWIFT who are based in Europe will automatically be assigned to the European zone, with all their intra-European traffic being processed and stored in Europe. The two phases of the project are expected to be finalised by 2010 and 2013 respectively.

Due to the importance of SWIFT's infrastructure for global financial stability, the G10 central banks, including the ECB, with the Nationale Bank van België/Banque Nationale de Belgique as the lead overseer, have been closely monitoring developments concerning both phases of this programme.

Finally, other developments at SWIFT that might have an impact on its operational security, availability and resilience will be reviewed, with emphasis on its risk management, information system (IS) security policy and the governance of its corporate IS Audit function.

6.2 SECURITIES CLEARING AND SETTLEMENT INFRASTRUCTURES

ESCB-CESR

There is a need for a harmonised regulatory framework for clearing and settlement in the EU because of (i) the divergence of national

risk reviews that impedes coherence regarding the safety and soundness of the European post-trading infrastructure and (ii) the absence of a level regulatory playing field for clearing and settlement. The lack of uniform standards would be felt in TARGET2-Securities (T2S), which will require cooperative oversight involving both overseers and securities regulators (further benefits of T2S from a financial stability perspective are presented in Box 14). A number of initiatives are under way in this respect, including ESCB-CESR recommendations that intend to close this gap and ensure the safety and soundness of the securities clearing and settlement infrastructure providers in Europe.

After intensive efforts, the Ecofin Council formally invited the ESCB and the CESR on 3 June 2008 to adapt and finalise the earlier draft "Standards for securities clearing and settlement in the EU" by autumn 2008, respecting a number of principles, namely: (i) that the adopted text should take the form of non-binding recommendations addressed solely to public authorities; (ii) that its scope should include international central securities depositories (ICSDs) and exclude custodians; and (iii) that with respect to credit and liquidity risk controls, the benchmark accepted by the G10 – namely the CPSS-IOSCO Recommendation 9 for securities settlement systems of 2001 – should be adopted. The Financial Services Committee (FSC) was mandated to "monitor progress to ensure that there are no remaining gaps to be addressed and to reassess the situation by end-2008" and to "assess the impact of its implementation on enhancing the level playing field, investor protection and prudential safety by mid-2010".

The finalisation of the ESCB-CESR recommendations was started on the basis of the guidelines of the Ecofin Council. On 23 October 2008, a public consultation of three months' duration on the draft recommendations was launched. Final approval by the respective decision-making bodies has been scheduled for the beginning of 2009.

Box 14

T2S – EUROPE'S INTEGRATED SECURITIES SETTLEMENT PLATFORM, AND ITS CONTRIBUTION TO FINANCIAL STABILITY

On 17 July 2008, the Governing Council decided, after two years of intense cooperation with users and providers of settlement services, to build a new settlement platform, TARGET2-Securities (T2S). The Deutsche Bundesbank, the Banco de España, the Banque de France and the Banca d'Italia will build and operate T2S; an ECB team will continue to manage the overall programme, and its relationship with all stakeholders inside and outside the Eurosystem. T2S is expected to become operational in 2013.

T2S is a single, sharable, multi-currency platform for the settlement of securities transactions in central bank money. Participation in T2S will be voluntary and its services will be provided on a full cost recovery basis to participating Central Securities Depositories (CSDs), which will adjust their business models accordingly, in particular by reducing or eliminating investment in their own settlement engines.

The figure below illustrates the key features: CSDs will keep securities accounts for market users just as they do today, with the balances retained in T2S for settlement purposes, while central banks will provide and maintain central bank money balances in T2S, via an interface

to TARGET2 (or another RTGS system in the case of non-euro currencies). Settlement (and cross-CSD matching) will be handled by T2S, and will be subject to the existing legal regimes of the relevant CSDs.

On top of the financial gains from a sharp reduction in the number of settlement platforms, market users will benefit from significant process harmonisation in that there will be no difference between domestic and cross-border settlement in Europe.

Moreover, T2S has the potential to act as a catalyst for the wider harmonisation of post-trading processes, with the Eurosystem adding its weight to the existing initiatives in such areas as legal change and corporate actions.

All euro area CSDs have committed to participate in T2S, and there is strong interest from markets in several other countries. There are clear signs that CSDs are taking active steps to prepare for a future in which they can continue to offer their current range of services, business and legal relationships with customers (all using the same single settlement platform), but will face the threat of competition and have the opportunity to enlarge the range of assets they offer and service.

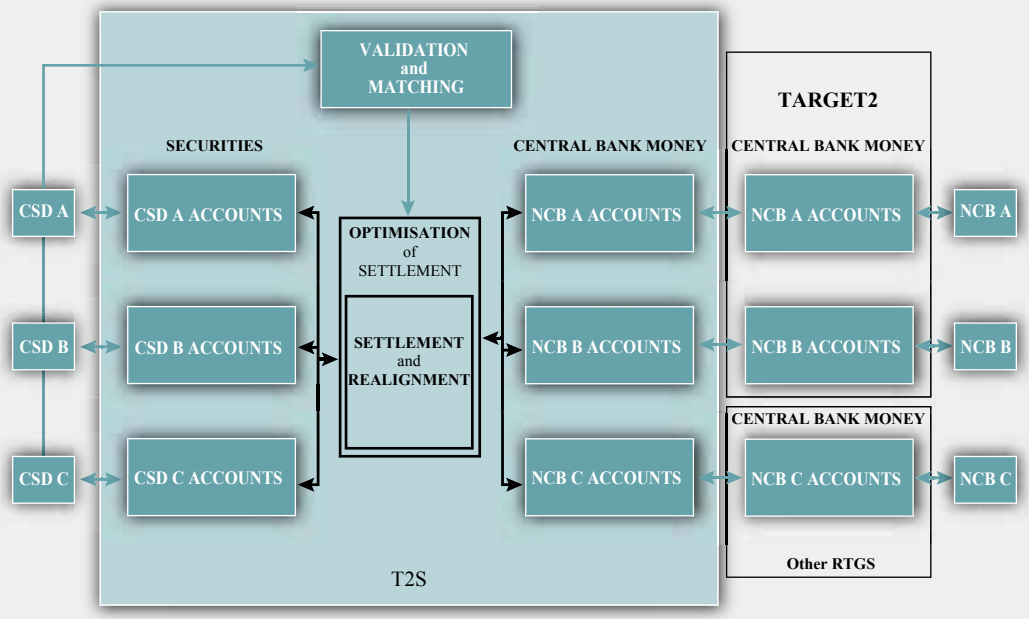
The Eurosystem has a strong interest in the smooth functioning of settlement infrastructures in terms of preserving financial stability; a disruption in a settlement system, particularly at a time of financial stress, may constitute a source of contagion risk by inhibiting the timely exchange of collateral and payments. Europe has multiple, often interdependent, trading and post-trading systems. Consequently, the operational risks of each system are directly linked to those of other systems within the value chain; a failure in any one system may result in disruption passing swiftly across systems and their participants, with second-round effects on other market activities.

The cooperation between the Eurosystem and the European CSDs to deliver and run T2S will bring a robust, efficient and resilient securities settlement infrastructure, efficiently coupled to TARGET2 and to other RTGS systems. T2S will provide a single platform, replacing the different settlement platforms of those CSDs that join T2S, and it will significantly simplify today's settlement interactions across markets. An important dimension of crisis management will thus become simpler, more transparent and more secure for market users and public authorities alike.

The work on wider harmonisation will contribute to this improvement, by simplifying the necessary processing. The greater the harmonisation, the better the prospects for a more timely identification of risks – and the corrective measures required – to safeguard the stability of financial markets.

Of course, T2S will create a concentration risk in securities settlement, which has to be mitigated. T2S will have state-of-the-art business continuity and contingency models, exploiting the architecture and infrastructure already in place for TARGET2, so that the Eurosystem can continue to operate even after a variety of unpredictable events ranging from local equipment failures to a regional disaster.

Cooperation between the Eurosystem and CSDs in using one technical platform for all securities and cash accounts to settle securities transactions



Source: ECB.
Note: Exchanging the securities (in the CSD securities accounts in T2S) for the cash payment (in the NCBs' cash accounts in T2S) are linked in T2S, for delivery versus payment in a synchronised and safe environment in central bank money. In addition to all euro area CSDs, Danmarks Nationalbank and VP (the Danish CSD) intend to use T2S to offer settlements in euro and Danish krone. Other European currencies and CSDs are expected to do likewise.

T2S will follow the concept of two regions, two sites, as is already in place for TARGET2. If the "live and operating" T2S system fails, the other T2S system in the same region will immediately take over without impacting smooth operations.

Two additional sites will be available in a second region within the euro area, and T2S will be able to resume operations at these sites as required.

Furthermore, T2S will adopt prudent risk management principles, which will include performing stress-testing exercises to ensure the resilience of the links between T2S, the CSDs and major market participants.

There is a further systemic advantage of T2S. T2S will facilitate the possibility of market participants across Europe pooling all of their securities into one system for settlement purposes – just as cash is now pooled in TARGET2 – no matter which CSD they choose; there will be no need to manage the allocation of securities and central bank money across many national platforms. This increase in the settlement efficiency of collateral management (and the reduction of collateral and liquidity needs) will make it easier to quickly mobilise securities for other purposes. This has ongoing economic value – but is of systemic benefit in a financial crisis, when credit institutions need to mobilise liquidity against collateral.

The single securities settlement environment using central bank money will be delivered by 2013, and will contribute to the safety and efficiency of the single market for capital.

OTC derivatives

One issue that continued to receive great attention in the second half of 2008 was the need to enhance the infrastructure for over-the-counter (OTC) derivatives, as highlighted by the Financial Stability Forum (FSF) in April, in response to the financial market turbulences.[17] Despite the explosive growth of OTC derivatives in recent years, the infrastructure for clearing and settling OTC trades is still predominantly bilateral and non-standardised, and continues to require a considerable degree of manual intervention. OTC markets have therefore struggled to cope with the rising volumes and increasing complexity of derivatives trades. This became apparent during the financial turmoil, when processing backlogs and corresponding uncertainties about counterparty risk resurfaced.

Similar problems had already raised concerns on a number of occasions since the late 1990s and have triggered several initiatives to strengthen the OTC infrastructure in recent years, particularly for credit derivatives. While those measures fostered progress towards more automated procedures and an enhanced standardisation and documentation of derivatives contracts, the recent difficulties clearly demonstrated that more needed to be done. Another priority highlighted was the need to enhance counterparty risk management for OTC derivatives, in particular through netting and collateralisation arrangements.

Against this background, in June 2008 major market participants and their competent authorities agreed on an agenda for addressing weaknesses in the operational infrastructure of the OTC derivatives market.

While these measures relate to all major asset classes – interest rate derivatives, foreign exchange derivatives, credit derivatives, equity derivatives and commodity derivatives – particular attention has been paid in recent months to enhancing the resilience of the credit default swap (CDS) markets, given their strong growth, as well as their close links to credit markets and their corresponding significance for systemic financial stability. Owing to the high degree of concentration of the CDS markets, the effective reduction of counterparty risk is particularly important. The urgency of the issue had been underscored by the near-collapse of Bear Stearns in March 2008, an important counterparty in CDS markets at the time, which could only be prevented through the take-over of Bear Stearns by JPMorgan Chase & Co.

As part of the aforementioned agenda agreed in June 2008, a number of measures were initiated to reduce counterparty risk in the CDS markets, aiming at trade compression, the introduction of an auction-based settlement mechanism in standard credit derivatives documentation and, most importantly, the establishment of a central counterparty (CCP) for CDSs. As regards the latter, concrete industry proposals were put forward in the United States by The Clearing Corporation in May 2008 and in Europe by both Eurex and Liffe in July 2008.

Before these initiatives could be implemented, however, the turmoil on the CDS markets reached dramatic proportions in September 2008. In particular, the seizure of the US mortgage groups Fannie Mae and Freddie Mac by the US government and the collapse of Lehman Brothers triggered credit event provisions on a huge amount of CDS contracts, accompanied with a degree of operational uncertainty as to how these contracts would be settled. However, this issue was successfully resolved by two cash-settlement auctions based on the respective ISDA protocols.

In response to these dramatic developments, the discussion on measures to enhance the infrastructure for OTC derivatives in general, and for CDS markets in particular, gained momentum in both the EU and the United States. In the EU, the European Parliament's Committee on Economic and Monetary Affairs (ECON) included a call in its report on the

17 See Financial Stability Forum, "Report of the Financial Stability Forum on Enhancing Market and Institutional Resilience", April 2008.

future structure of supervision, published on 18 September 2008, for legislative measures to increase the transparency of the OTC markets, including, where appropriate, measures to encourage market participants to clear OTC trades in clearing houses.

IV SPECIAL FEATURES

A RECENT POLICY INITIATIVES TO STRENGTHEN THE RESILIENCE OF THE FINANCIAL SYSTEM

This special feature summarises the main policy initiatives that are aimed at strengthening the resilience of the financial system, both at the international and at the European level. Because events in financial markets are continuing to unfold, triggering prompt responses by governments and supervisors, this special feature can, at this stage, only provide an interim overview of the major initiatives taken thus far.

INTRODUCTION

At the Eurogroup summit in Paris on 12 October, the euro area countries adopted a concerted action plan with the aim of restoring confidence in the markets and promoting the proper functioning of the financial system. A few days later, on 15 and 16 October, the EU summit endorsed the principles laid down in the Paris declaration. In accordance with the principles on improving the liquidity and solvency conditions for financial institutions, national governments and central banks in Europe have taken a number of extraordinary measures that range from offering government guarantees for bank debt issuance and retail deposits to providing additional capital resources to distressed banks.

While these measures were taken to cope with the recent intensification of strains in the financial sector, reflection on possible regulatory measures to strengthen the financial system had started at the international and European level with the onset of the turmoil in August 2007. This reflection led to concrete initiatives seeking to address the weaknesses identified thus far, including proposals on revising the regulatory framework and strengthening authorities' ability to respond to crisis situations.

At the international level, regulatory and supervisory initiatives are being coordinated by the Financial Stability Forum (FSF). The framework for policy responses to the financial turmoil was set up in April 2008, when the FSF published its "Report on Enhancing Market and Institutional Resilience".[1] The report, which has been endorsed by G7 finance ministers and central bank governors, and has thus become an international benchmark, consisted of a comprehensive set of recommendations for regulatory and supervisory authorities, as well as for central banks. The FSF report called for action in the following five main areas: (i) strengthening capital, liquidity and risk management in the financial system; (ii) enhancing transparency and valuation; (iii) changing the role and use of credit ratings; (iv) strengthening authorities' responsiveness to risks; and (v) putting in place robust arrangements for dealing with stress in the financial system.

At the European level, the Ecofin Council set out a work programme ("Roadmap") in October 2007, in which it defined actions with regard to (i) enhancing transparency for investors, markets and regulators, (ii) improving valuation standards, including illiquid assets, (iii) reinforcing prudential rules and risk management in the financial sector, and (iv) improving the functioning of markets, including the role of credit agencies. The Roadmap was revised and updated at the Ecofin Council meeting on 14 May 2008 and, since then, follow-up work has been taking place continuously in order to provide consistency and ensure an effective coordination with other international fora, in particular the Financial Stability Forum.

THE IMPLEMENTATION OF THE POLICY INITIATIVES

In accordance with the work programmes defined by the FSF and the Ecofin Council, authorities have been undertaking substantial efforts to implement the recommendations and action plans in a timely and coordinated manner. Since the onset of the turmoil, these efforts have resulted in a number of concrete steps being

1 See Financial Stability Forum, "Report of the Financial Stability Forum on Enhancing Market and Institutional Resilience", April 2008.

taken. The priority recommendations identified by the G7 in April were all addressed on time, and the implementation of the Ecofin Council's Roadmap is also on track. As to the current status of the implementation measures, the following short summary can be provided.[2]

PRUDENTIAL OVERSIGHT OF CAPITAL, LIQUIDITY AND RISK MANAGEMENT

The competent authorities have identified imperfections in banks' risk management systems and risk governance as factors contributing substantially to the accumulation of risky exposures over the last few years, both on and off the balance sheets.[3] In addition, substantial weaknesses in the related regulatory and supervisory framework have also been identified by policy-makers. Therefore, in order to address the lessons learnt thus far, regulators have launched a number of initiatives pertaining to the revision of the current regulatory setting for the prudential oversight of capital, liquidity and risk management.

With regard to *capital* issues, the revision of the Basel II capital requirements, carried out under the auspices of the Basel Committee on Banking Supervision (BCBS), is considered a core element of the regulatory response. In this context, proposals related to the revision of capital requirements for securitisation exposures and the associated liquidity facilities will be set out by the BCBS later this year. In addition, the BCBS and the International Organization of Securities Commissions (IOSCO) proposed a number of modifications to the current framework of trading book regulation in July. In this regard, capital requirements for banks' trading book exposures will be raised, as set out in the "Guidelines for Computing Capital for Incremental Risk in the Trading Book".

In line with international initiatives on capital regulation, the revision of the Capital Requirements Directive (CRD) is also under way in the EU, with the envisaged adoption of two comitology directives and one co-decision proposal in early 2009. As a direct follow-up to the Ecofin Council's Roadmap, the modification of the CRD aims at providing a long-term response to the turmoil. In this context, the rules on large exposures, capital quality, securitisation and liquidity risk management, as well as on supervisory cooperation, are being revised.

With respect to *liquidity* issues, the BCBS published a document on the "Principles for Sound Liquidity Risk Management and Supervision" in September. The timely and effective implementation of the principles is expected to substantially improve the risk management standards of banks, as well as their resistance against prolonged liquidity shocks. In this connection, the BCBS also intends to achieve greater convergence in liquidity supervision for cross-border banking groups.

As a closely related initiative at the EU level, the Committee of European Banking Supervisors (CEBS) published its advice on liquidity risk management, including 30 principles-based recommendations for financial institutions and supervisory authorities, on 18 September.[4] The recommendations aim at ensuring that adequate liquidity risk management is in place at financial institutions, both for normal circumstances and for times of stress. As they are generally consistent with the BCBS principles, the CEBS recommendations build on the diversification of funding sources, appropriate liquidity buffers, robust stress tests and regularly tested contingency funding plans. The document assigns ultimate responsibility for defining an institution's liquidity risk strategy and risk tolerance to the Board of Directors, emphasising that it should be appropriate to the institution's funding profile, its current and prospective activities and the robustness of its risk management. In addition, clear responsibilities

2 This summary is partly based on Financial Stability Forum, "Report of the Financial Stability Forum on Enhancing Market and Institutional Resilience. Follow-up on Implementation", October 2008.

3 See Special Feature B in this Review for more details on the risk management lessons learnt from the turmoil.

4 See Committee of European Banking Supervisors, "CEBS's technical advice on liquidity risk management (second part)", September 2008.

and proper incentives should be laid down by senior management, reflecting the long-term objectives of the respective institution. With regard to supervisory issues, the document calls for enhanced coordination between authorities, notably through the active use of supervisory colleges.

To complement the work carried out by the BCBS and CEBS, the Banking Supervision Committee (BSC) has also prepared a report on EU banks' liquidity stress testing and contingency funding plans",[5] providing a typology of EU banks' practices in this field.

Based on these documents, and in line with both the Ecofin Council's Roadmap and the FSF recommendations, the European Commission has proposed changes to the CRD. These proposals concern the development of liquidity risk management policies and systems, including, among other things, the improvement of stress testing practices and conditions for cross-border liquidity transfers, as well as a strengthening of the role of senior officers in defining risk tolerance levels.

As to the issue of *supervisory oversight* of risk management, the BCBS is enhancing its guidance on the oversight of firm-wide risks and the management of securitisations and other off-balance-sheet exposures, as well as of concentration, reputation and liquidity risks. As an element of reinforcing the supervisory review process under Pillar 2 of the new capital framework, the BCBS will also be developing principles for sound stress testing practices by the end of this year.

Finally, as regards *compensation policies*, the turmoil has revealed that flawed incentives, created by inadequate remuneration policies of banks and other financial intermediaries, have also played a role in the accumulation of vulnerabilities in the financial sector over past years. Therefore, the revision of these policies is considered by international bodies to be a necessary precondition for increasing the long-term stability of the financial system, thus also protecting taxpayers' money. Indeed, the FSF recommended in April that the financial industry align its compensation models to long-term, firm-wide profitability and that regulators and supervisors work with market participants to mitigate the risks arising from inappropriate incentive structures.

In order to comply with this request, two industry groups have recently addressed compensation issues. First, the Institute of International Finance (IIF) published its report on market best practices in July,[6] including, among other things, principles of conduct on compensation policies. In a similar report published in August, the Counterparty Risk Management Policy Group III (CRMPG III) also identified compensation schemes as one of the primary driving forces of the turmoil, concluding that compensation practices should be based on the performance of the bank as a whole.[7] More recently, both the European Council and the Ecofin Council have emphasised that the real performance of company executives should be reflected in their remuneration, including their severance pay, and that care should be taken to ensure that the system of remuneration does not lead to excessive risk-taking or any extreme concentration on short-term objectives.[8]

TRANSPARENCY AND VALUATION

As regards *transparency*, in its report of April 2008, the FSF urged financial institutions to make robust risk disclosures and set up a disclosure framework with the aim of expanding the scope and reliability of information made available to the public about banks' risk exposures, valuation practices,

5 See, ECB, "EU banks' Liquidity stress testing and contingency funding plans", November 2008.
6 See Institute of International Finance, "Final Report of the IIF Committee on Market Best Practices: Principles of Conduct and Best Practice Recommendations", July 2008.
7 See Counterparty Risk Management Policy Group III, "Containing Systemic Risk: The Road to Reform. The Report of the CRMPG III", August 2008.
8 See Meeting of the European Council, Brussels, 15 and 16 October 2008 and meeting of the Ecofin Council, Brussels, 7 October 2008.

off-balance-sheet entities and related policies. The implementation of the enhanced disclosure framework is being strongly encouraged by supervisors and national authorities worldwide. These efforts have led to more detailed qualitative and quantitative information about risk exposures already being given in the mid-year reports of large financial institutions.

At the EU level, in October the CEBS published the findings of an analysis on the application of its best practice recommendations, as set out in the "Report on banks' transparency on activities and products affected by the recent market turmoil" of June 2008. In the follow-up report, the CEBS concluded that more than three-quarters of the banks provided detailed disclosures on the impact of the market turmoil and on exposure levels, indicating an improvement in comparison with the previous assessment. However, their disclosures on business models and risk management practices, as well as on accounting and valuation practices, proved to be less detailed, giving rise to the need for banks to undertake further efforts to comply with the good practices identified by the CEBS in its previous report. Since enhancing disclosure is considered by authorities to be an important prerequisite for restoring confidence, the implementation of good practices is being strongly promoted by the CEBS's members.

With respect to the revision of *valuation standards*, the International Accounting Standards Board (IASB) finalised its guidance on the valuation of financial instruments in illiquid markets in October, bringing it into line with similar guidance issued by the Securities and Exchange Commission (SEC) and the Financial Accounting Standards Board (FASB) in the United States. In the same vein, the standards for the consolidation of off-balance-sheet entities and related risk exposures are also being revised by the IASB and the FASB. Indeed, the principle that any distortion of treatment between US and European banks due to differences in accounting rules should be avoided was underlined by the Ecofin Council on 7 October. The IASB and the FASB have also taken steps to enhance convergence with regard to the issue of asset reclassification.

As regards the related supervisory tasks under Pillar 2 and Pillar 3, the BCBS issued a consultative paper, "Supervisory guidance for assessing banks' financial instrument fair value practices" in November 2008, for comments by February 2009.

CREDIT RATINGS AND THE FUNCTIONING OF MARKETS

The expansion of the *originate-to-distribute business model*, where credit originators no longer hold their credit exposures in their books, but securitise and sell them to a wide variety of investors, has led to an explosive growth of the outstanding amount of securitised assets and related derivative instruments over the past two decades or so. These developments in securitisation were supported by the increasing role played by credit rating agencies (CRAs) in the process, which aimed at mitigating the substantial informational asymmetries between issuers and investors.

However, the lack of transparency in these markets, as well as the over-reliance of market participants on external ratings, together with a poor understanding of the nature of ratings and weaknesses in the rating process (including certain conflicts of interest between CRAs and their clients), seriously undermined investor confidence, once complex financial products had been downgraded. Thus, the shortcomings of this business model and the opacity of the markets made it difficult for market participants and authorities to identify where the risks were accumulating in the system and to assess the possible losses from these exposures.

In this context, the ECB, in cooperation with the BSC, prepared a report that discussed the incentive structure of the "originate-to-distribute model" that revealed a range of misaligned incentives that had been created by

a variety of principal-agent relationships in the business model.[9] These shortcomings resulted in lax lending standards being applied by originators, as well as in inadequate due diligence and monitoring by investors, financial intermediaries and credit rating agencies.

With regard to regulatory proposals on *credit rating agencies,* authorities have launched a number of initiatives that are aimed at improving the quality of the rating process, managing conflicts of interest and enhancing the due diligence performed by the parties involved in structured finance. In this context, the revision of the IOSCO's "Code of Conduct Fundamentals for Credit Rating Agencies", published in May 2008, can be considered a major step towards this end. The adoption of the Code by CRAs will be reviewed by the IOSCO, with the findings scheduled to be published in January 2009.

At the EU level, in July 2008 the European Commission launched a public consultation on a draft regulatory proposal on the conditions for authorisation, operation and supervision of CRAs in the EU. The formal proposal on CRAs was adopted by the Commission on 12 November 2008.

SUPERVISORY COOPERATION AND CRISIS MANAGEMENT

Enhancing *cooperation* and improving the *exchange of information* between authorities are key to dealing with the challenges posed by the financial turmoil. In particular, initiatives that have recently been launched by authorities in this field focus primarily on addressing cross-border issues, an important element of which is the development of protocols for establishing supervisory colleges for major global financial institutions under the auspices of the FSF. At the European level, the CEBS has reviewed good practices for colleges and an assessment of their operation is expected to be carried out early next year.

In the same vein, the European Commission's proposal on the revision of the CRD seeks to enhance exchanges of information between authorities, also by increasing the rights to information of host country supervisors of systematically relevant branches.

As regards *crisis management*, authorities in Europe are paying special attention to the effective implementation of the Memorandum of Understanding (MoU) on cross-border financial stability that was signed by central banks, supervisors and finance ministries in 2008. In that context, as part of the follow-up work agreed by the Ecofin Council in 2007 for strengthening the EU arrangements for financial stability, the authorities have been requested to implement the common framework for assessing the systemic impact of a crisis by the end of this year.

In the forthcoming revision of the CRD, the powers of the consolidating supervisor will be reinforced and the allocation of responsibilities in crisis situations will be clarified further. In particular, a provision will impose an obligation on the consolidating banking supervisor to alert interested central banks and communicate to them all necessary information whenever an emergency situation arises that has the potential to jeopardise financial stability in any of the Member States in which the banking group concerned is present through subsidiaries or systemically relevant branches.

Finally, the existing crisis resolution policies are currently being analysed by the BCBS, with special emphasis on the allocation of responsibilities and legal frameworks, in order to identify possible ways of improving the cross-border crisis resolution procedures.

With respect to *depositor protection*, in April 2008 the G10 countries agreed to review and strengthen their deposit insurance

9 See ECB, *EU banking structures*, October 2008.

arrangements, taking into consideration the "Core Principles for Deposit Insurance" that had been drafted by the International Association of Deposit Insurers (IADI) in spring 2008. The revision process, partly accelerated by fading public confidence vis-à-vis banks in a number of countries, had resulted in fundamental changes to various national arrangements. In this context, in line with the commitments made by the EU finance ministers on 7 October, the European Commission has recently initiated a revision of EU rules on deposit guarantee schemes, setting out a proposal to increase the minimum level of coverage for deposits from €20,000 to €50,000 with immediate effect, and to €100,000 within one year. In addition, it is planned to abandon the provisions for co-insurance that currently allow Member States to reimburse only 90% of frozen deposits within the scope of their national deposit guarantee schemes, and the suggestion has been put forward to reduce the reimbursement period from three months to three days. Moreover, the finance ministers agreed to take all the measures necessary to protect the deposits of individual savers, triggering political commitments by certain governments in Europe to provide unlimited coverage for depositors.

FUTURE PRIORITIES

Authorities around the world have launched a series of initiatives to address the weaknesses of the current regulatory and supervisory framework. The process of implementing the various recommendations and action plans is on track, and a number of concrete results have already been achieved. However, as the turbulence in various market segments continues to unfold and the impact on the real economy is gradually becoming apparent, both market participants and policy-makers have to face new types of challenges.

In this context, ensuring the consistency of the policy responses and identifying possible interactions between the various measures are of primary importance. Against this backdrop, authorities are making an effort, under the auspices of the FSF, to analyse these issues at the international level.

In addition, due consideration has to be given to systemic concerns, as well as to the possible impact of regulatory and supervisory measures on the overall economy when assessing options for policy responses. To that end, the FSF has launched an initiative to explore possible ways of mitigating the pro-cyclicality in the financial system that could have an adverse impact on the real economy as well. In this connection, four work streams have recently been set up to analyse the related regulatory challenges, stemming from the capital regime, loan-loss provisioning practices and compensation arrangements, as well as from valuation methods and leverage. As regards initiatives at the EU level, at its informal meeting on 12 and 13 September, the Ecofin Council also agreed to set up a working group to assess the range of policy responses that could reduce the potential pro-cyclical effects of the financial system.

Finally, looking further ahead, the reassessment of the scope of financial regulation is considered to be a priority by policy-makers. In this process, the FSF also intends to play a leading role, putting special emphasis on institutions, instruments and markets that are currently unregulated. In addition, the leaders of the G20 countries, who held an initial meeting in Washington on 15 November 2008, agreed on a comprehensive action plan to implement certain common principles for reform, including strengthening the regulatory regimes, prudential oversight and risk management, as well as ensuring that all financial markets, products and participants are regulated or subject to oversight, as appropriate to their circumstances. The finance ministers were requested to work to ensure that the immediate tasks and the medium-term actions defined by the action plan are fully and vigorously implemented, drawing on the ongoing work of relevant international bodies.

B RISK MANAGEMENT LESSONS OF THE FINANCIAL TURMOIL[1]

This special feature presents some observations on what were good risk management practices at large financial institutions, as well as the main lessons that could be learnt from the recent period of financial market distress and the recommendations that could be made from a risk management perspective.

INTRODUCTION

Over the past year and a half, the most severe financial shock recorded in decades has been witnessed. The end of the financial market turbulences is not yet in sight, with damage extending from the financial sector to the real economy. Practices at financial institutions have been at the centre of the chain of events that has now been termed "the credit crisis of 2007-08". In response to the major financial turbulences, supervisors, as well financial industry groups, have assessed the performance of the risk management functions at large financial institutions during this period of intense stress. This assessment has resulted in a number of reports, and first conclusions have been drawn by these expert groups on what has worked well in risk management. This is, of course, an aspect of great importance as the recent high-profile banking failures demonstrate. The downfall of large financial institutions can ultimately be attributed, in one way or another, to the failings of risk management. On the other hand, for those firms that have weathered the storm more or less unscathed, good risk management practices can be seen as the main variable explaining their good performance.

OBSERVATIONS ON GOOD RISK MANAGEMENT PRACTICES DURING THE RECENT TURBULENCES

So, what has worked well in risk management and what initial lessons can be learnt from the episodes of extreme financial distress in 2007 and 2008? Earlier in 2008, a group of financial supervisors from different countries provided a first assessment of, and response to, this question. The resulting document identified four areas in which banks that had performed well were particularly effective:[2]

Effective firm-wide communication

The report of the Senior Supervisors Group found that those firms that did well "generally shared quantitative and qualitative information more effectively across the organisation." This allowed the firms to anticipate potential problems in the markets for asset-backed securities (ABSs) well in advance, giving them the necessary time to implement plans to mitigate, reduce or completely shed risks while this was still possible and not overly expensive.

This firm-wide communication framework permitted senior management to implement macro-hedges when deemed necessary, as individual business units would otherwise have made decisions in isolation. In firms without this enterprise-wide framework, decisions taken at the level of business units increased, rather than reduced, the exposures at risk as the crisis developed. In other cases, awareness of the risks developing in some areas of the ABS markets was minimal or non-existent until it was too late.

Independent and rigorous valuation practices

Firms that performed well had established a disciplined approach for the valuation of complex or potentially illiquid securities. This implied a strong risk management culture, in which a critical and sceptical attitude existed to challenge the valuation input assumptions used by the front office. Independent assessments of the credit quality of assets backing complex securities were conducted to identify the intrinsic value of those securities. These valuation and credit assessment procedures were applied consistently across the firm. Valuation estimates were sometimes "tested" by selling a small

1 This special feature draws on discussions with risk management experts in various large international financial institutions, as well as on various reports produced by industry groups and financial supervisors.

2 See Senior Supervisors Group, "Observations on risk management practices during the recent market turbulence", March 2008.

proportion of illiquid assets to observe actual prices, or collateral disputes were monitored for clues to inconsistency with valuations provided by other dealers. These practices allowed those firms to have a better insight into both the true value of the securities and the implications of rating agency models and their results.

Effective management of funding liquidity, capital and the balance sheet

Better-performing firms had a closer alignment of treasury and risk management functions. These firms incorporated information from all business lines into a global liquidity planning concept that included actual and contingent liquidity risk. They had also created internal pricing mechanisms that provided incentives to charge business lines for building up contingent liquidity exposures so as to reflect the cost of obtaining liquidity in a deteriorating market environment. In addition, good firms "actively managed their contingent liquidity needs", by avoiding, for example, business lines such as structured investment vehicles or collateralised debt obligation warehousing, and these firms "exhibited greater discipline in adhering to limits in the face of changing market conditions".

Risk measurement and management reporting practices

Firms that managed to avoid major problems tended to have management information systems that were more adaptive and could rapidly incorporate altered assumptions as the market environment changed. Risk management in those firms relied on a wide range of measures of risk, sometimes including the levels and the growth of both net and gross notional amounts, and profits and loss dynamics, to provide several perspectives of a given exposure. Assumptions behind risk measures were updated frequently, and made transparent, so that they were more vigorously challenged. A blend of quantitative and qualitative assessments of risks was used to enable risk managers to swiftly revise their risk assessments in response to rapidly deteriorating conditions.

MAIN RECOMMENDATIONS FOR RISK MANAGEMENT IN FINANCIAL INSTITUTIONS

These initial observations by supervisors on what constituted successful risk management practices in the face of a very challenging financial environment provided financial market industry groups with the basis on which they could build a set of recommendations on best practices for risk management at financial institutions. Two reports stand out as particularly relevant in this regard: (i) the Counterparty Risk Management Policy Group report (CRMPG III) and (ii) the report of the Institute of International Finance.[3] These two reports, which were published in the summer of 2008, underscore the importance of good risk management practices as a precondition for containing systemic risks. Broadly speaking, three main areas of recommendations can be highlighted:

Governance and risk culture

It is recognised that an effective promotion of a consistent risk culture throughout the firm is the main enabling tool in risk management. Large financial institutions should examine their framework of corporate governance from time to time so as to ensure that it is fostering the incentives that will properly balance commercial performance and disciplined behaviour over the cycle. Good governance begins with the clear allocation of risk management responsibilities to senior management and, in particular, to the Chief Executive Officer (CEO) of the firm. It is the responsibility of the CEO and senior management to convey and develop a risk culture that covers all areas and activities of the firm, with accountability for risk management being a priority for the whole institution.

A key element of an effective risk culture is the communication of the firm's risk appetite, and ensuring its adoption throughout the firm. Firms should make sure that the risk appetite level is established by the highest level of management

3 See Counterparty Risk Management Policy Group, "Containing Systemic Risk: The Road to Reform. The Report of the CRMPG III", August 2008, and Institute of International Finance, "Final Report of the IIF Committee on Market Best Practices: Principles of Conduct and Best Practice Recommendations", July 2008.

and shared with the Board that is the ultimate overseer of the risk management function.

Another important element of a good corporate governance framework is the need to have a strong organisational structure for risk management. Firms should assign operational responsibility for risk management to a senior officer, the Chief Risk Officer (CRO), who should have sufficient seniority and independence from business line management. The CRO should have the ability and capacity to influence key decisions of the firm, with the objective of making sure that the level of risk taken by the firm is consistent with the agreed levels of risk appetite and that an integrated view of the overall risks faced by the firm is presented and discussed with senior management.

Institutions should ensure that their risk management functions are staffed appropriately in both good and bad times, with the capacity to work in periods of stress when spikes in processing large volumes occur and under various disaster recovery scenarios.

Large and complex financial institutions should, from a pragmatic point of view, rely on a number of high-level "institution-wide committees, to facilitate communication, coordination, and, in some instances, consensus-based decision making."[4] The CRMPG III report also stresses the importance of committee structures as a way to foster firm-wide cooperation and communication so as to help reduce the temptation of promoting a silo-mentality in isolated business lines that could bring down the entire firm in bad times.

Risk measurement and integration of risk management areas

Risk management should be implemented in a comprehensive, firm-wide fashion. The accurate measurement and monitoring of risks is essential, but it is, unfortunately, not enough to achieve a successful implementation of an effective risk management function. Ultimately, "good risk management and monitoring reduces to the basics of producing accurate information, at the right time, to the right people, such that those people can make the most informed decisions possible".[5] Therefore, robust communication channels should be put in place to allow the exchange of risk information between the Board, senior management and the various business lines, including the controlling function. Firms should be ready to invest adequately and on a sustained basis in their risk management teams and IT infrastructure and systems. A comprehensive, firm-wide risk management function also requires firms to develop an integrated firm view of all sources of risk, incorporating credit, market, liquidity and operational risk.

Very important is the need to have policies and procedures to identify and manage risk concentrations, aggregating risk exposures across the firm, regardless of whether they are contingent or non-contingent, on or off-balance-sheet, or contractual in nature. Firms should have the ability to rapidly compile aggregated counterparty information, incorporating exposures across all related legal entities on a global basis that reflects the effect of netting and collateral arrangements.

Risk management should not rely on a single risk methodology, taking into account the limitations of models and risk measurement techniques such as the value at risk (VaR).[6] In an environment like the financial markets, in which extreme price movements can be frequent, seemingly robust risk management tools can prove to be inadequate. With this in mind, firms should expand the range of risk metrics, moving beyond VaR as the dominant risk measure to include a range of stress tests, scenario analyses and other measures that could be useful in revealing portfolio risk characteristics, again taking into account the possible model drawbacks of these alternative risk measures. For example, it became clear that stress testing

4 See CRMPG III, op. cit.
5 See CRMPG III, op. cit.
6 See also Box 14 in ECB, *Financial Stability Review*, December 2007, and Box 13 in ECB, *Financial Stability Review*, June 2007.

as an additional risk metric used by the industry needed refinement, as evidenced by the large volume of losses at financial institutions during the market turbulences.

Valuation issues

Market conditions have made the valuation of many financial instruments very challenging during the recent market turmoil. As markets became less liquid, investors needed to resort to model-based valuation to price their positions, and to comply with fair valuation principles. However, the theoretical prices obtained from models turned out to be less reliable as the markets, from which key parameters for valuation had been derived, became more thinly traded and volatile. In this environment, pricing disagreements and collateral disputes increased, contributing substantially and materially to systemic risk. In general, but more specifically in this type of market context, it is important that firms "should ensure that they employ robust, consistent pricing policies and procedures, incorporating disciplined price verification for both proprietary and counterparty risk trades."[7] Theoretical or model-based valuations should be subject to sensitivity analysis with due consideration of the fact that market prices may become unreliable in periods of low liquidity. Firms should put in place an appropriate governance framework that ensures the independence of controls and a validation of valuations by the risk management function.

It has been also recommended that, whenever possible, firms should use transparent and liquid instruments, rather than bespoke products. To promote this practice, firms should consider imposing internal charges against profit and loss accounts for hard-to-value or illiquid transactions or other methods such as higher capital charges, limits or higher haircuts when the collateral received in a collateralised transaction has low market liquidity. In addition, firms should ensure, to the greatest extent possible, that whenever the same instrument is held by different business units, that instrument is marked at the same price. Different valuations for identical instruments could lead to inaccurate information being used for internal and external decision-making, and could possibly trigger legal and reputational issues that may have a financial impact.

CONCLUDING REMARKS

More than a year has passed since the start of major disruptions in the financial markets. Financial institutions have been at the centre of the turbulences. Despite various and repeated efforts to restore confidence and credibility in the financial industry, the situation in the banking system remains fragile. The risk management practices in some major financial institutions that led to the recent turmoil are an important contributing factor. This special feature summarises what has worked well in risk management and what the first lessons are that can be learnt from the experience gained over the past year and a half.

It is important in these closing remarks to emphasise the importance of senior managers in promoting a corporate governance framework in which risk management can operate effectively. Senior managers are the ultimate guarantors for an adequate risk culture to permeate into all parts of the institution. They should be directly involved in risk management decision-making so as to ensure that the institution's agreed risk tolerance is respected and maintained. This is important as, far too often, senior managers at large financial institutions did not heed the advice of risk managers prior to the start of the crisis. It is therefore not surprising that those firms that did relatively well were run by executives that were directly involved in risk management and, therefore, had direct knowledge of the market issues that were developing.

7 See CRMPG III, op. cit.

C DELEVERAGING AND RESILIENCE AMONG LARGE AND COMPLEX BANKING GROUPS IN THE EURO AREA

This special feature attempts to evaluate the resilience of lending by euro area large and complex banking groups to the financial turmoil, using recent quarterly balance sheet data. The analysis suggests that loans to customers will decline in the coming quarters. While a further drop in the value of assets in the financial sector would accentuate and prolong this process of deleveraging until the end of 2009, efforts to raise bank capital would help mitigate the expected decline in customer loan growth.

INTRODUCTION

The tensions in global credit markets in recent months, which led to significant disruptions in banks' wholesale funding and to write-downs of major banks' trading book assets, have seriously tested the resilience of euro area banks. The heightened difficulties in raising funds in the wholesale and securitisation markets and the mounting pressure on banks' capital positions may, in turn, adversely affect banks' ability to extend loans. This could be the case, in particular, for those banks that have expanded their lending more aggressively in the past years, often funding that lending via non-deposit sources.

Using data from the quarterly financial reports of 11 large and complex banking groups (LCBGs) in the euro area, this special feature examines the relationship between two basic indicators of bank resilience (measured by the customer deposit-to-loan ratio and the Tier 1 capital ratio) and the growth of lending over the past three years.[1] The main underlying idea is that those banks that have, in recent years, leveraged themselves up most aggressively in the sense of expanding their lending primarily by relying on wholesale funding and tightening their capital positions are most vulnerable to liquidity and solvency risks, and are also most likely to cut back on lending in the period ahead. Hence, on the basis of bank-level quarterly data, the present analysis aims to detect the potential and scope for balance sheet retrenchment (or de-leveraging) among the large euro area banks, which could amplify the projected downturn in lending to the non-financial private sector over the coming quarters.

INDICATORS OF BANK RESILIENCE

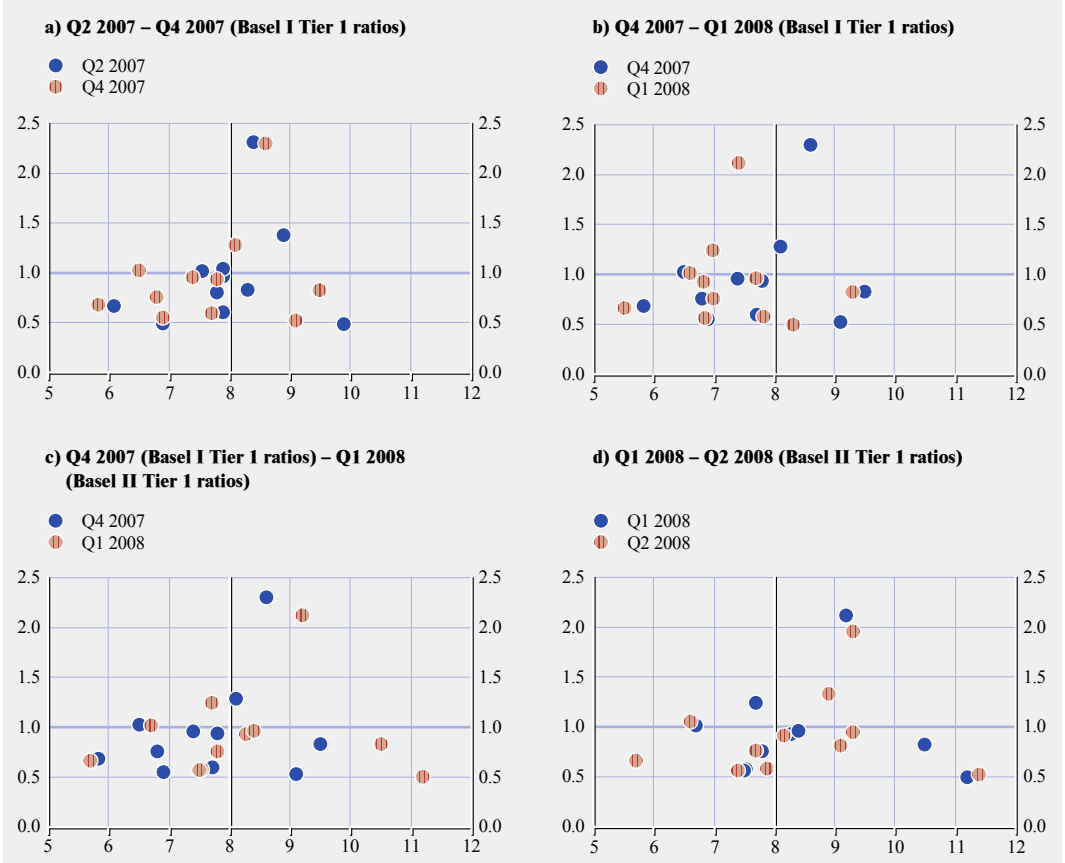
Against this background, Chart C.1, panels a-d, presents the distributions of banks across two measures of bank resilience between the second quarter of 2007 and the second quarter of 2008. On the one hand, the ratio of customer deposits to customer loans (y-axis), which is also referred to as the "deposit gap", provides an indication of the bank's external financing capacity. It measures the degree to which the bank structurally relies on non-core deposits to finance its retail lending, or – in other words – the bank's sensitivity to refinancing risk and disruptions in the wholesale funding market. The events that have hit the global credit markets over the past few years clearly illustrate that wholesale funding risk is an important parameter in assessing the supply-side lending position of banks. On the other hand, the Tier 1 capital-adequacy ratio (x-axis), which has been determined by regulation, reflects the pressure that the adverse effects of last year's write-downs (and losses) have put on a bank's profitability and capital position.[2]

In the second quarter of 2007 (i.e. immediately before the turmoil broke out), all banks in the sample had capital ratios well above the regulatory minimum of 4% – and also above the lower limit of 6% for classification as a "well-capitalised" bank (as defined by US federal regulatory agencies). The dispersion in terms of capital positions, however, was quite wide, with seven banks displaying Tier 1 ratios

1 These 11 banks are those that issued quarterly interim financial reports for a sufficiently long period up until the second quarter of 2008. Total loans to euro area residents by the 11 banks in the sample account for around 20-25% of the total loans granted by euro area MFIs to the private sector in the euro area.

2 According to Bloomberg data, by late November 2008, euro area LCBGs had incurred about USD 90 billion in losses/write-downs since early 2007, while they had raised new capital of USD 125 billion over the same period.

Chart C.1 Euro area large and complex banking groups' deposit-to-loan and Tier 1 ratios



Sources: Banks' quarterly financial reports and ECB calculations.
Note: The charts show the distribution of Tier 1 ratios and customer deposit-to-customer loan ratios across 11 large euro area banks. Panels a and b show Tier 1 ratios as calculated under Basel I rules. For Q1 2008, the Tier 1 ratio corresponds either to the Basel I definition when they were disclosed by the banks, or to proxies of the Basel I definition. These proxies are the updates of the Basel I Tier 1 ratio of Q4 2007 using the growth rates of the Tier 1 capital to total assets ratio between Q4 2007 and Q1 2008. Panel c reports the Basel II Tier 1 ratios for Q4 2007 and the Basel II Tier 1 ratios for Q1 2008. Panel d reports the Basel II Tier 1 ratios as disclosed by the banks in their financial reports.

below 8%. With respect to reliance on wholesale funding, most banks had a deposit-to-loan ratio below unity. In fact, only two banks had a deposit-to-loan ratio significantly above unity. On average, banks financed 15% of their credit supply through wholesale markets and, if one outlier is excluded, this proportion goes up to 30%. This may point to a widespread potential vulnerability of large banks to disruptions in the wholesale funding market.

The comparison of these indicators before and after the turmoil broke out (see Chart C.1, panel a) yields two main conclusions. First, the banks' capital positions tightened for most of the banks in the second half of 2007, especially for those banks with a capital ratio that was below the 8% threshold before the turmoil (visually, the banks moved to the left). Second, the turmoil did not hit all banks in the same way and increased heterogeneity in the banking system, with some banks apparently being more resilient than others. The main reason for the deterioration of banks' balance sheets was presumably the negative effects of write-downs (fair-value adjustments) of banks' tradable credit

portfolios, warehousing costs, liquidity back-up lines for special-purpose vehicles (SPVs) and the disappearance of income flows stemming from underwriting activities in the secondary loan and securitisation markets. In terms of the deposit gap, the distribution remained more or less unchanged, which is not surprising given the more structural nature of this indicator (changes in banks' funding structures tend to take place only gradually over time).

Chart C.1, panels b-d, show the latest evolution of the indicators of bank resilience, four quarters into the turmoil. This comparison is delicate in view of the change in reported capital requirements from Basel I to Basel II in the first quarter of 2008. Chart C.1, panel c, shows that Tier 1 capital ratios increased for eight of the 11 banks of the sample from the fourth quarter 2007 to the first quarter of 2008. The comparison of Chart C.1, panel b, with Chart C.1, panel c, indicates that, for most of the banks, this evolution is imputable to the transition to capital requirements based on Basel II. The latter resulted in a decline in risk-weighted assets and, all other things being equal, thus in a relaxation of the capital requirements. Taken at face value, Basel II may therefore have somewhat eased the pressure on banks to deleverage. On the other hand, however, discounting this change in regulatory capital requirements yields a different picture, with a further deterioration of Basel I Tier 1 ratios for most of the banks (Chart C.1, panel b).[3] Chart C.1, panel d, shows that Tier 1 ratios continued to decrease in the second quarter of this year. In this context, how should one expect the recent evolution of banks' financial situation to affect retail lending?

BANK DELEVERAGING

To answer this question, a loan growth model was first estimated on the basis of the two resilience ratios (the deposit-to-loan ratio and the Tier 1 capital ratio) and then simulated to obtain a forecast of retail lending growth up to the first quarter of 2009.

Table C.1 Euro area large and complex banking groups' loan growth regression

Dep. Variable: QoQ loan growth (i,t)	
Constant	0.27
	11.57
QoQ loan growth (i,t-1)	-0.25
	0.14
YoY GDP growth (t-1)	0.45
	1.76
Tier 1 ratio (i,t-2)	2.62**
	0.87
Tier 1 ratio (i,t-3)	0.53**
	0.20
Loan to deposit ratio (i,t-3)	-0.14*
	0.06
N	79
R2	0.32

Sources: Banks' quarterly financial reports and ECB calculations.
Note: The table shows the estimates of a standard loan growth equation estimated on the basis of a panel of 11 large banks over the period Q4 2005 – Q2 2008, using OLS. The model includes bank-specific fixed effects. The Tier 1 ratio is corrected for the change in regulatory capital requirements after Q1 2008. Robust standards errors are reported in italics.
* and ** refer to statistical significants at the 5% and 1% thresholds respectively.

The sample is a quarterly panel of 11 LCBGs over the period from the fourth quarter of 2005 to the second quarter of 2008. Both resilience indicators have statistically significant effects with the expected signs (see Table C.1). Loans from well-capitalised banks increase faster than loans from other banks, and an increase of 1 percentage point in the Tier 1 ratio, for example, would yield a total increase of 3.15% in the credit supply after three quarters. Reliance on wholesale finance, too, seems to be an important determinant of the loan supply. An increase of 1 percentage point in the loan-to-deposit ratio (i.e. a higher funding gap) would imply a reduction of 0.14 percentage point in loan growth after three quarters. As control variables, the model also includes bank-specific fixed effects, the lagged quarter-on-quarter loan growth, and the lagged year-on-year euro

3 Although EU banks now have to comply with Basel II capital requirements, also considering measures based on Basel I is still relevant. The reason is that, in the transition period 2007-09, "regulatory floors" are imposed (and may be binding in some cases) in the sense that banks' risk-weighted assets are not allowed to fall below a certain threshold in comparison with the level based on Basel I.

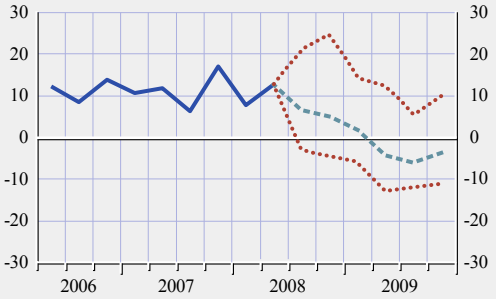
area real GDP growth. The negative effect of lagged loan growth is somewhat unusual but not statistically significant. The lagged year-on-year GDP growth aims at controlling for the effects of demand-side factors on loan growth. As expected, it enters the model with a positive sign, although it is not significant either.

In a second step of the analysis, the estimates reported in Table C.1 were used to forecast the growth rates of retail lending by euro area LCBGs. Since the Tier 1 capital and loan-to-deposit ratios could not, as yet, be observed over the forecasting horizon, the loan growth model was complemented with two bridge equations to forecast these two variables. These two equations take the form of an order-three auto-regressive model augmented with the lagged nominal three-month Euribor and the real euro area GDP growth rate. These two factors capture the effects of macroeconomic developments on the credit supply and, thereby, potential bank lending channel effects. The bridge equations do not incorporate the measures taken by banks and governments to replenish bank capital in the recent months. The whole model was simulated to obtain, for each bank, forecasts of loan growth. The simulations are based on the October 2008 Consensus Economics' forecast for GDP growth over the forecasting horizon, and on the assumption of a steady decline in the three-month EURIBOR from the third quarter of 2008 until the third quarter of 2009. The latter assumption is in line with the interest rate path underlying the Eurosystem staff macroeconomic projections of December 2008. Chart C.2 summarises the results of these baseline simulations at the aggregate level.

Customer loan growth is expected to slow down until the first quarter of next year, and to deteriorate further in the second and third quarters, before slowly recovering in the fourth quarter. The negative credit growth in the second and third quarters of 2009 can be explained by the second-round effects of developments in the real sector on the financial sector. It reflects the impact of the deceleration in GDP growth (down to 0.2% in the first quarter of 2009, as forecasted by Consensus Economics), not only on credit demand (direct effect in the model), but also on the credit supply, through the deterioration of banks balance sheets and, in particular, the Tier 1 ratios. One would expect this general deleveraging movement to come primarily from those banks that rely the most on wholesale finance and that had a Tier 1 capital ratio which remained low in the first half of this year. The forecasted loan growth varies widely across banks, with some banks even displaying a fall in customer loan growth by more than 10% in the second quarter of 2009.

Chart C.2 Loan growth forecast for euro area large and complex banking groups – baseline scenario

(annualised figures)



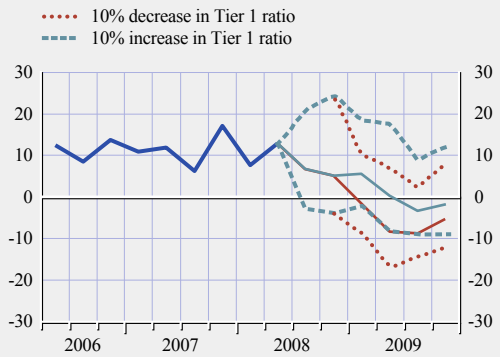
Sources: Banks' quarterly financial reports and ECB calculations.
Notes: The dashed line corresponds to the average forecast of annualised quarterly growth rates of loans and the dotted lines correspond, for each point in time, to the extreme point forecasts among the 11 banks in the sample. To obtain this forecast, the model in Table C.1 was first simulated for each bank, the implied quarterly growth rates were weighted averaged using banks' market shares as weights, and finally multiplied by 4 to obtain annual values. The Tier 1 and loan-to-deposit ratios used in the model are updated using AR(3) models as bridge equations. These bridge equations also include the lagged three-month nominal Euribor and euro area real GDP growth.

SENSITIVITY ANALYSIS

In the baseline scenario presented above, a bank's Tier 1 capital ratio is assumed to depend only on its own auto-regressive dynamics and on the forecasts of future GDP growth and interest rates. This scenario does not feature any further depreciation of assets, nor any unexpected decrease in banks' Tier 1 capital ratios over the forecasting horizon.

Chart C.3 Loan growth forecast for euro area large and complex banking groups – scenarios based on a decrease or an increase of 10% in the Tier 1 capital ratios

(annualised figures)



Sources: Banks' quarterly financial reports and ECB calculations.
Note: The solid lines correspond to the average forecasts of annualised quarterly growth rates of loans. The figures are computed the same way as in Chart C.2, except that the simulations are made assuming either two successive additional unexpected declines of 5% in the Tier 1 ratio in Q3 2008 and Q4 2008 (pessimistic scenario: red lines), or two successive additional unexpected increases of 5% in the Tier 1 ratio in Q3 2008 and Q4 2008 (optimistic scenario: green lines).

To analyse the sensitivity of loan growth to turmoil-related effects over the coming quarters, the simulation exercise was replicated assuming one pessimistic and one optimistic scenario. The pessimistic scenario features two additional exogenous 5% decreases in banks' Tier 1 capital ratios in both the third and the fourth quarter of 2008. Under this scenario, the loan-growth slowdown is more pronounced (and prolonged) over the next two years. The optimistic scenario, by contrast, features two additional exogenous 5% increases in banks' Tier 1 capital ratios in both the third and the fourth quarter of 2008. Under this scenario, customer loan growth remains negative in the second half of next year, but the slowdown is less pronounced.

CONCLUDING REMARKS

This special feature attempts to evaluate the resilience of large euro area banking groups in the current environment of financial turmoil. This resilience is important to assess the potential effects of the financial turmoil on bank lending to the non-financial sector. The analysis suggests that, owing to the ongoing pressure on banks' solvency positions and their restrained ability to refinance, euro area banks are likely to enhance their efforts to deleverage, which would be expected, in turn, to lead to more moderate credit growth over the coming quarters. At the same time, the analysis underlines the potential positive effects of the ongoing efforts to replenish banks' capital buffers.

D LIQUIDITY RISK PREMIA IN MONEY MARKET SPREADS

Unsecured interbank money market rates such as the EURIBOR increased strongly with the start of the financial market turbulences in August 2007. There is clear evidence that these rates reached levels that cannot be explained solely by higher credit risk premia charged by lenders in interbank transactions. This special feature presents this evidence and provides an explanation which draws on the funding liquidity risk of lenders in unsecured money markets.

INTRODUCTION

The start of the financial market turbulence in August 2007 was marked by a strong increase in interest rates on unsecured interbank loans with maturities beyond one day (term loans). Within a few days, for example, the spread between the 12-month EURIBOR and the 12-month EUREPO rose from about 10 basis points to over 60 basis points and has remained at elevated levels since then.[1] The three-month and six-month EURIBOR followed a similar pattern (see Chart D.1).[2]

A straightforward explanation of these wider spreads draws on the notion of higher credit risk premia. The credit risk premium is the component of an interest rate that the lender demands as compensation for the risk that the borrower may default. Indeed, the perceived risk of default of the borrower in an interbank loan transaction, measured by spreads of credit default swaps (CDSs), also increased with the start of the turbulence.

However, there is clear evidence that higher credit risk premia alone cannot explain the current interbank money market spreads. If such spreads mainly reflected the credit risk of lenders, approximate no-arbitrage conditions would require that they be close to the spreads on bank CDS spreads. But, since August 2007, money market spreads have been much wider.

This special feature summarises the empirical evidence for the existence of a liquidity risk premium in current money market spreads and suggests that funding liquidity risk is the main driver of this premium.[3] Moreover, it indicates that the liquidity risk premium can be interpreted as an indicator of two important aspects of financial stability issues which are difficult to measure by other means: the risk of significant liquidity shocks; and the non-availability of assets that can be used as collateral to raise funds in repo markets.

Chart D.1 EURIBOR-EUREPO spreads

Sources: Bloomberg and EUREPO.

DECOMPOSING MONEY MARKET SPREADS

In order to decompose money market spreads into a credit risk premium and a residual component, which may be called the funding liquidity risk premium, money market spreads are compared with CDS

1 The EURIBOR is defined as the rate at which euro interbank term deposits within the euro area are offered by one prime bank to another prime bank. The EURIBOR is calculated as an average of rates reported daily by a set of major banks. The EUREPO is defined as the rate at which one prime bank offers funds in euro to another prime bank if, in exchange, the former receives from the latter general collateral from a basket of (high quality) assets.

2 EURIBOR spreads are measured throughout this special feature as spreads over repo rates. Alternatively, EONIA swap rates could be used as a benchmark. However, the results would be broadly the same.

3 The analysis is based on J. Eisenschmidt and J. Tapking, "Liquidity risk premia in unsecured interbank money markets", *ECB Working Paper*, forthcoming.

spreads. There are various ways to do this. The methodology followed here is based on arbitrage considerations.[4]

A single-name CDS contract between two parties – a protection buyer and a protection seller – is essentially a form of insurance against a default of the issuer (the "reference entity") of a bond (the "reference obligation"). It is characterised by a notional amount q, the CDS spread ρ and a maturity. The protection buyer pays a quarterly premium $(1/4)\rho q$ to the protection seller until the CDS contract matures or the reference entity defaults on the reference obligation, whichever occurs earlier.[5] The protection seller pays the notional value of the contract less the market value of the reference obligation (with a nominal value q) if default occurs before the CDS matures.

It is well-established that, in the absence of liquidity problems, the CDS spread should be approximately equal to the difference between (i) the yield of a par bond issued by the reference entity that matures when the CDS matures and (ii) the risk-free rate, e.g. the repo rate.[6] If this is not the case, then arbitrage opportunities may arise. Profits can be realised, for example, if the bond spread exceeds the CDS spread. In such circumstances, investors would raise funds at the repo rate (provided that they have sufficient collateral), buy the par bond with these funds and buy protection by means of a CDS. Investors with a cash surplus would buy the bond and protection by means of a CDS, rather than invest the surplus at the risk-free rate.

Similarly, investors could make arbitrage profits if the spread between the interest rate on a one-year unsecured interbank loan to bank *B* over the one-year repo rate were to exceed the spread of a CDS on bank *B* (the reference entity). Banks realise profits if they raise funds at the repo rate, lend unsecured funds to bank *B* and buy protection by means of a CDS on bank *B*. Banks with a surplus would lend unsecured funds to bank *B* and buy protection rather than invest the surplus at the risk-free rate.[7]

This argument establishes a relationship between the spread of a one-year CDS on bank *B* and the spread of the interest rate at which bank *B* borrows unsecured funds for one year in the interbank market. However, information on bank-specific interbank rates is not available, so that the one-year EURIBOR is used for the present analysis. The one-year EURIBOR can be considered to be a lower bound to any bank-specific interbank rate. To understand why, it is important to know how the EURIBOR is defined.

The EURIBOR is calculated as the average of 43 rates, each reported by one of the EURIBOR panel banks. The panel banks report rates "to the best of their knowledge … rates being defined as the rates at which euro interbank term deposits are being offered within the EMU zone by one prime bank to another … ('the best price between the best banks')."[8] Thus, panel banks report rates at which they believe one of the best banks offers unsecured loans with the maturity in question to another of the best banks.

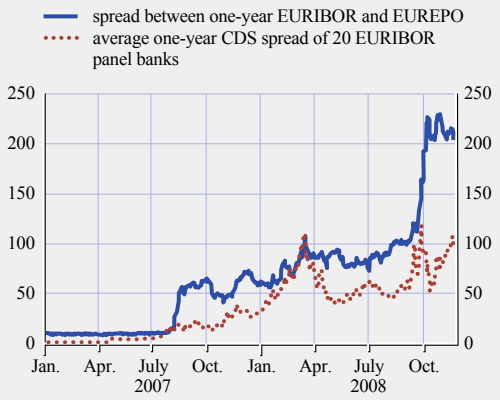
Assuming that "prime banks" are the "best banks" in the sense that they are offered relatively low rates when they borrow unsecured funds, the EURIBOR could be considered to be a lower bound. A specific bank would not normally be offered loans at rates significantly below the EURIBOR. Arbitrage opportunities should thus arise in the absence of liquidity problems if the one-year CDS spread on a given bank were below the spread of the one-year EURIBOR over the one-year repo rate.

Chart D.2 shows the spread of the one-year EURIBOR over the one-year EUREPO and the average spread of one-year CDS contracts on

4 See Box 10 in ECB, *Financial Stability Review*, June 2008 for an approach that is based on regression techniques.
5 It also applies if any other "credit event" as specified in the CDS contract occurs.
6 See for example D. Duffie, "Credit Swap Valuation", *Financial Analysts Journal*, January/February 1999.
7 The arbitrage argument is based on a number of assumptions: for example, that the recovery rate of default is the same for bonds of, and interbank loans to, the reference entity.
8 Quoted from the EURIBOR Code of Conduct, see www.euribor.org.

Chart D.2 EURIBOR spreads versus spreads of CDSs on EURIBOR panel banks

(basis points)



Sources: Bloomberg and EUREPO.

20 EURIBOR panel banks. Before the start of the turmoil, the difference between these two spreads was less than 8 basis points. However, right at the very beginning of the turmoil, this difference rose to more than 40 basis points. It remained high, except at the peak of the Bear Stearns crisis in March 2008. Based on the above argument, it could thus be concluded that the high EURIBOR spreads seem to offer arbitrage opportunities.[9]

It is notable that the EONIA, i.e. the average rate on unsecured overnight euro deposits, has not increased relative to the ECB minimum bid rate (see Chart D.3).

Chart D.3 Spread of the EONIA over the ECB minimum bid rate

(basis points)

Source: ECB.

In contrast to term money market spreads, this EONIA spread even decreased slightly (from about 6 basis points to less than 1 basis point), on average at the start of the turbulences, although it subsequently became more volatile.

TOWARDS AN EXPLANATION OF ELEVATED EURIBOR SPREADS

Why do EURIBOR spreads persist at levels that seem to offer arbitrage opportunities? One possible explanation draws on the funding liquidity risk borne by the lender in an unsecured interbank transaction.

Consider a bank with a liquidity surplus. It could offer one-year unsecured loans in the interbank market. However, it could be hit by a liquidity shock (outflow of liquidity) before such loans mature. The resulting liquidity deficit would force the bank to raise funds. This may be costly or even difficult.

If the bank considers the probability of a significant liquidity shock within one year to be negligible, it might be willing to lend unsecured funds for one year at a rate that compensates only for the risk that the borrower may default. This rate would equal the risk-free one-year rate plus a spread close to that of a one-year CDS on the borrowing bank.

The same may be true (at least in the absence of interest rate risks) if the bank assumes, on the one hand, that a liquidity shock is likely, but believes, on the other hand, that it would be able to borrow funds at a rate close to the risk-free rate if a liquidity shock were to materialise. It would be able to do so if other banks perceive its probability of default as being very low, or if the bank expects to have sufficient high-quality collateral to enable it to borrow in the repo market.

9 It is assumed here that there is no counterparty risk in CDS contracts, so that CDS spreads only reflect the probability of a credit event (and the recovery rate of default of the reference entity). Indeed, as CDS contracts are typically collateralised, the risk that the protection seller may default on its obligations appears to be low.

However, the situation changes if three conditions, which together define the bank's funding liquidity risk, are fulfilled:

- The probability of a significant liquidity shock within one year is not negligible.
- The default probability of the bank at the time of such a liquidity shock is not negligible.
- The probability of a shortage of high quality collateral available to the bank at the time of a liquidity shock is not negligible.

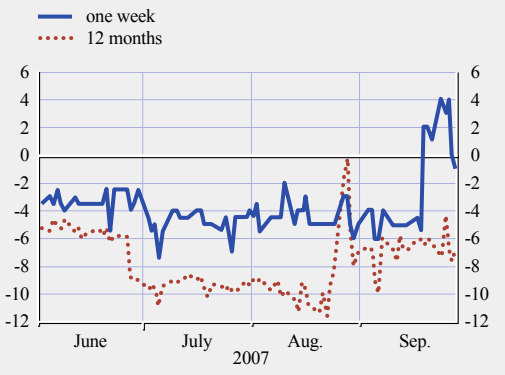
If these conditions are fulfilled, then the bank must take into account the possibility that it may need to refinance any one-year loan granted in the unsecured interbank market at a high cost. As a result, the bank will only be prepared to lend unsecured funds for one year at a rate that also compensates for its funding liquidity risk. It should be noted that, due to the funding liquidity risk, the bank cannot engage in arbitrage even if it could lend unsecured funds at spreads above those of CDS contracts on borrowing banks.

As an alternative to granting a one-year loan, the bank could repeatedly offer overnight unsecured loans in the interbank market. Every day, the bank's money would be repaid to it (plus interest) and it could offer a new overnight loan. If the bank were hit by a liquidity shock, it would use the repayment S of the loan granted on the previous day to offset its liquidity deficit D. If S were smaller than D, it would need to raise only D-S and would not offer a new loan. Thus, funding liquidity risk no longer plays a significant role, so that the bank can offer overnight loans at rates that do not include a liquidity risk premium.[10]

This suggests that banks with a cash surplus will, in times of funding liquidity problems, offer unsecured term loans at elevated rates, while overnight loans may be offered at relatively low rates. This is consistent with the evidence provided in the previous section.[11]

Chart D.4 Spread of EUREPO rates over EONIA swap rates

(basis points)



Source: ECB.

It should be noted that this reasoning applies only to the unsecured interbank market, and not to repo markets. If a bank grants a general collateral repo loan for a longer term, then, for the life of the loan, it receives in exchange assets eligible to be used as collateral in repo markets. It can reuse this collateral to raise funds itself in the repo market at the low repo rate if it is hit by a liquidity shock before the loan matures. Funding liquidity risk may therefore play a subordinate role in general collateral repo markets. This is in line with the observation that the difference between short-term and long-term repo spreads against overnight index swaps (which was small before the turmoil) did not increase at the start of the turbulences (see Chart D.4).

FINANCIAL STABILITY CONSIDERATIONS

While probabilities of default can be measured directly by means of CDS spreads, it is very difficult to measure directly (i) the probability (and magnitude) of future liquidity shocks and

10 Funding liquidity risk in overnight transactions may still play a minor role since such transactions may be concluded in the morning, so that the lender faces the risk of a liquidity shock in the afternoon.

11 Another major reason for low EONIA levels (in addition to the low funding liquidity risk in overnight transactions) is doubtless the liquidity policy of the Eurosystem that aims to keep the EONIA close to the Eurosystem's main refinancing rate.

(ii) the expected availability of high-quality collateral. The analysis presented here suggests that the difference between unsecured money market spreads and CDS spreads may be used as an indicator to this end. Given the significance of liquidity shocks and collateral for financial stability, this indicator is important for financial stability analysis.

At the present juncture, the analysis suggests that the probability that individual banks – including banks that currently have a liquidity surplus – will be hit by significant future liquidity shocks and, at the same time, face a shortage of high-quality collateral has reached exceptionally high levels (see the difference between the EURIBOR-EUREPO spread and the CDS spread as shown in Chart D.2).

This view is also supported by a number of other observations.

First, banks with an exposure to certain types of special purpose entities, such as special investment vehicles (SIVs) have, since the start of the turmoil, faced a higher risk of having to support such entities. An SIV is typically set up by a bank for the purpose of raising short-term funds and investing them, in particular, in longer-term asset-backed securities (ABSs). Since the start of the US sub-prime crisis, investors have feared that ABSs could underperform and they are therefore more reluctant to renew short-term loans to SIVs. As a consequence, the risk that a bank will need to support an SIV – i.e. provide liquidity to the SIV in exchange for ABSs – has increased. As ABSs are not normally accepted as collateral in repo markets, financially supporting an SIV could imply a significant liquidity shock and a simultaneous deterioration of the quality of available collateral.

Second, fewer asset types are reportedly being accepted as collateral in repo markets than was the case prior to the turmoil. This applies, in particular, to structured assets such as ABSs.

Third, since the start of the turmoil, Eurosystem counterparties have, on average, used as collateral in operations with the Eurosystem far fewer assets than are accepted in repo markets. This indicates that counterparties reserve these assets for repo transactions.[12]

Finally, there is also some evidence that counterparties who mainly use ABSs as collateral in operations with the Eurosystem submit on average higher bid rates at Eurosystem refinancing operations than those who mainly use assets that are also accepted in repo markets. These bid rates have reached levels far above repo rates. One possible explanation is that many banks that mainly use ABSs in operations with the Eurosystem expect to or have already run short of collateral accepted in repo markets. If they are unable to raise funds in Eurosystem operations, they will need to borrow unsecured funds at even higher rates.

It is important to note in this context that there is no risk of an aggregate liquidity shortage, since it is the policy of the Eurosystem to ensure that the banking sector has enough liquidity in aggregate terms. Nor are there any indications that the banking sector has, on aggregate, a shortage of collateral accepted in repo markets. This may be due in no small measure to the collateral policy of the Eurosystem, since it accepts a wide range of assets as collateral. Therefore, the Eurosystem has not absorbed assets that could otherwise have been used in repo markets.

CONCLUDING REMARKS

Spreads of unsecured interbank term money market rates have revealed significant liquidity risk premia. It can be argued that these premia reflect the funding liquidity risk of lenders in interbank transactions. The funding liquidity risk in this context is (i) the risk that the lender

12 These assets are mainly central government bonds. Besides these bonds, the Eurosystem accepts several other asset types as collateral, such as corporate bonds, covered and uncovered bank bonds, ABSs and certain non-marketable assets. For a discussion of the use of assets in repo markets and in central bank operations, see C. Ewerhart and J. Tapking, "Repo markets, counterparty risk and the 2007/2008 liquidity crisis", *ECB Working Paper,* No 909, June 2008.

will be hit by a liquidity shock before the loan matures; (ii) the lender will only be able to raise funds at the time of the shock at relatively high rates because of a lack of high-quality collateral (so that funds cannot be raised in the repo market); and (iii) market perceptions that there is a non-negligible probability that the lender will default.

Against this background, the liquidity risk premium in interbank money market rates can be interpreted as an indicator of the risk that individual banks with a lack of high-quality collateral will be hit by a significant liquidity shock.

E SECURITISATION IN THE EURO AREA

Securitisation has become an increasingly important element of structured finance and has seen rapid development in recent years. In light of the tumultuous events in financial markets since August 2007, however, the securitisation process has come under increasing scrutiny. This special feature explores the securitisation process from a supply-side perspective, highlighting the benefits and drawbacks of this approach. An overview of developments in the market, in the context of the recent turbulence, is also provided. A new source of data on securitisation is then introduced and results on emerging trends in the market are highlighted.

INTRODUCTION

The process of securitisation involves the transformation of illiquid financial assets into liquid, tradable securities, thereby widening participation in the capital markets and allowing risk to be transferred to those willing to bear it. Securitisation has seen rapid development in recent years. It has, however, been identified as a source of the current financial turmoil, and while the ultimate causes of the current turbulence are far deeper than the securitisation of sub-prime assets, the latter has certainly been a catalyst.

Securitisation facilitates the transfer of risk from originators to other participants in structured credit markets.[1] The transfer of credit risk has several implications. Regulatory capital arbitrage is an important motive for securitising assets, which is especially relevant for assets of higher quality, given that under Basel I capital charges for higher-rated assets are higher than for securitised assets. Furthermore, the liquidity facilities offered by originators to special-purpose vehicles are not subject to Basel I capital charges, thereby providing banks with the possibility of extending new loans. Securitisation also allows non-liquid assets to be converted to cash relatively quickly and inexpensively. Another important advantage of securitisation is the absence of credit risk for the originator of the securitised assets, as the financial vehicle corporation (FVC) used to issue the securities is completely separated (and thus bankruptcy-remote) from the sponsoring bank. As a consequence, investors only have exposure to the securitised assets and are not impacted by risks emerging from other activities. This bankruptcy-remoteness reduces the FVC's cost of funding. The process also offers benefits to investors. By transferring risk, investors can assume exposures that may otherwise be unavailable, a possibility that is useful for diversifying asset portfolios. Asset and liability characteristics of FVCs can be tailored to the needs of originators. An additional advantage for investors in buying asset-backed securities (ABSs) is that these assets are classified as eligible collateral for open market operations and can easily be made liquid. Securitisation may also fulfil a valuable price discovery function – provided that there is transparency concerning the securitised assets and that they are traded in liquid markets – as illiquid assets are transformed into well-priced tradable assets, enhancing the efficient allocation of capital in the financial system. If there is enough transparency concerning risk, securitisation can facilitate a redistribution of that risk within the financial sector. As banks have greater possibilities to tailor the risk profiles of their balance sheets, financial stability can, in theory, be enhanced.

However, the interaction of supervision and accounting regulations with growing financial sophistication and the increasingly pivotal role of rating agencies has magnified some of the negative aspects of the model of securitisation, namely a spurious transfer of credit risk, a lack of transparency in the credit quality of securities

1 A full discussion of the benefits and drawbacks of the securitisation process, the originate-to-distribute model and the role of special-purpose vehicles is beyond the scope of this special feature; see instead ECB, "Credit risk transfer by EU banks: activities, risks and risk management", May 2004, ECB, "Securitisation, bank risk-taking and loan supply in the euro area", *Financial Stability Review*, June 2008, ECB, "Securitisation in the euro area", *Monthly Bulletin*, February 2008, and D. Marqués Ibañez and M. Scheicher, "Securitisation: instruments and implications," in A. Berger (ed.), *Handbook of Banking*, Oxford University Press, Oxford, forthcoming.

and an unreliable evaluation through models or the secondary market. The ultimate causes of these problems can be traced to the weaknesses which are inherent in the model and result from asymmetric information and a misalignment of incentives.

On account of the benefits of the model, however, the market for ABSs grew rapidly in the past few years and its size became very significant in comparison with other fixed income markets. In the United States, the total amount outstanding of structured products is estimated to stand above USD 9.7 trillion. By comparison, the size of the Treasury market is USD 4.5 trillion. In Europe, the size of the ABS market is believed to be €1.3 trillion, compared with the €4.8 trillion outstanding in euro-denominated government bonds.

That rapid growth, however, led to an increase in the vulnerabilities in the financial system. The short-term nature of financing through this market represented a risk, particularly through active maturity transformation, where illiquid long-term assets are funded through the sale of short-term securities. Such concerns may be heightened during the late stages of the economic cycle, when credit risk may increase, or when banks may have overextended themselves in their (direct or indirect) exposure to short-term securities. It is now clear that by August 2007, these risks had become acute against the background of abundant liquidity, low interest rates, exceptionally low and persistent financial market volatility and the widely held belief that risk had been under-priced for some time.

Latterly, the continued rapid growth in the volume of outstanding short-term securities in both Europe and the United States has coincided with monetary policy tightening cycles. In the United States, after a long period of unusually low interest rates – bottoming for almost a year at 1% from mid-2003 – rates were raised in 17 steps to 5.25%. In the euro area, after more than two-and-a-half years of historically low interest rates, at just 2%, rates were raised in eight consecutive steps to 4% in little more than a year. It can be argued that these tightening cycles increased the cost of funding through short-term securities, putting further stress on underlying long-term assets financed through that medium. In addition to maturity transformation, which was a primary source of risk, a second source of vulnerability was the rising cost of funding along the curve.

During the summer of 2007, the short-term security market was impacted significantly by the sharp reduction of outstanding amounts in the United States. The peak coincided with the start of the turmoil in August 2007, as the maturing securities could not be rolled over. The start of the market turmoil centred on the issue of ABSs, credit concerns and increases in banks' liquidity needs. The three dimensions of the emerging crisis were closely correlated, which remains the case. The lack of financing through short-term securities created a financing gap as the underlying long-term assets previously funded by short-term securities still needed to be financed. This gap exerted pressure on the FVCs, some of which had to deliver the underlying assets to sponsoring banks. Others had to draw on the back-up credit line provided by banks. In both cases, the funding needs were ultimately transferred to the balance sheets of these banks, triggering a significant increase in the banks' liquidity needs. The magnitude of the phenomenon induced market participants and rating agencies to question and review the creditworthiness of many institutions and their ability to withstand further liquidity shocks. This adversely affected perceptions of the strength of the banking sector as a whole.

Although the problem initially originated in the United States, the global distribution of asset-backed paper and the global inter-connections within the banking system soon turned it into a global phenomenon. The funding gap created by the reduced issuance of short-term ABSs in the United States and Europe was substantial, so it is fair to assume that most of the funding requirement has been transferred to the banking system. These pressures have materialised in the sharp increases of the unsecured borrowing

rates for the major currencies. This has led to a significant widening of the spreads between secured and unsecured money market rates. A further significant decline in banks' asset prices could lead to a situation of mounting bank losses, liquidity problems and increased borrowing costs, all possibly coinciding with a time of generally challenging financial market conditions, and therefore posing significant risks to the financial system as a whole.

Having outlined some of the features of the market for securitisation, the remainder of this special feature quantifies observed changes in the market using available data sources. These sources are introduced in the next section.

DATA SOURCES[2]

A critical issue identified by policy-makers is the lack of sufficient data on credit risk concentrations, which hinders policy-makers' assessment of the implications of the turmoil and actions to ensure a timely response. Apart from the commercial data providers, the European Securitisation Forum (ESF) is currently the most commonly used, publicly available source of data on securitisation in Europe. The ESF has provided data on new European securitisation since autumn 2001 and on outstanding amounts since the summer of 2007. The data cover those securities for which collateral originates in a European Union (EU) country; for collateralised debt obligations (CDOs), data are provided only on euro-denominated issuance, regardless of the country of collateral. The data, therefore, cover all securitised assets issued worldwide that are backed by EU collateral. The ESF publishes a quarterly market data report, making available total aggregate values by country, by collateral and, more recently, by rating category. The ESF collates data through voluntary disclosures by financial institutions; the information on new issuance is then retrieved through Bloomberg data services, using the ISIN of the asset issued.

In parallel, the European Central Bank (ECB), in cooperation with the national central banks of the European System of Central Banks (ESCB), has identified resident FVCs, with the aim of retrieving information on their issuance of securities.[3] The ECB has thus established a provisional list of European FVCs as at end-2006 and end-2007.

By combining these two sources, using ISIN codes as a matching device, it has been possible to provide a broader picture of securitisation in the EU, hitherto unavailable. The two data sources have complementary characteristics. While the ESF data covers assets secured on EU collateral, it does not cover issuance on non-EU collateral. Conversely, the FVC data cover all securitised assets issued in the EU, regardless of the origin of collateral.

SECURITISATION IN THE EURO AREA AFTER THE TURMOIL

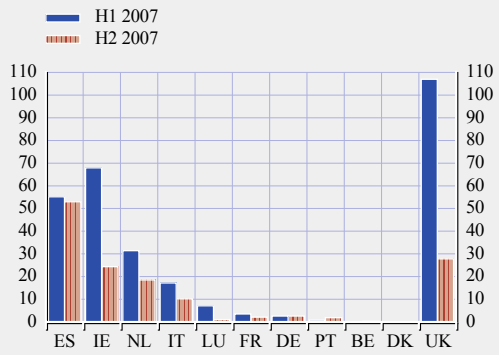
Securitisation in the euro area was less affected by the eruption of the turmoil than that in non-euro-area EU countries. In the second half of 2007, issuance in the euro area dropped by 38.6% to €114.1 billion, whereas that in other EU countries, most of which was accounted for by the United Kingdom, decreased by 74% to €27.8 billion (see Chart E.1). Moreover, in some countries, in particular Spain, there was little evidence of issuance being in any way negatively affected by the turmoil; new securitisation there remained at the same level in the second half of 2007. On account of these developments, the share of new issuance of euro area countries in total new EU securitisation increased from 63.5% in the first half of 2007 to 80.4% in the second half. The fact that issuance in the euro area was less affected by the turmoil than that in the United Kingdom may be related to the eligible collateral policy of the ECB's open market operations, where banks can obtain liquidity in exchange for highly rated ABSs. Thus, on account of challenging liquidity and

2 For further details, see P. Poloni and J. Reynaud, "How to measure credit risk transfer in the EU," presented at the Fourth IFC Conference "Measuring Financial Innovation and its Impact", Basel, August 2008.

3 This development was also prompted by the forthcoming regulation of FVCs and the desire to broaden harmonised euro area statistics on securitisation by 2010.

Chart E.1 New securitisation in the EU, broken down by country of issuance

(H1 2007 – H2 2007; EUR billions)

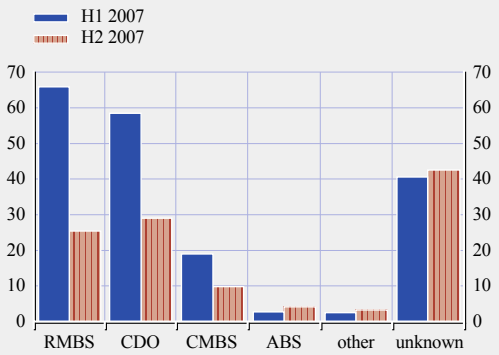


	H1 2007	H2 2007
Total EU	292.9	141.9
of which EA	185.9	114.1

Sources: ECB, European Securitisation Forum and ECB calculations.

Chart E.2 New securitisation in the euro area, broken down by type of security

(H1 2007 – H2 2007; EUR billions)



Sources: ECB, European Securitisation Forum and ECB calculations.

funding conditions after the turmoil erupted, banks issued ABSs and, in particular, residential mortgage-backed securities (RMBSs) with the intention of keeping them on their balance sheets. The most highly rated tranches could then be easily used to access the liquidity provided by the Eurosystem.[4]

Regarding the breakdown of instruments by type, the data revealed that in the euro area, the decline in issuance was similar in magnitude for CDOs and commercial mortgage-backed securities (CMBSs); issuance increased slightly in the consumer ABS segment, but decreased substantially in the case of RMBSs (see Chart E.2). It cannot be excluded, however, that a large amount of issuance that could not be classified was accounted for by securities backed by mortgages. The actual decline in issuance of RMBS, may, therefore, have been less pronounced than the data indicate. This conclusion is confirmed by data from other sources, including those provided by the ESF.[5] These sources report clear evidence of investors' preferences for the simplest structured products, including collateralised loan obligations (CLOs) and various types of ABSs; more complex products, such as CDOs, were discriminated among investors.

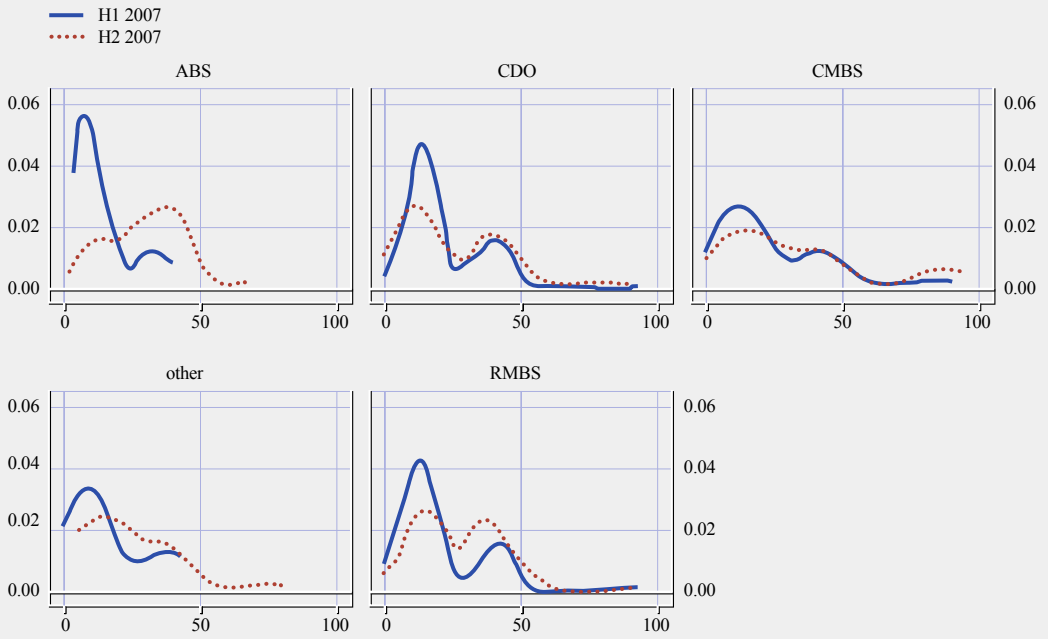
Since the data include both issuance and maturity dates, it was possible to determine the maturity profile of each instrument and to observe its evolution from the first half of 2007 to the second half of 2007. The kernel density functions of the initial maturities revealed that the two typical maturity periods for RMBSs issued in the euro area were 15 years and 40 years. CDOs were characterised by a similar maturity pattern, which suggests that these structured securities were backed mostly by RMBSs. CMBSs were marked by the longest maturities; the maximum density, however, was close to the ten-year maturity. On the other hand, ABSs were characterised by the shortest maturities – around five years. Nevertheless, maturities of ABSs issued in the second half of 2007 increased substantially. Other types of structured credit securities were characterised by increasing original maturities (see Chart E.3).

4 See also Box 3 in ECB, "The impact of traditional true-sale securitisation on recent MFI loan developments", *Monthly Bulletin*, September 2008.

5 See The Securities Industry & Financial Markets Association (SIMFA), "ESF Securitisation Data Report – Q2, 2007", and SIMFA, "ESF Securitisation Data Report – Q4, 2007".

Chart E.3 Kernel density functions of the original maturity, broken down by type of security

(H1 2007 – H2 2007)



Sources: ECB, European Securitisation Forum and ECB calculations.

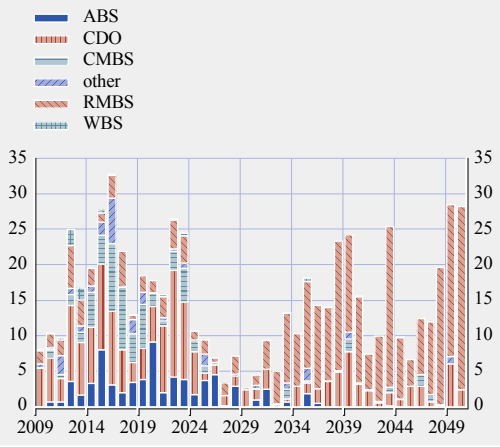
This may be explained by the investors' preference for repackaging mortgages and loans of longer maturities, which should, on average, be less risky on account of the lower repayment burdens on households. Lower monthly payments make the financial buffer of a household higher, and thus the probability of default lower. In this regard, extending the maturities of loans is a measure of the improved performance of ABSs. Issuers, who were seeking to restore investor confidence, repackaged the mortgages and loans of longer maturities in the second half of the quarter. It is worth noting, however, that securities with longer maturities are generally more volatile with respect to changes in interest rates, a result of the stronger impact of discount factors used when calculating the current discounted value of future cash flows from credit security payments. By mid-2008, the price volatility risk of these credit securities had not materialised, as the ECB reference rate had changed little since the beginning of the turmoil. Nevertheless, as investors are now more exposed to that risk, due to longer maturities of credit securities, this may prove to be relevant in the period ahead.

The breakdown of amounts outstanding of securities by remaining maturity and type revealed some additional information on the period when the bulk of the outstanding volume of particular types of securities will mature (see Chart E.4). Most of the volume of RMBSs outstanding will mature beyond the year 2030. Most of the volume of CDOs, however, will mature by 2024. This suggests that most RMBSs with relatively short maturities have been repackaged into CDO structures. Thus, investors in RMBSs are most exposed to the price volatility risk, which may be relevant for the banking sector; the bulk of these assets have now been retained on bank balance sheets. Banks are subject to fair-value accounting, and thus have to mark the value of credit securities held on their balance sheets to market.[6] Apart

6 More recently, some easing of fair-value accounting regulations has been approved by the International Accounting Standards Board as part of wider plans to support the financial system.

Chart E.4 Securitisation amounts outstanding in the euro area maturing in particular years, broken down by type of security

(amounts outstanding as at end-2007; EUR billions)



Sources: ECB, European Securitisation Forum and ECB calculations.

from the housing price risk and the credit risk involved in RMBSs, such securities are also exposed to interest rate movements. For very long maturities, the discounting factor may be even more important for the price of securities than the performance of the underlying mortgages.

Since the analysis is based on security-by-security data, it can be linked to the data in the external databases of rating agencies, so as to observe the rating history of each security. The quality of the securities, in terms of the rating category, was found, on average, to be very high. Almost half of all securities were rated double A or higher when they were issued, while two-thirds were rated A- or higher. Slightly more than 6% of the securities were rated CCC+ or lower. The rating migration matrix, which combines the information on the initial ratings on the date of issuance with the current ratings, revealed that up to mid-2008 there was little evidence of significant downgrades (see Table E.1). The securities impacted most were those with initial ratings of single A – 17.5% of which had been

Table E.1 Rating migration matrix for euro area structured credit securities

(percentage of total by issuance rating; rating as of mid-2008)

	Initial rating																					
	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	NR
AAA	90.3	14.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AA+	0.9	71.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AA	3.2	9.5	96.3	9.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AA-	0.0	0.0	0.0	72.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
A+	0.0	0.0	2.4	0.0	67.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
A	0.0	0.0	0.0	9.1	25.0	89.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
A-	1.2	0.0	0.0	9.1	2.5	5.2	85.0	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BBB+	0.0	0.0	0.0	0.0	2.5	0.0	15.0	66.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BBB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.6	92.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BBB-	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.8	93.8	16.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BB+	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	50.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BB	2.1	0.0	1.2	0.0	2.5	5.2	0.0	0.0	0.0	3.1	33.3	86.5	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BB-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.6	90.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B+	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0	90.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B-	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0
CCC+	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0
CCC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	83.3	10.0	0.0	0.0	0.0
CCC-	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	16.7	80.0	60.0	0.0	0.0
CC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.0	0.0	0.0
C	0.0	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	100.0	0.0
NR	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0

Sources: ECB, DCM Analytics, European Securitisation Forum, Moody's and ECB calculations.
Note: "NR" denotes "not rated".

downgraded, with one-quarter thereof being downgraded by more than one category. In most other rating categories, the share of securities downgraded ranged from 7% to 12%. In the triple and double-A categories, downgrades were less severe. In the lower rating categories, however, the rate of downgrades was outweighed, to some extent, by upgrades.

The relatively low rates of downgrades of securities issued in the euro area suggest that they have been relatively resilient thus far, in spite of the ongoing market stress. This implies that the loans underlying these securities have performed relatively well.

CONCLUDING REMARKS

The securitisation process was subject to increased scrutiny in 2007 and 2008, not least due to its perceived role in the emergence of the financial turmoil. Based on new sources of data, introduced in this special feature, several conclusions can be drawn.

First, the lack of sufficient statistical data on credit risk transfers has emerged as an important issue for both central banks and the financial industry, as asymmetric information and a misalignment of incentives have been identified as inherent weaknesses in the securitisation model.[7]

Second, various market segments have borne the brunt of the crisis: in the CDO market, only multinational issuance remains unaffected; the United Kingdom and Ireland appear to have suffered the steepest declines, which may be related to their status as the largest issuers; regarding maturities, while there is a clear shift to longer-term issuance, it will remain difficult to transform maturities, so that a peak can be expected in five to ten years.

Third, since the turmoil erupted in August 2007, investor preference has shifted towards securities with longer maturities. Although this may indicate that the performance of underlying loans and, in particular, mortgages may thus improve on account of the lower repayment burdens of borrowers, it may have further exposed investors to price volatility risk, which should be managed adequately.

Finally, up to mid-2008, there has been little evidence of any significant rating downgrades of securities issued in the euro area. This results from the fact that, on average, the performance of the underlying loans has been substantially better than the sub-prime mortgages originated in the U.S. Nevertheless, the ongoing tensions in credit markets and the potential continuation of the downward trend in house prices in the euro area may adversely affect the performance of mortgages further, which could negatively impact ratings in the period ahead.

7 While it may be argued that the complexity of these markets hampers the collection of comprehensive statistical data, this special feature has shown that initiatives can provide important data on this market segment; market complexity itself is not a barrier to the compilation of data.

GLOSSARY

Adjustable-rate mortgage (ARM): A mortgage with an interest rate that remains at a predetermined (usually favourable) level for an initial fixation period, but can thereafter be changed by the lender. While ARMs in many countries allow rate changes at the lender's discretion (also referred to as "discretionary ARMs"), rate changes for most ARMs in the United States are based on a pre-selected interest rate index over which the lender has no control.

Alternative-A (Alt-A): A mortgage risk category that falls between prime and sub-prime. The credit risk associated with Alt-A mortgage lending tends to be higher than that of prime mortgage lending on account of e.g. little or no borrower documentation (i.e. income and/or asset certainties) and/or a higher loan-to-value ratio, but lower than that of sub-prime mortgage lending due to a less (or non-)adverse credit history.

Asset-backed commercial paper (ABCP): A short-term debt instrument that is backed by a form of collateral provided by the issuer, which generally has a maturity of no more than 270 days and which is either interest-bearing or discounted. The assets commonly used as collateral in the case of financing through ABCP conduits include trade receivables, consumer debt receivables and collateralised debt obligations.

Asset-backed security (ABS): A security that is collateralised by the cash flows from a pool of underlying assets, such as loans, leases and receivables. Often, when the cash flows are collateralised by real estate, an ABS is called a mortgage-backed security.

Basel II: An accord providing a comprehensive revision of the Basel capital adequacy requirements issued by the Basel Committee on Banking Supervision (BCBS). Pillar I of the accord covers the minimum capital adequacy standards for banks, Pillar II focuses on enhancing the supervisory review process and Pillar III encourages market discipline through increased disclosure of banks' financial conditions.

Central bank credit (liquidity) facility: A standing credit facility which can be drawn upon by certain designated account holders (e.g. banks) at a central bank. The facility can be used automatically at the initiative of the account holder. The loans typically take the form of either advances or overdrafts on an account holder's current account which may be secured by a pledge of securities or by repurchase agreements.

Collateralised debt obligation (CDO): A structured debt instrument backed by the performance of a portfolio of diversified securities, loans or credit default swaps, the securitised interests in which are divided into tranches with differing streams of redemption and interest payments. When the tranches are backed by securities or loans, the structured instrument is called a "cash" CDO. Where it is backed only by loans, it is referred to as a collateralised loan obligation (CLO) and when backed by credit default swaps, it is a "synthetic" CDO.

Collateralised loan obligation (CLO): A CDO backed by whole commercial loans, revolving credit facilities or letters of credit.

Combined ratio: A financial ratio for insurers, which is calculated as the sum of the loss ratio and the expense ratio. Typically, a combined ratio of more than 100% indicates an underwriting loss for the insurer.

Commercial mortgage-backed security (CMBS): A security with cash flows generated by debt on property that focuses on commercial rather than residential property. Holders of such securities receive payments of interest and principal from the holders of the underlying commercial mortgage debt.

Commercial paper: Short-term obligations with maturities ranging from 2 to 270 days issued by banks, corporations and other borrowers. Such instruments are unsecured and usually discounted, although some are interest-bearing.

Conduit: A financial intermediary, such as a special-purpose vehicle (SPV) or a special investment vehicle (SIV), which funds the purchase of assets through the issuance of asset-backed securities such as commercial paper.

Credit default swap (CDS): A swap designed to transfer the credit exposure of fixed-income products between parties. The buyer of a credit swap receives credit protection, whereas the seller of the swap guarantees the creditworthiness of the product. By doing this, the risk of default is transferred from the holder of the fixed-income security to the seller of the swap.

Debit balance: The amount that an enterprise or individual owes a lender, seller or factor.

Delinquency: A (mortgage) debt service payment that is more than a pre-defined number of days behind schedule (typically at least 30 days late).

Distance to default: A measure of default risk that combines the asset value, the business risk and the leverage of an asset. The distance to default compares the market net worth to the size of a one standard deviation move in the asset value.

Earnings per share (EPS): The amount of a company's earnings that is available per ordinary share issued. These earnings may be distributed in dividends, used to pay tax, or retained and used to expand the business. Earnings per share are a major determinant of share prices.

EMBIG spreads: J.P. Morgan's Emerging Markets Bond Index Global (EMBI Global) spreads. The EMBI Global tracks US dollar-denominated debt instruments issued by sovereign and quasi-sovereign entities in emerging markets, such as Brady bonds, loans, and Eurobonds. It covers over 30 emerging market countries.

Euro commercial paper (ECP): A short-term debt instrument with a maturity of up to one year that is issued by prime issuers on the euro market, using US commercial paper as a model. Interest is accrued or paid by discounting the nominal value, and is influenced by the issuer's credit rating.

Euro interbank offered rate (EURIBOR): The rate at which a prime bank is willing to lend funds in euro to another prime bank. The EURIBOR is calculated daily for interbank deposits with a maturity of one week and one to 12 months as the average of the daily offer rates of a representative panel of prime banks, rounded to three decimal places.

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

Euro overnight index average (EONIA) swap index: A reference rate for the euro on the derivatives market, i.e. the mid-market rate at which euro overnight index average (EONIA) swaps, as quoted by a representative panel of prime banks that provide quotes in the EONIA swap market, are traded. The index is calculated daily at 4:30 p.m. CET and rounded to three decimal places using an actual/360 day-count convention.

Exchange-traded fund (ETF): A collective investment scheme that can be traded on an organised exchange at any time in the course of the business day.

Expected default frequency (EDF): A measure of the probability that an enterprise will fail to meet its obligations within a specified period of time (usually the next 12 months).

Expense ratio: For insurers, the expense ratio denotes the ratio of expenses to the premium earned.

Fair value accounting (FVA): A valuation principle that stipulates the use of either a market price, where it exists, or an estimation of a market price as the present value of expected cash flows to establish the balance sheet value of financial instruments.

Financial obligations ratio: A financial ratio for the household sector which covers a broader range of financial obligations than the debt service ratio, including automobile lease payments, rental payments on tenant-occupied property, homeowners' insurance and property tax payments.

Foreclosure: The legal process through which a lender acquires possession of the property securing a mortgage loan when the borrower defaults.

Funding liquidity: A measure of the ease with which asset portfolios can be funded.

Home equity borrowing: Borrowing drawn against the equity in a home, calculated as the current market value less the value of the first mortgage. When originating home equity borrowing, the lending institution generally secures a second lien on the home, i.e. a claim that is subordinate to the first mortgage (if it exists).

Household debt service ratio: The ratio of debt payments to disposable personal income. Debt payments consist of the estimated required payments on outstanding mortgage and consumer debt.

Implied volatility: A measure of expected volatility (standard deviation in terms of annualised percentage changes) in the prices of e.g. bonds and stocks (or of corresponding futures contracts) that can be extracted from option prices. In general, implied volatility increases when market uncertainty rises and decreases when market uncertainty falls.

Initial margin: A proportion of the value of a transaction that traders have to deposit to guarantee that they will complete it. Buying shares on margin means contracting to buy them without actually paying the full cash price immediately. To safeguard the other party, a buyer is required to deposit a margin, i.e. a percentage of the price sufficient to protect the seller against loss if the buyer fails to complete the transaction.

Interest rate swap: A contractual agreement between two counterparties to exchange cash flows representing streams of periodic interest payments in one currency. Often, an interest rate swap

involves exchanging a fixed amount per payment period for a payment that is not fixed (the floating side of the swap would usually be linked to another interest rate, often the LIBOR). Such swaps can be used by hedgers to manage their fixed or floating assets and liabilities. They can also be used by speculators to replicate unfunded bond exposures to profit from changes in interest rates.

Investment-grade bonds: A bond that has been given a relatively high credit rating by a major rating agency, e.g. "BBB" or above by Standard & Poor's.

iTraxx: The brand name of a family of indices that cover a large part of the overall credit derivatives markets in Europe and Asia.

Large and complex banking group (LCBG): A banking group whose size and nature of business is such that its failure or inability to operate would most likely have adverse implications for financial intermediation, the smooth functioning of financial markets or of other financial institutions operating within the financial system.

Leverage: The ratio of a company's debt to its equity, i.e. to that part of its total capital that is owned by its shareholders. High leverage means a high degree of reliance on debt financing. The higher a company's leverage, the more of its total earnings are absorbed by paying debt interest, and the more variable are the net earnings available for distribution to shareholders.

Leveraged buyout (LBO): The acquisition of one company by another through the use of primarily borrowed funds, the intention being that the loans will be repaid from the cash flow generated by the acquired company.

Leveraged loan: A bank loan that is rated below investment grade (e.g. "BB+" and lower by Standard & Poor's and Fitch, or "Ba1" and lower by Moody's) to firms characterised by high leverage.

LIBOR: The London interbank offered rate is an index of the interest rates at which banks offer to lend unsecured funds to other banks in the London wholesale money market.

Loss ratio: For insurers, the loss ratio is the net sum total of the claims paid out by an insurance company or underwriting syndicate, expressed as a percentage of the sum total of the premiums paid in during the same period.

Margin call: A procedure related to the application of variation margins, implying that if the value, as regularly measured, of the underlying assets falls below a certain level, the (central) bank requires counterparties to supply additional assets (or cash). Similarly, if the value of the underlying assets, following their revaluation, were to exceed the amount owed by the counterparties plus the variation margin, the counterparty may ask the (central) bank to return the excess assets (or cash) to the counterparty.

Mark to market: The revaluation of a security, commodity, a futures or option contract or any other negotiable asset position to its current market, or realisable, value.

Mark to model: The pricing of a specific investment position or portfolio based on internal assumptions or financial models.

Market liquidity: A measure of the ease with which an asset can be traded on a given market.

Monetary financial institution (MFI): One of a category of financial institutions which together form the money-issuing sector of the euro area. Included are the Eurosystem, resident credit institutions (as defined in Community law) and all other resident financial institutions, the business of which is to receive deposits and/or close substitutes for deposits from entities other than MFIs and, for their own account (at least in economic terms), to grant credit and/or invest in securities. The latter group consists predominantly of money market funds.

Mortgage-backed security (MBS): A security with cash flows that derive from the redemption of principal and interest payments relating to a pool of mortgage loans.

Net asset value (NAV): The total value of fund's investments less liabilities. Also referred to as capital under management.

Open interest: The total number of contracts in a commodity or options market that are still open, i.e. that have not been exercised, closed out or allowed to expire.

Originate-to-distribute model: A business model in which debt is generated, i.e. originated, and subsequently broken up into tranches for sale to investors, thereby spreading the risk of default among a wide group of investors.

Overnight index swap (OIS): An interest rate swap whereby the compounded overnight rate in the specified currency is exchanged for some fixed interest rate over a specified term.

Price/earnings (P/E) ratio: The ratio between the value of a corporation, as reflected in its stock price, and its annual profits. It is often calculated on the basis of the profits generated by a corporation over the previous calendar year (i.e. a four-quarter moving average of profits). For a market index such as the Standard & Poor's 500, the P/E ratio is the average of the P/E ratios of the individual corporations in that index.

Primary market: The market in which new issues of securities are sold or placed.

Private equity: Shares in privately held companies that are not listed on a public stock exchange.

Profit and loss (P&L) account: The financial statement that summarises the difference between the revenues and expenses of a firm – non-financial or financial – over a given period. Such statements may be drawn up frequently for the managers of a business, but a full audited statement is normally only published for each accounting year.

Residential mortgage-backed security (RMBS): A security with cash flows that derive from residential debt such as mortgages and home-equity loans.

Return on equity (ROE): A measure of the profitability of holding (usually) ordinary shares in a company that is arrived at by dividing the company's net after-tax profit, less dividends on preference shares, by the ordinary shares outstanding.

Risk reversal: A specific manner of quoting similar out-of-the-money call and put options, usually foreign exchange options. Instead of quoting the prices of these options, dealers quote their volatility. The greater the demand for an options contract, the greater its volatility and its price. A positive risk reversal means that the volatility of calls is greater than the volatility of similar puts,

which implies that more market participants are betting on an appreciation of the currency than on a sizeable depreciation.

Risk-weighted asset: An asset that is weighted by factors representing its riskiness and potential for default, i.e. in line with the concept developed by the Basel Committee on Banking Supervision (BCBS) for its capital adequacy requirements.

Secondary market: A market in which existing securities (i.e. issues that have already been sold or placed through an initial private or public offering) are traded.

Securitisation: The process of issuing new negotiable securities backed by existing assets such as loans, mortgages, credit card debt, or other assets (including accounts receivable).

Senior debt: Debt that has precedence over other obligations with respect to repayment if the loans made to a company are called in for repayment. Such debt is generally issued as loans of various types with different risk-return profiles, repayment conditions and maturities.

Skewness: A measure of data distributions that shows whether large deviations from the mean are more likely towards one side than towards the other. In the case of a symmetrical distribution, deviations either side of the mean are equally likely. Positive skewness means that large upward deviations are more likely than large downward ones. Negative skewness means that large downward deviations are more likely than large upward ones.

Solvency ratio: The ratio of a bank's own assets to its liabilities, i.e. a measure used to assess a bank's ability to meet its long-term obligations and thereby remain solvent. The higher the ratio, the more sound the bank.

Sovereign wealth fund (SWF): A special investment fund created/owned by a government to hold assets for long-term purposes; it is typically funded from reserves or other foreign-currency sources, including commodity export revenues, and predominantly has significant ownership of foreign currency claims on non-residents.

Special-purpose vehicle (SPV): A legal entity set up to acquire and hold certain assets on its balance sheet and to issue securities backed by those assets for sale to third parties.

Speculative-grade bond: A bond that has a credit rating that is not investment grade, i.e. below that determined by bank regulators to be suitable for investments, currently "Baa" (Moody's) or "BBB" (Standard & Poor's).

Strangle: An options strategy that involves buying a put option with a strike price below that of the underlying asset, and a call option with a strike price above that of the underlying asset (i.e. strike prices that are both out-of-the-money). Such an options strategy is profitable only if there are large movements in the price of the underlying asset.

Stress testing: The estimation of credit and market valuation losses that would result from the realisation of extreme scenarios, so as to determine the stability of the financial system or entity.

Structured credit product: A transaction in which a bank, typically, sells a pool of loans it has originated itself to a bankruptcy-remote special-purpose vehicle (SPV), which pays for these assets by issuing tranches of a set of liabilities with different seniorities.

Structured investment vehicle (SIV): A special-purpose vehicle (SPV) that undertakes arbitrage activities by purchasing mostly highly rated medium and long-term, fixed-income assets and that funds itself with cheaper, mostly short-term, highly rated commercial paper and medium-term notes (MTNs). While there are a number of costs associated with running a structured investment vehicle, these are balanced by economic incentives: the creation of net spread to pay subordinated noteholder returns and the creation of management fee income. Vehicles sponsored by financial institutions also have the incentive to create off-balance-sheet fund management structures with products that can be fed to existing and new clients by way of investment in the capital notes of the vehicle.

Subordinated debt: A debt that can only be claimed by an unsecured creditor, in the event of a liquidation, after the claims of secured creditors have been met, i.e. the rights of the holders of the stock of debt are subordinate to the interests of depositors. Debts involving speculative-grade bonds are always subordinated to debts vis-à-vis banks, irrespective of whether or not they are secured.

Subordination: A mechanism to protect higher-rated tranches against shortfalls in cash flows from underlying collateral provided in the form of residential mortgage-backed securities (RMBSs), by way of which losses from defaults of the underlying mortgages are applied to junior tranches before they are applied to more senior tranches. Only once a junior tranche is completely exhausted will defaults impair the next tranche. Consequently, the most senior tranches are extremely secure against credit risk, are rated "AAA", and trade at lower spreads.

Sub-prime borrower: A borrower with a poor credit history and/or insufficient collateral who does not, as a consequence thereof, qualify for a conventional loan and can borrow only from lenders that specialise in dealing with such borrowers. The interest rates charged on loans to such borrowers include a risk premium, so that it is offered at a rate above prime to individuals who do not qualify for prime rate loans.

TARGET (Trans-European Automated Real-time Gross settlement Express Transfer system): A payment system comprising a number of national real-time gross settlement (RTGS) systems and the ECB payment mechanism (EPM). The national RTGS systems and the EPM are interconnected by common procedures (interlinking) to provide a mechanism for the processing of euro payments throughout the euro area and some non-euro area EU Member States.

TARGET2: A new generation of TARGET, designed to offer a harmonised level of service on the basis of a single technical platform, through which all payment transactions are submitted and processed in the same technical manner.

Term auction facility (TAF): A form of central bank credit (liquidity) facility.

Tier 1 capital: Equity represented by ordinary shares and retained profit or earnings plus qualifying non-cumulative preference shares (up to a maximum of 25% of total Tier 1 capital) plus minority interests in equity accounts of consolidated subsidiaries. The level of Tier 1 capital is a measure of the capital adequacy of a bank, which is calculated as the ratio of a bank's core equity capital to its total risk-weighted assets.

Tier 2 capital: The second most reliable form of financial capital, from a regulator's point of view that is also used as a measure of a bank's financial strength. It includes, according to the concept developed by the Basel Committee on Banking Supervision (BCBS) for its capital adequacy requirements, undisclosed reserves, revaluation reserves, general provisions, hybrid instruments and subordinated term debt.

Triggers of net asset value cumulative decline: Triggers of total NAV or NAV-per-share cumulative decline represent contractual termination events which allow counterparties to terminate transactions and seize the collateral held.

Value at risk (VaR): A risk measure of a portfolio's maximum loss during a specific period of time at a given level of probability.

Variation margin: In margin deposit trading, these are the funds required to be deposited by an investor when a price movement has caused funds to fall below the initial margin requirement. Conversely, funds may be withdrawn by an investor when a price movement has caused funds to rise above the margin requirement.

Write-down: An adjustment to the value of loans recorded on the balance sheets of financial institutions. A loan is written down when it is recognised as having become partly unrecoverable, and its value on the balance sheet is reduced accordingly.

Write-off: An adjustment to the value of loans recorded on the balance sheets of financial institutions. A loan is written off when it is considered to be totally unrecoverable, and is removed from the balance sheet.

Yield curve: A curve describing the relationship between the interest rate or yield and the maturity at a given point in time for debt securities with the same credit risk but different maturity dates. The slope of the yield curve can be measured as the difference between the interest rates at two selected maturities.

STATISTICAL ANNEX

1 EXTERNAL ENVIRONMENT

2 INTERNATIONAL FINANCIAL MARKETS

3 EURO AREA ENVIRONMENT

4 EURO AREA FINANCIAL MARKETS

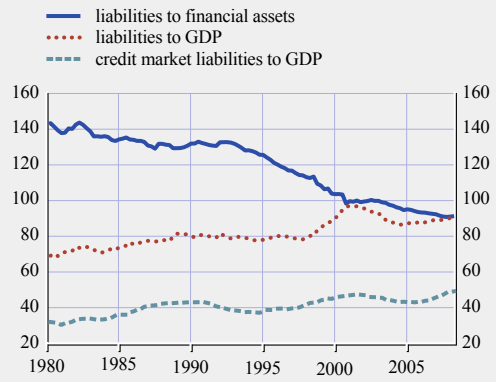
5 EURO AREA FINANCIAL INSTITUTIONS

6 EURO AREA FINANCIAL SYSTEM INFRASTRUCTURES

I EXTERNAL ENVIRONMENT

Chart S1 US non-farm, non-financial corporate sector liabilities

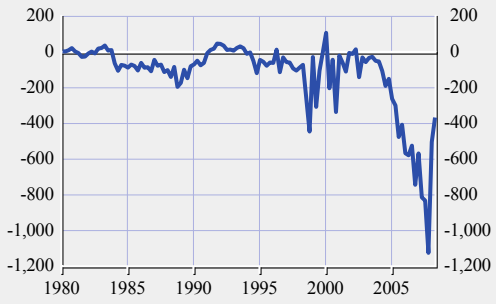
(Q1 1980 – Q2 2008; percentage)



Sources: US Federal Reserve Board and Bureau of Economic Analysis.

Chart S2 US non-farm, non-financial corporate sector net equity issuance

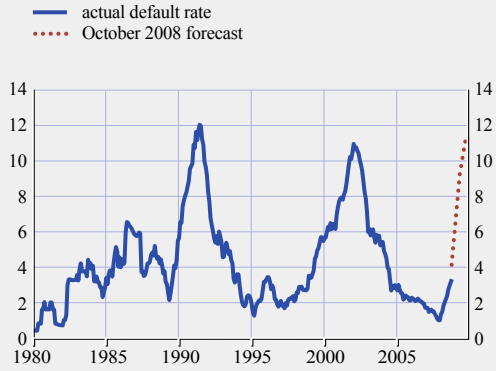
(Q1 1980 – Q2 2008; USD billions; seasonally adjusted quarterly annualised data)



Source: US Federal Reserve Board.

Chart S3 US speculative-grade-rated corporations' default rates and forecast

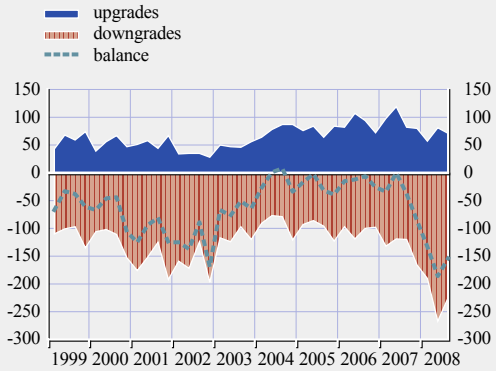
(Jan. 1980 – Oct. 2009; percentage; 12-month trailing sum)



Source: Moody's.

Chart S4 US corporate sector rating changes

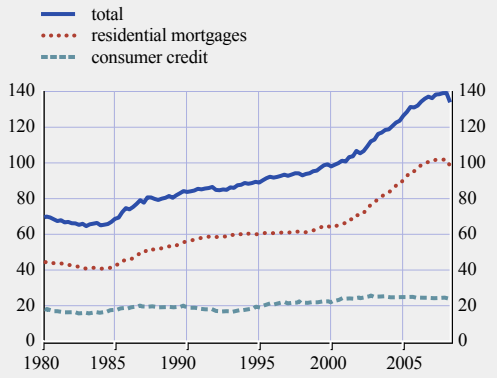
(Q1 1999 – Q3 2008; number)



Source: Moody's.

Chart S5 US household sector debt-to-disposable income ratio

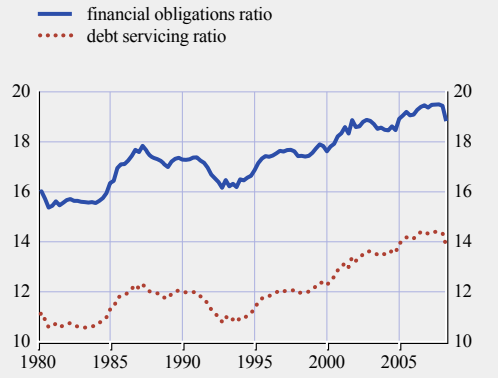
(Q1 1980 – Q2 2008; percentage of disposable income)



Source: US Federal Reserve Board.

Chart S6 US household sector debt burden

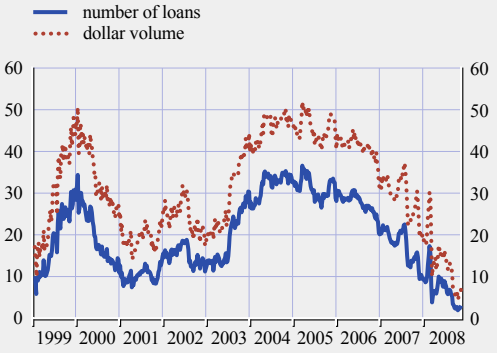
(Q1 1980 – Q2 2008; percentage of disposable income)



Source: US Federal Reserve Board.

Chart S7 Share of adjustable-rate mortgages in the United States

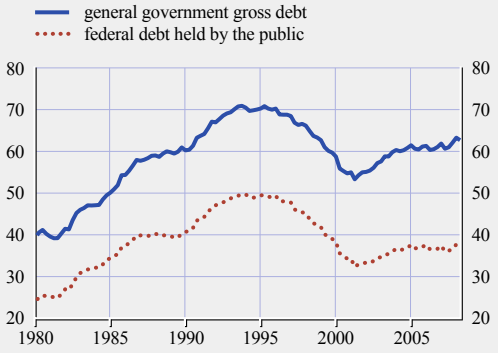
(Jan. 1999 – Nov. 2008; percentage of total new mortgages)



Source: Mortgage Bankers Association.

Chart S8 US general government and federal debt-to-GDP ratio

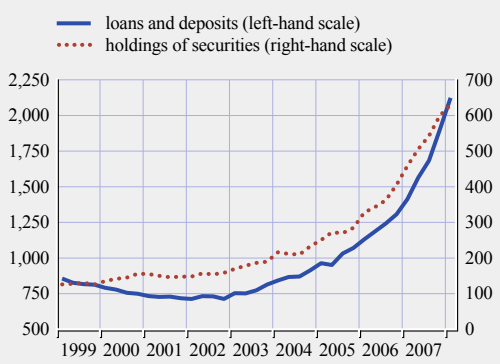
(Q1 1980 – Q2 2008; percentage of GDP)



Sources: US Federal Reserve Board and Bureau of Economic Analysis.
Note: General government gross debt comprises federal, state and local government gross debt.

Chart S9 International positions of all BIS reporting banks vis-à-vis emerging markets

(Q1 1999 – Q1 2008; USD billions)



Source: Bank for International Settlements (BIS).

Table S1 Financial vulnerability indicators for selected emerging market economies

	Current account balance (% of GDP)			External debt (% of GDP)			Short-term external debt (% of reserves)			Foreign reserves (in months of imports)		
	2007	2008 (f)	2009 (f)	2007	2008 (f)	2009 (f)	2007	2008 (f)	2009 (f)	2007	2008 (f)	2009 (f)
Latin America												
Argentina	2.7	1.5	-1.2	57	49	47	48	50	48	8.5	6.4	6.0
Brazil	0.1	-1.8	-2.6	22	20	24	28	26	25	10.9	9.5	8.9
Chile	4.4	2.7	-	29	26	-	46	48	-	2.7	2.7	-
Colombia	-3.4	-2.8	-3.1	26	21	22	26	23	20	5.3	5.7	6.2
Mexico	-0.6	-0.4	-0.8	17	15	14	40	37	35	3.2	3.2	3.1
Venezuela	7.4	5.2	0.2	23	19	25	45	47	52	4.3	3.5	3.1
Asia												
China	11.3	9.1	8.7	11	10	9	14	12	11	16.8	17.9	19.3
India	-1.5	-3.1	-2.0	20	20	19	15	19	20	11.3	8.9	8.6
Indonesia	2.4	2.0	1.9	31	28	24	55	49	41	5.1	5.1	5.5
Malaysia	6.5	-	-	31	-	-	11	-	-	6.0	-	-
South Korea	0.1	-	-	23	-	-	40	-	-	6.5	-	-
Thailand	6.4	1.9	1.4	25	22	21	25	26	26	5.8	5.3	5.0
Emerging Europe												
Russia	5.8	5.8	2.7	34	30	30	28	24	23	15.1	14.4	14.3
Turkey	-5.7	-7.5	-7.3	40	39	42	60	72	81	4.6	3.6	3.5

Source: Institute of International Finance.
Note: Data for 2008 and 2009 are forecasts.

Table S2 Value-at-risk (VaR) amounts by category of risk for global large and complex banking groups

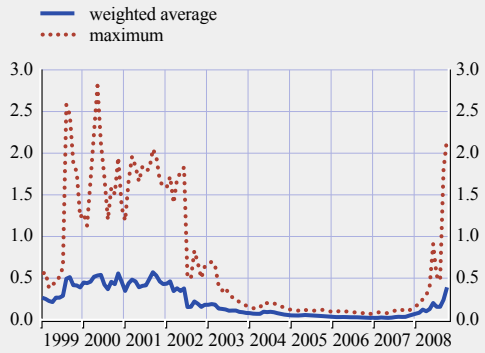
(USD millions; 99% confidence; ten-day holding period)

	Commodities	Equities	Interest rate	Foreign exchange
2006 average	56.5	103.4	166.9	46.3
2006 median	39.2	121.1	150.5	48.1
2007 average	65.0	141.0	252.5	58.0
2007 median	57.0	144.7	269.1	72.7

Sources: Securities and Exchange Commission (SEC) and institutions' quarterly reports.

Chart S10 Expected default frequencies (EDFs) for global large and complex banking groups

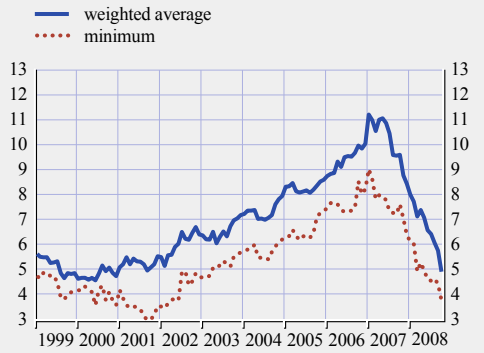
(Jan. 1999 – Oct. 2008; percentage probability)



Sources: Moody's KMV and ECB calculations.
Notes: The EDF provides an estimate of the probability of default over the following year. Due to measurement considerations, the EDF values are restricted by Moody's KMV to the interval between 0.01% and 35%.

Chart S11 Distance-to-default for global large and complex banking groups

(Jan. 1999 – Oct. 2008)



Sources: Moody's KMV and ECB calculations.
Note: An increase in the distance-to-default reflects an improving assessment.

Chart S12 Equity prices for global large and complex banking groups

(Jan. 2004 – Nov. 2008; index: Jan. 2004 = 100)

Sources: Bloomberg and ECB calculations.

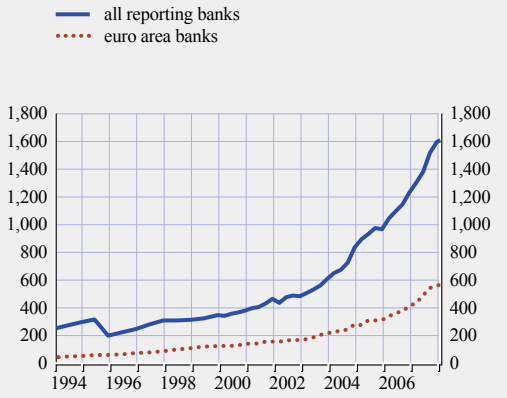
Chart S13 Credit default swap spreads for global large and complex banking groups

(Jan. 2004 – Nov. 2008; basis points; senior debt, five-year maturity)

Sources: Bloomberg and ECB calculations.

Chart S14 Global consolidated claims on non-banks in offshore financial centres

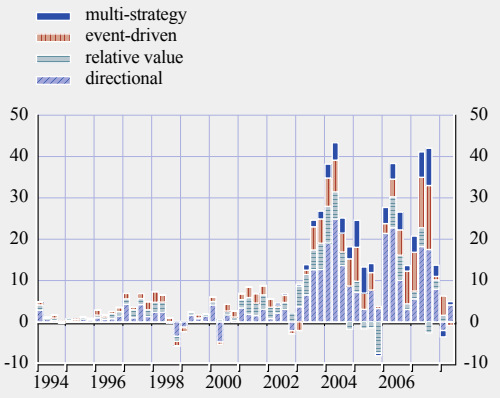
(Q1 1994 – Q1 2008; USD billions)



Source: BIS.

Chart S15 Global hedge fund net flows

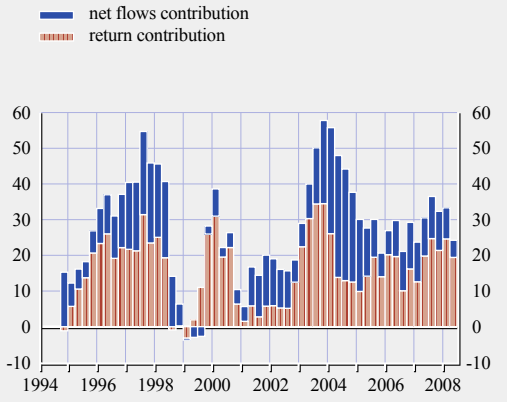
(Q1 1994 – Q2 2008; USD billions)



Source: Lipper TASS.
Note: Excluding funds of hedge funds. The directional group includes long/short equity hedge, global macro, emerging markets, dedicated short-bias and managed futures strategies. The relative value group consists of convertible arbitrage, fixed-income arbitrage and equity market-neutral strategies.

Chart S16 Decomposition of the annual rate of growth of global hedge fund capital under management

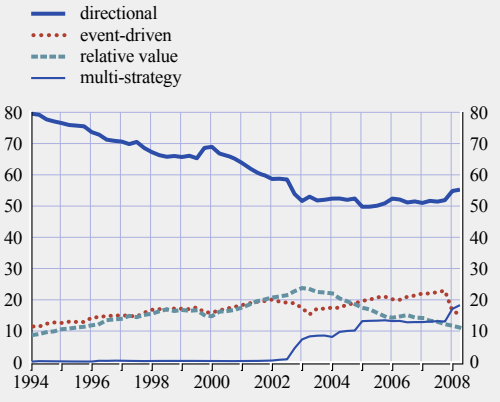
(Q4 1994 – Q2 2008; percentage; 12-month changes)



Sources: Lipper TASS and ECB calculations.
Note: Excluding funds of hedge funds. The estimated quarterly return to investors equals the difference between the change in capital under management and net flows. In this dataset, capital under management totalled USD 1.5 trillion at the end of June 2008.

Chart S17 Structure of global hedge fund capital under management

(Q1 1994 – Q2 2008; percentage)

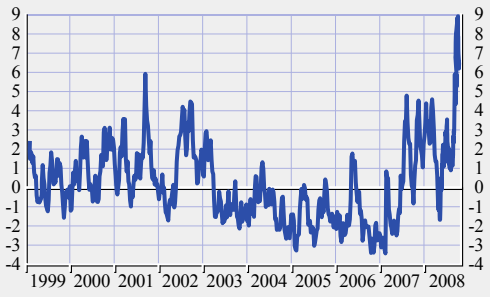


Sources: Lipper TASS and ECB calculations.
Note: Excluding funds of hedge funds. The directional group includes long/short equity hedge, global macro, emerging markets, dedicated short-bias and managed futures strategies. The relative value group consists of convertible arbitrage, fixed-income arbitrage and equity market-neutral strategies.

2 INTERNATIONAL FINANCIAL MARKETS

Chart S18 Global risk aversion indicator

(Jan. 1999 – Nov. 2008)



Sources: Chicago Board Options Exchange (CBOE), Merrill Lynch, UBS, Lehman Brothers, Westpac, Dresdner Kleinwort and ECB calculations.
Note: The indicator is constructed as the first principal component of six risk aversion indicators available at weekly frequency. A rise in the indicator denotes an increase of risk aversion. For further details about the methodology used, see ECB, "Measuring investors' risk appetite", *Financial Stability Review*, June 2007.

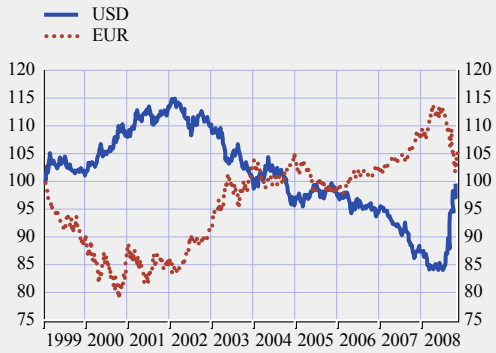
Chart S19 Real broad USD effective exchange rate index

(Jan. 1999 – Oct. 2008; index: Jan. 1999 = 100)

Source: US Federal Reserve Board.

Chart S20 Selected nominal effective exchange rate indices

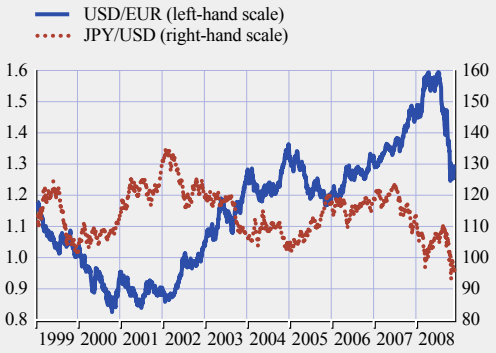
(Jan. 1999 – Nov. 2008; index: Jan. 1999 = 100)



Sources: US Federal Reserve Board and ECB.

Chart S21 Selected bilateral exchange rates

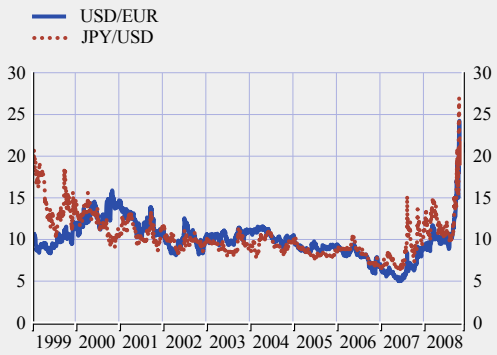
(Jan. 1999 – Nov. 2008)



Source: ECB.

Chart S22 Selected three-month implied foreign exchange market volatilities

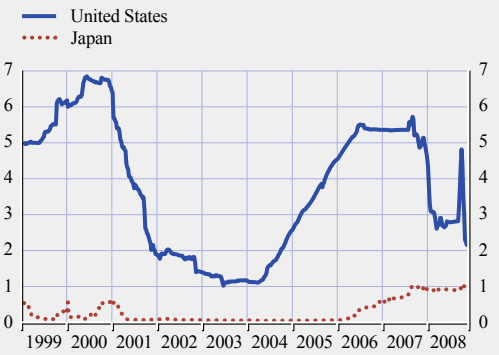
(Jan. 1999 – Nov. 2008; percentage)



Source: Bloomberg.

Chart S23 Three-month money market rates in the United States and Japan

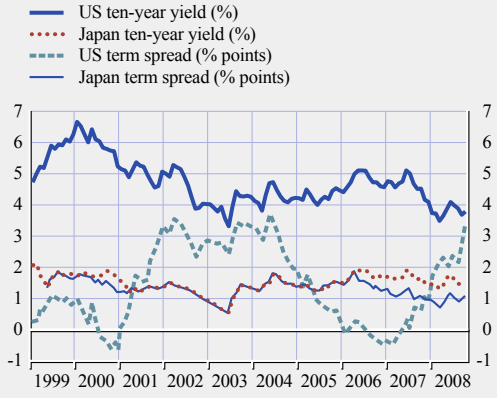
(Jan. 1999 – Nov. 2008; LIBOR; percentage)



Source: Bloomberg.

Chart S24 Government bond yields and term spreads in the United States and Japan

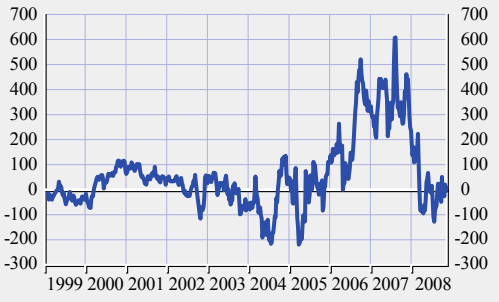
(Jan. 1999 – Oct. 2008)



Sources: ECB and Bloomberg.
Note: The term spread is the difference between the ten-year bond yield and the three-month T-bill yield.

Chart S25 Net non-commercial positions in ten-year US Treasury futures

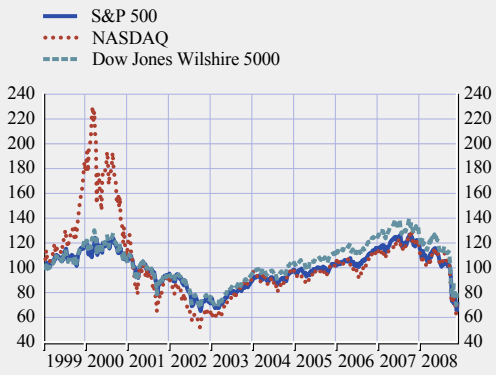
(Jan. 1999 – Nov. 2008; thousands of contracts)



Source: Bloomberg.
Note: Futures traded on the Chicago Board of Trade. Non-commercial futures contracts are contracts bought for purposes other than hedging.

Chart S26 Stock prices in the United States

(Jan. 1999 – Nov. 2008; index: Jan. 1999 = 100)



Source: Bloomberg.

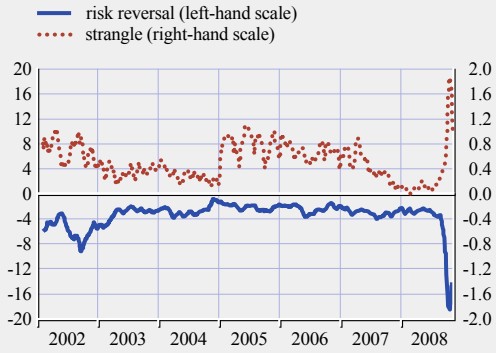
Chart S27 Implied volatility for the S&P 500 index

(Jan. 1999 – Nov. 2008; percentage; CBOE Volatility Index (VIX))

Source: Thomson Financial Datastream.
Note: Data calculated by the Chicago Board Options Exchange (CBOE).

Chart S28 Risk reversal and strangle of the S&P 500 index

(Feb. 2002 – Nov. 2008; percentage; implied volatility; 20-day moving average)



Sources: Bloomberg and ECB calculations.
Note: The risk-reversal indicator is calculated as the difference between the implied volatility of an out-of-the-money (OTM) call with 25 delta and the implied volatility of an OTM put with 25 delta. The strangle is calculated as the difference between the average implied volatility of OTM calls and puts, both with 25 delta, and the average at-the-money volatility of calls and puts with 50 delta.

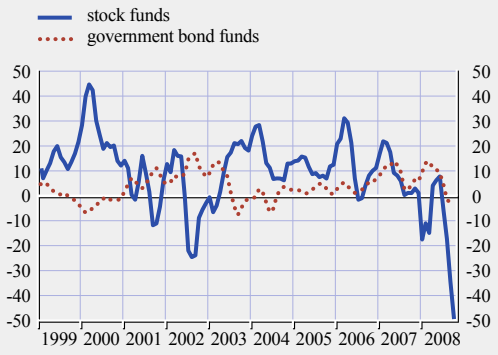
Chart S29 Price/earnings (P/E) ratio for the US stock market

(Jan. 1985 – Oct. 2008; percentage; ten-year trailing earnings)

Sources: Thomson Financial Datastream and ECB calculations.
Note: The P/E ratio is based on prevailing stock prices relative to an average of the previous ten years of earnings.

Chart S30 US mutual fund flows

(Jan. 1999 – Oct. 2008; USD billions; three-month moving average)



Source: Investment Company Institute.

Chart S31 Debit balances in New York Stock Exchange margin accounts

(Jan. 1999 – Oct. 2008; USD billions)

Source: New York Stock Exchange (NYSE).
Note: Borrowing to buy stocks "on margin" allows investors to use loans to pay for up to 50% of a stock's price.

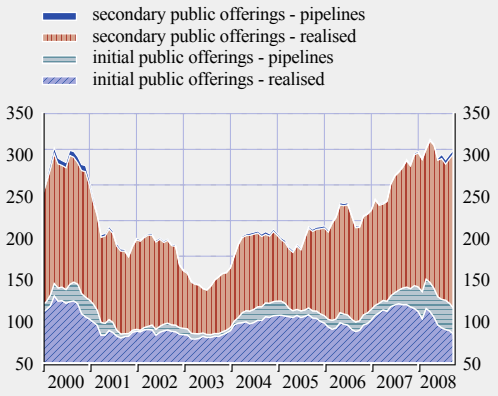
Chart S32 Open interest in options contracts on the S&P 500 index

(Jan. 1999 – Oct. 2008; millions of contracts)

Source: Chicago Board Options Exchange (CBOE).

Chart S33 Gross equity issuance in the United States

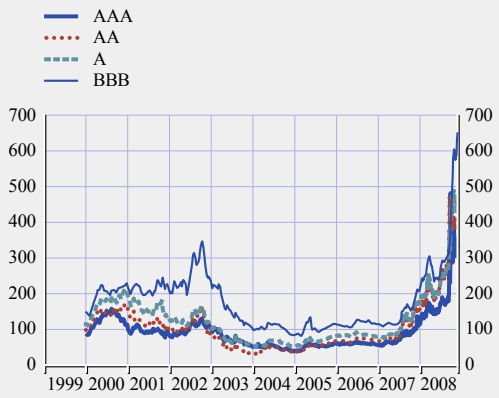
(Jan. 2000 – Oct. 2008; USD billions; 12-month moving sums)



Source: Thomson Financial Datastream.

Chart S34 US investment-grade corporate bond spreads

(Jan. 2000 – Nov. 2008; basis points)



Source: JPMorgan Chase & Co.
Note: Spread between the seven to ten-year yield to maturity and the US seven to ten-year government bond yield.

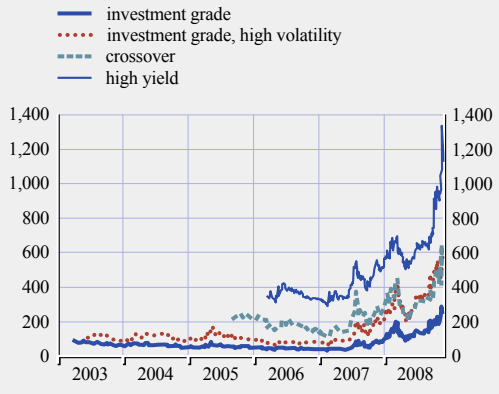
Chart S35 US speculative-grade corporate bond spreads

(Jan. 1999 – Nov. 2008; basis points)

Source: JPMorgan Chase & Co.
Note: The spread is between the yield to maturity of the US domestic high-yield index (BB+ rating or below, average maturity of seven years) and the US five-year government bond yield.

Chart S36 US credit default swap indices

(Apr. 2003 – Nov. 2008; basis points; five-year maturity)



Source: JPMorgan Chase & Co.

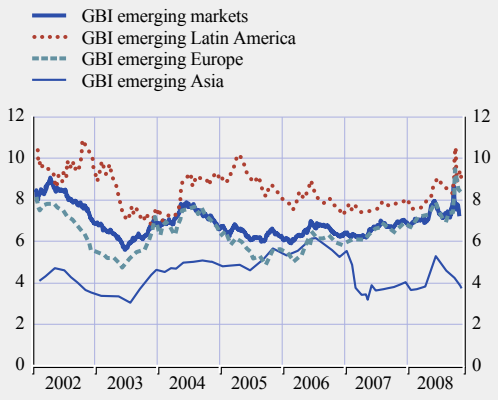
Chart S37 Emerging market sovereign bond spreads

(Jan. 2002 – Nov. 2008; basis points)

Source: JPMorgan Chase & Co.

Chart S38 Emerging market local currency sovereign bond yields

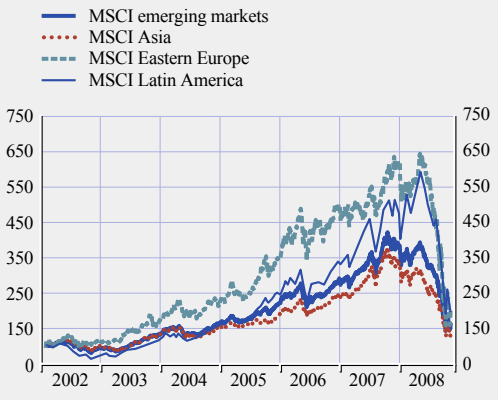
(Jan. 2002 – Nov. 2008; percentage)



Source: JPMorgan Chase & Co.
Note: GBI stands for Government Bond Index.

Chart S39 Emerging market stock price indices

(Jan. 2002 – Nov. 2008; index: Jan. 2002 = 100)



Source: Bloomberg.
Note: MSCI stands for Morgan Stanley Capital International.

Table S3 Total international bond issuance (private and public) in selected emerging markets

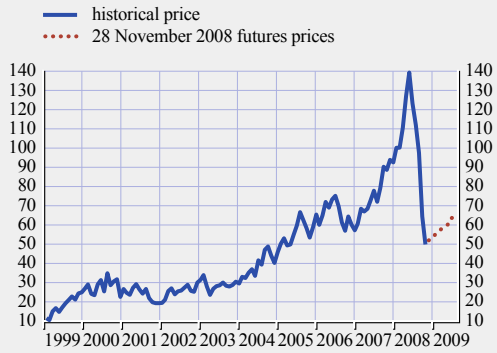
(USD millions)

	2002	2003	2004	2005	2006	2007	2008 Q1-Q3
Asia	**24,410**	**36,975**	**43,198**	**49,256**	**45,656**	**53,744**	**33,905**
of which							
South Korea	8,790	9,718	15,133	15,786	15,976	20,787	12,410
Hong Kong	1,012	12,000	4,024	5,272	5,199	4,714	3,507
Singapore	378	3,300	5,596	5,402	4,239	3,772	2,077
India	-	300	3,188	1,192	2,369	9,181	1,408
China	743	2,284	4,625	3,617	1,504	2,652	2,112
Malaysia	4,870	877	3,463	2,858	2,543	918	440
Thailand	-	300	1,396	1,783	1,721	761	524
Latin America	**17,956**	**31,042**	**31,407**	**33,977**	**33,538**	**42,665**	**17,765**
of which							
Brazil	5,590	10,082	9,381	13,245	17,077	10,953	7,408
Mexico	5,548	11,417	11,220	6,913	5,838	10,908	3,824
Venezuela	1,042	4,393	4,440	6,066	731	10,078	4,921
Colombia	488	1,292	1,341	2,201	3,293	3,682	1,097
Chile	1,297	991	1,299	-	895	518	100
Argentina	-	-	-	299	1,450	1,980	-
Emerging Europe	**8,745**	**16,688**	**25,660**	**28,690**	**37,419**	**42,597**	**26,971**
of which							
Russian Federation	3,317	8,579	16,333	17,075	25,148	33,458	21,434
Ukraine	403	1,250	2,058	1,718	2,597	3,000	110
Croatia	640	538	1,096	-	385	742	-

Source: Dealogic (DCM Analytics).
Note: Regions are defined as follows. Asia: Brunei, Burma, China, Special Administrative Region of Hong Kong, India, Indonesia, Laos, Macau, Malaysia, Nauru, North Korea, the Philippines, Samoa, Singapore, South Korea, Taiwan, Thailand and Vietnam. Emerging Europe: Bulgaria, Croatia, Romania, Russia, Turkey and Ukraine. Latin America: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Uruguay and Venezuela.

Chart S40 Oil price and oil futures prices

(Jan. 1999 – Oct. 2009; USD per barrel)



Source: Bloomberg.

Chart S41 Crude oil futures contracts

(Jan. 1999 – Nov. 2008; thousands of contracts)

Source: Bloomberg.
Note: Futures traded on the New York Mercantile Exchange. Non-commercial futures contracts are contracts bought for purposes other than hedging.

Chart S42 Precious metal prices

(Jan. 1999 – Nov. 2008; index: Jan. 1999 = 100)

Source: Bloomberg.
Note: The indices are based on prices in US dollars.

3 EURO AREA ENVIRONMENT

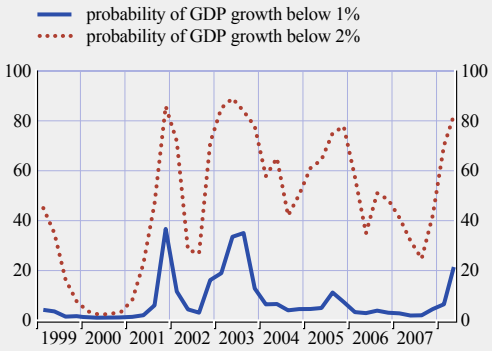
Chart S43 Real GDP growth in the euro area

(Q1 1999 – Q3 2008; percentage change per annum)

Source: Eurostat.

Chart S44 Survey-based estimates of the four-quarter-ahead downside risk of weak real GDP growth in the euro area

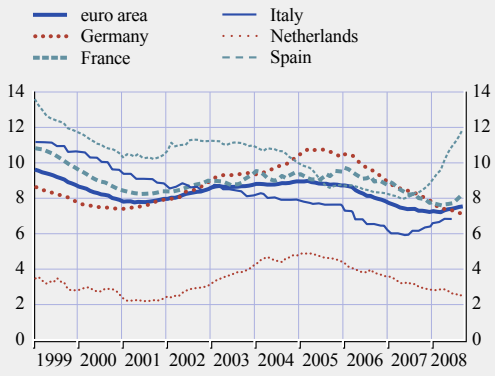
(Q1 1999 – Q2 2008; percentage)



Sources: ECB Survey of Professional Forecasters (SPF) and ECB calculations.
Note: The indicators measure the percentage of the probability distribution for real GDP growth expectations over the following year below the indicated threshold.

Chart S45 Unemployment rate in the euro area and in selected euro area countries

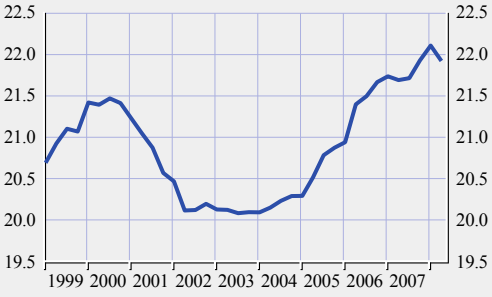
(Jan 1999 – Sep. 2008; percentage)



Source: Eurostat.

Chart S46 Gross fixed capital formation in the euro area

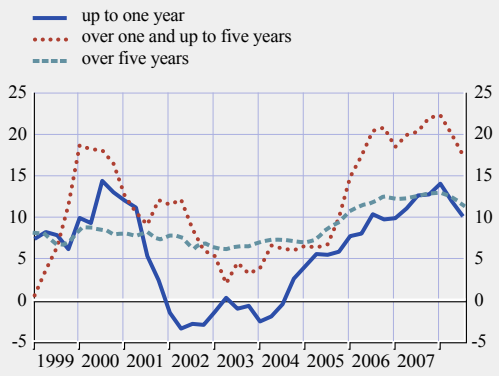
(Q1 1999 – Q2 2008; percentage of GDP)



Source: Eurostat.

Chart S47 Annual growth in MFI loans to non-financial corporations in the euro area for selected maturities

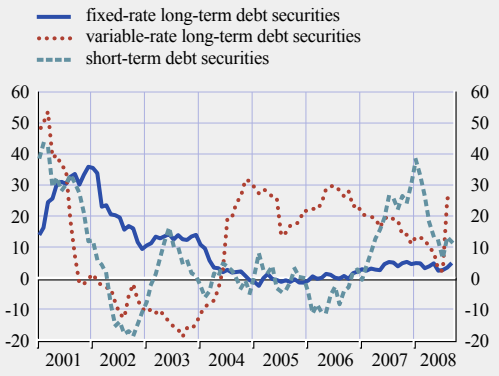
(Q1 1999 – Q3 2008; percentage change per annum)



Source: ECB.
Note: Data are based on financial transactions of monetary financial institution (MFI) loans.

Chart S48 Annual growth in debt securities issued by non-financial corporations in the euro area

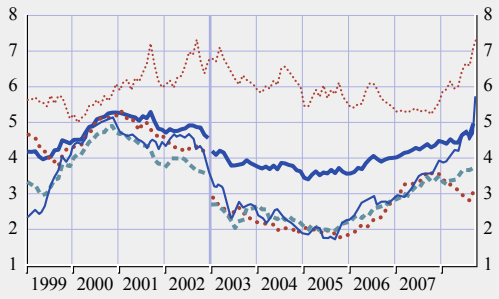
(Jan. 2001 – Sep. 2008; percentage change per annum; outstanding amounts)



Source: ECB.

Chart S49 Real cost of the external financing of euro area non-financial corporations

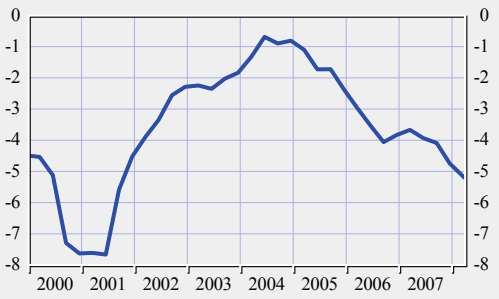
(Jan. 1999 – Oct. 2008; percentage)



Sources: ECB, Thomson Financial Datastream, Merrill Lynch, Consensus Economics forecast and ECB calculations.
Note: The real cost of external financing is calculated as the weighted average of the cost of bank lending, the cost of debt securities and the cost of equity, based on their respective amounts outstanding and deflated by inflation expectations. The introduction of MFI interest rate statistics at the beginning of 2003 led to a statistical break in the series.

Chart S50 Net lending/borrowing of non-financial corporations in the euro area

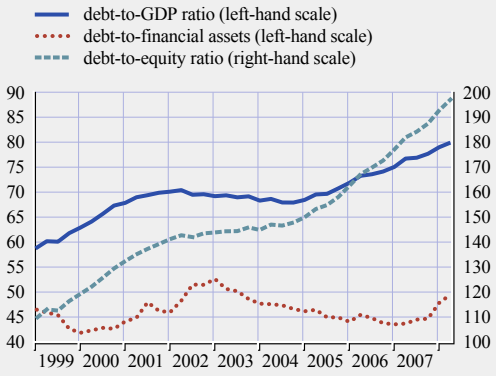
(Q1 2000 – Q2 2008; percentage of the gross value added of non-financial corporations; four-quarter moving sum)



Sources: ECB and ECB calculations.

Chart S51 Total debt of non-financial corporations in the euro area

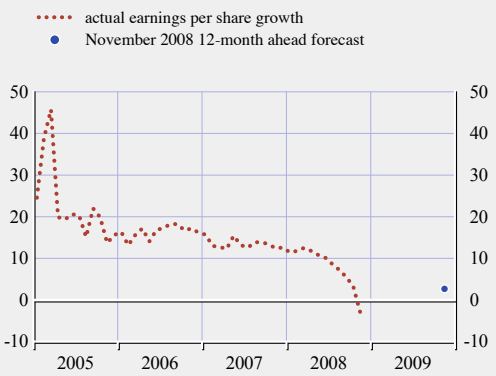
(Q1 1999 – Q2 2008; percentage)



Sources: ECB and ECB calculations.
Note: Data for the last quarter are partly based on estimates. The debt-to-equity ratio is calculated as a percentage of outstanding quoted shares issued by non-financial corporations, excluding the effect of valuation changes.

Chart S52 Earnings per share (EPS) growth and 12-month ahead growth forecast for euro area non-financial corporations

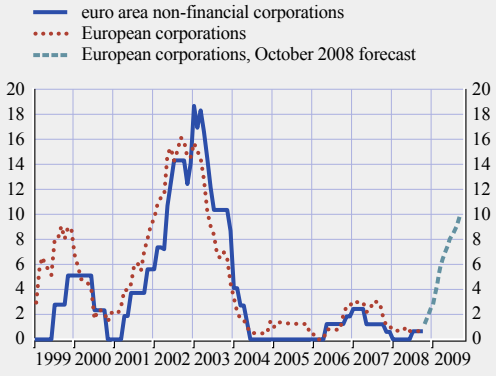
(Jan. 2005 – Nov. 2009; percentage change per annum)



Sources: Thomson Financial Datastream and ECB calculations.

Chart S53 Euro area and European speculative-grade-rated corporations' default rates and forecast

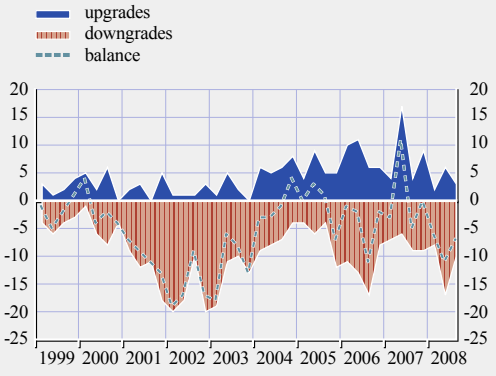
(Jan. 1999 – Oct. 2009; percentage; 12-month trailing sum)



Source: Moody's.

Chart S54 Euro area non-financial corporations' rating changes

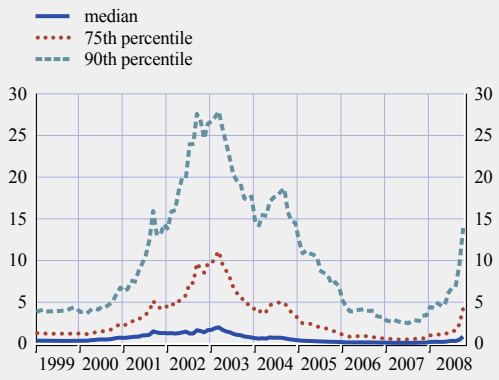
(Q1 1999 – Q3 2008; number)



Source: Moody's.

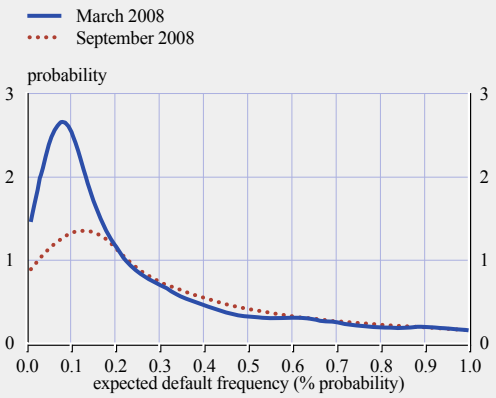
Chart S55 Expected default frequency (EDF) of euro area non-financial corporations

(Jan. 1999 – Oct. 2008; percentage probability)



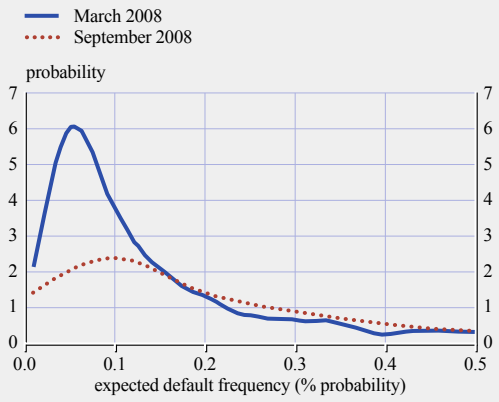
Sources: Moody's KMV and ECB calculations.
Note: The EDF provides an estimate of the probability of default over the following year. Due to measurement considerations, the EDF values are restricted by Moody's KMV to the interval between 0.01% and 35%.

Chart S56 Expected default frequency (EDF) distributions for non-financial corporations



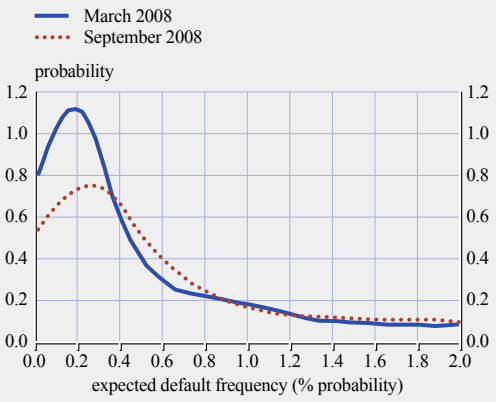
Sources: Moody's KMV and ECB calculations.
Note: The EDF provides an estimate of the probability of default over the following year.

Chart S57 Expected default frequency (EDF) distributions for large euro area non-financial corporations



Sources: Moody's KMV and ECB calculations.
Note: The EDF provides an estimate of the probability of default over the following year. The size is determined by the quartiles of the value of liabilities: it is large if in the upper quartile of the distribution.

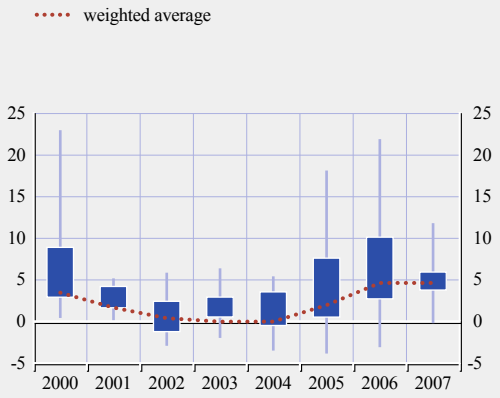
Chart S58 Expected default frequency (EDF) distributions for small euro area non-financial corporations



Sources: Moody's KMV and ECB calculations.
Note: The EDF provides an estimate of the probability of default over the following year. The size is determined by the quartiles of the value of liabilities: it is small if in the lower quartile of the distribution.

Chart S59 Euro area country distributions of commercial property price changes

(2000 – 2007; capital values; percentage change per annum; minimum, maximum and interquartile distribution of country-level data)



Sources: Investment Property Databank and ECB calculations.
Note: The data cover ten euro area countries. The coverage of the total property sector within countries ranges from around 20% to 80%.

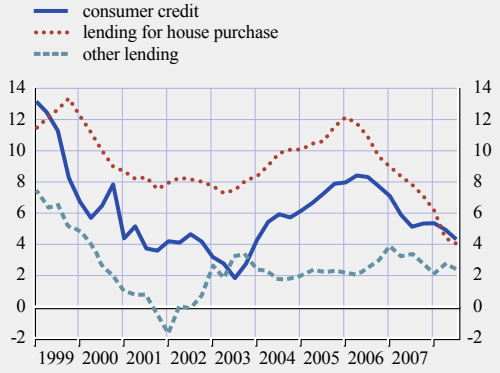
Chart S60 Euro area commercial property price changes in different sectors

(2000 – 2007; capital values; percentage change per annum)

Sources: Investment Property Databank and ECB calculations.
Note: The data cover ten euro area countries. The coverage of the total property sector within countries ranges from around 20% to 80%.

Chart S61 Annual growth in MFI loans to households in the euro area

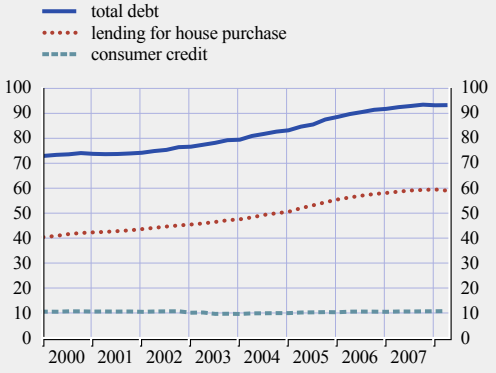
(Q1 1999 – Q3 2008; percentage change per annum)



Source: ECB.
Note: Data are based on financial transactions of MFI loans.

Chart S62 Household debt-to-disposable income ratios in the euro area

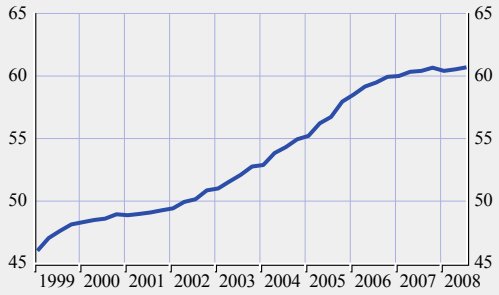
(Q1 2000 – Q2 2008; percentage of disposable income)



Source: ECB.
Note: These series are the four-quarter moving sums of their raw series divided by the disposable income for the respective quarter.

Chart S63 Household debt-to-GDP ratios in the euro area

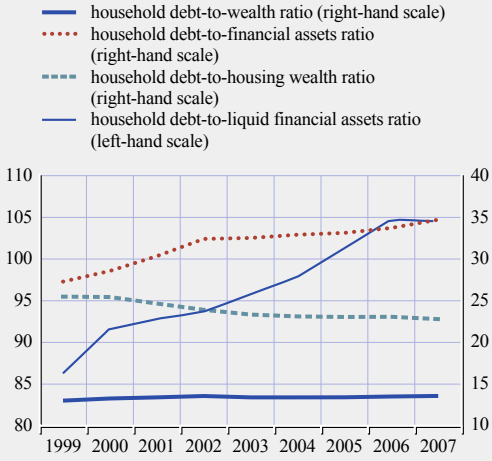
(Q1 1999 – Q3 2008; percentage)



Sources: ECB and Eurostat.

Chart S64 Household debt-to-assets ratios in the euro area

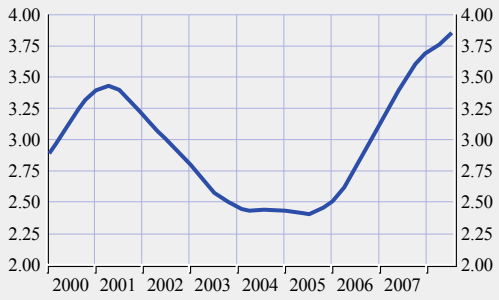
(1999 – 2007; percentage)



Source: ECB.
Note: Data for 2006 and 2007 are based on estimates. Household debt comprises total loans to households from all institutional sectors, including the rest of the world. Interest payments do not include the full financing costs paid by households, as they exclude the fees for financial services.

Chart S65 Interest payment burden of the euro area household sector

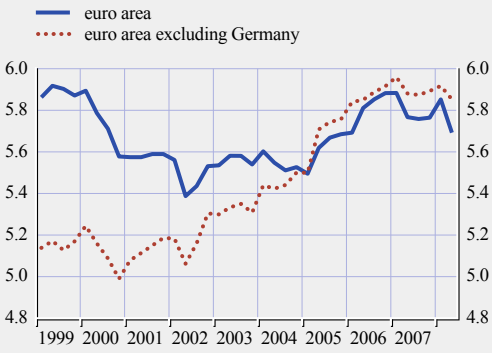
(Q1 2000 – Q3 2008; percentage of disposable income)



Sources: ECB and ECB calculations.

Chart S66 Residential investment in the euro area

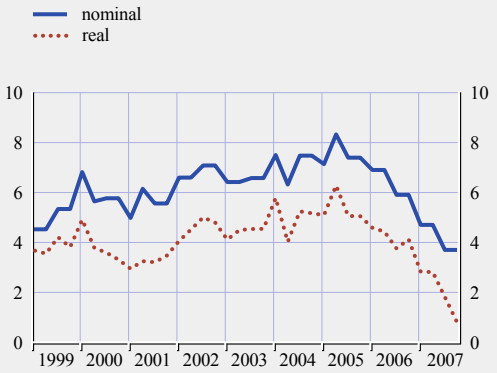
(Q1 1999 – Q2 2008; percentage of GDP)



Sources: ECB, Eurostat and ECB calculations.

Chart S67 Residential property price changes in the euro area

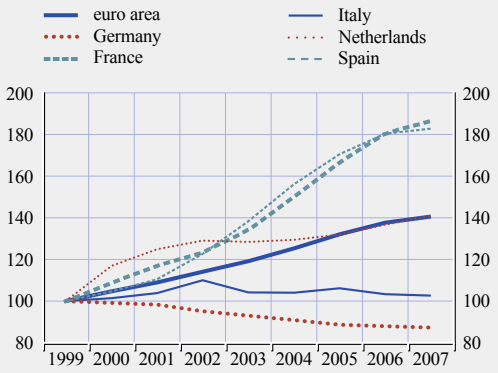
(Q1 1999 – Q4 2007; percentage change per annum)



Sources: National sources and ECB calculations.
Note: The real price series has been deflated by the Harmonised Index of Consumer Prices (HICP).

Chart S68 House price-to-rent ratio for the euro area and selected euro area countries

(1999 – 2007; index: 1999 = 100)



Source: ECB.

Table S4 Residential property price changes in euro area countries

(percentage change per annum)

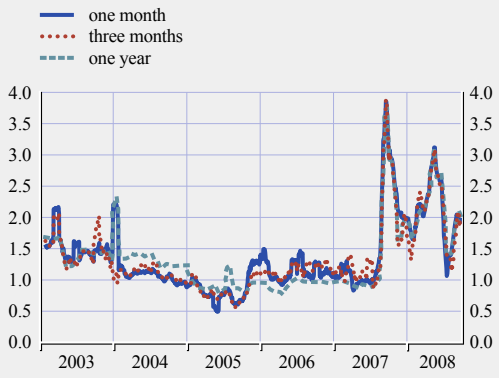
	2001	2002	2003	2004	2005	2006	2007	2006		2007		2008	2007				2008		
								H1	H2	H1	H2	H1	Q1	Q2	Q3	Q4	Q1	Q2	Q3
Belgium [1]	6.2	7.8	7.1	12.0	16.7	11.1	9.2	12.4	9.9	9.3	9.1	..	9.1	9.4	10.3	7.9	..	..	..
Germany [2]	0.2	-1.9	-1.2	-1.4	-1.5	0.3	0.3	..	..	..	..	..	..	..	..	..	..	..	..
Ireland [2]	14.0	6.1	14.3	11.5	7.2	13.4	0.9	12.7	14.1	6.0	-3.9	-9.0	9.2	2.9	-1.8	-6.0	-8.6	-9.4	-10.0
Greece [2]	14.4	13.9	5.4	2.3	10.9	12.2	..	13.0	11.4	5.2	2.1	..	7.1	3.3	2.5	1.8	..	..	..
Spain [2]	9.9	15.7	17.6	17.4	13.9	10.4	5.8	11.4	9.5	6.5	5.1	2.9	7.2	5.8	5.3	4.8	3.8	2.0	..
France [1]	7.9	8.3	11.7	15.2	15.3	12.1	6.6	13.9	10.5	7.5	5.7	3.5	8.1	6.8	5.7	5.7	4.3	2.8	..
Italy [2]	6.0	12.6	7.2	7.0	8.6	5.8	5.0	6.0	5.6	5.5	4.4	5.2	..	..	..	..	..	..	..
Cyprus [2]	..	..	8.0	20.0	12.0	10.0	15.0	..	..	..	..	..	..	..	..	..	..	..	..
Luxembourg [2]	11.4	10.8	11.5	14.0	11.7	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Malta [2]	5.0	8.7	13.3	20.3	9.8	3.5	1.1	5.8	1.4	1.6	0.6	-1.7	3.1	0.2	1.1	0.1	-0.7	-2.7	-3.2
Netherlands [1]	11.1	6.4	3.6	4.3	3.9	4.6	4.2	4.6	4.6	4.1	4.3	3.7	4.1	4.1	4.4	4.3	4.2	3.1	..
Austria [2]	2.2	0.2	0.3	-2.2	5.1	4.0	4.1	4.1	4.0	3.9	4.2	..	3.5	4.4	4.8	3.6	2.1	..	..
Portugal [2]	5.4	0.6	1.1	0.6	2.3	2.1	1.3	3.4	0.8	1.2	1.5	3.1	1.3	1.1	1.3	1.7	2.3	4.0	4.8
Finland [1]	-0.5	7.4	6.3	7.3	6.1	7.4	5.9	8.3	6.6	6.4	5.5	3.2	6.4	6.4	6.0	4.9	3.9	2.4	..
euro area	5.8	7.0	7.0	7.5	7.7	6.5	4.5	6.9	5.9	4.8	3.9	..	..	..	..	..	..	..	..

Sources: National sources and ECB calculations.
Note: Weights are based on 2007 nominal GDP. The estimates of the euro area aggregate for the first and second halves of a year are partially based on the interpolation of annual data.
1) Existing dwellings (houses and flats); whole country.
2) All dwellings (new and existing houses and flats); whole country.

4 EURO AREA FINANCIAL MARKETS

Chart S69 Bid-ask spreads for EONIA swap rates

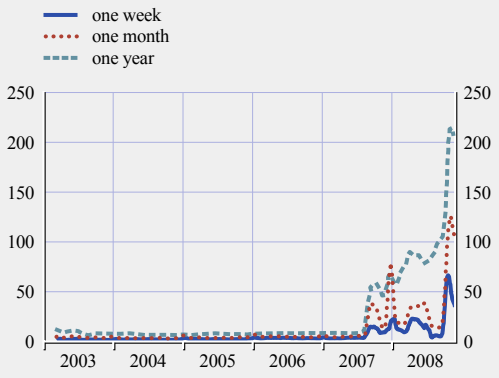
(Jan. 2003 – Sep. 2008; basis points; 20-day moving average; transaction-weighted)



Source: e-MID.
Note: Data from mid-September 2008 are missing due to insufficient trading activity on the e-MID electronic platform.

Chart S70 Euro area spreads between interbank deposit and repo interest rates

(Mar. 2003 – Nov. 2008; basis points; 20-day moving average)



Source: ECB.

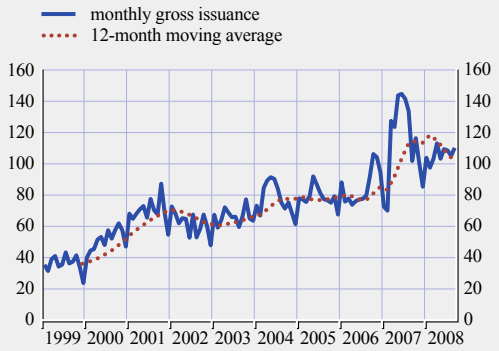
Chart S71 Implied volatility of three-month EURIBOR futures

(Apr. 1999 – Nov. 2008; percentage; 60-day moving average)

Source: Bloomberg.

Chart S72 Monthly gross issuance of short-term securities (other than shares) by euro area non-financial corporations

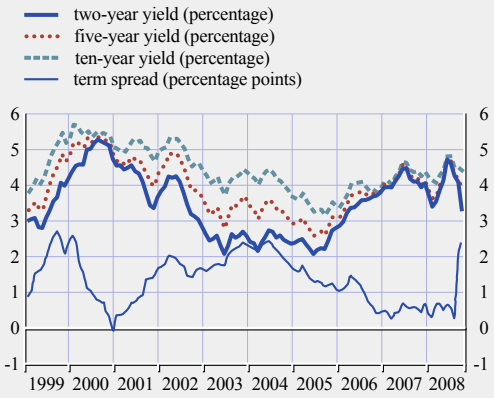
(Jan. 1999 – Sep. 2008; EUR billions; maturities up to one year)



Source: ECB.

Chart S73 Euro area government bond yields and term spread

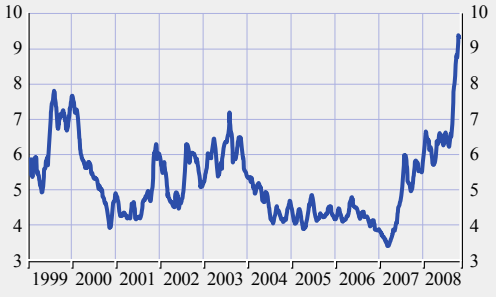
(Jan. 1999 – Oct. 2008)



Sources: ECB and Bloomberg.
Note: The term spread is the difference between the ten-year bond yield and the three-month T-bill yield.

Chart S74 Option-implied volatility for ten-year government bond yields in Germany

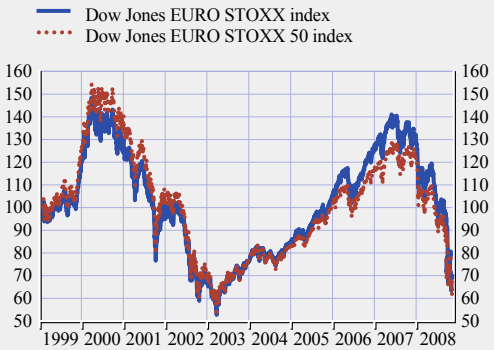
(Jan. 1999 – Nov. 2008; percentage; implied volatility; 20-day moving average)



Source: Bloomberg.

Chart S75 Stock prices in the euro area

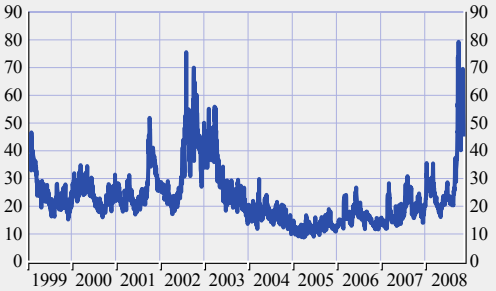
(Jan. 1999 – Nov. 2008; index: Jan. 1999 = 100)



Source: Bloomberg.

Chart S76 Implied volatility for the Dow Jones EURO STOXX 50 index

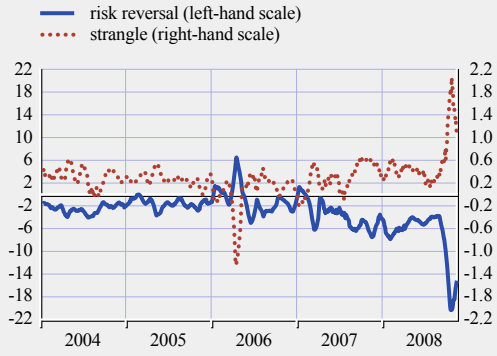
(Jan. 1999 – Nov. 2008; percentage)



Source: Bloomberg.

Chart S77 Risk reversal and strangle of the Dow Jones EURO STOXX 50 index

(Jan. 2004 – Nov. 2008; percentage; implied volatility; 20-day moving average)



Sources: Bloomberg and ECB calculations.
Note: The risk-reversal indicator is calculated as the difference between the implied volatility of an out-of-the-money (OTM) call with 25 delta and the implied volatility of an OTM put with 25 delta. The "strangle" is calculated as the difference between the average implied volatility of OTM calls and puts, both with 25 delta, and the average at-the-money volatility of calls and puts with 50 delta.

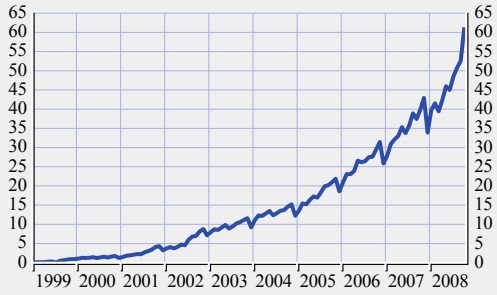
Chart S78 Price/earnings (P/E) ratio for the euro area stock market

(Jan. 1985 – Oct. 2008; percentage; ten-year trailing earnings)

Sources: Thomson Financial Datastream and ECB calculations.
Note: The P/E ratio is based on prevailing stock prices relative to an average of the previous ten years of earnings.

Chart S79 Open interest in option contract on the Dow Jones EURO STOXX 50 index

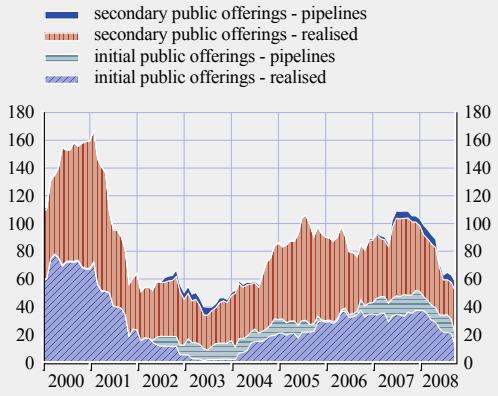
(Jan. 1999 – Oct. 2008; millions of contracts)



Source: Eurex.

Chart S80 Gross equity issuance and pipeline deals in the euro area

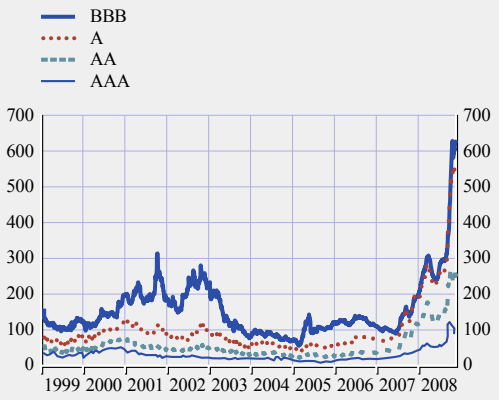
(Jan. 2000 – Oct. 2008; EUR billions; 12-month moving sums)



Source: Thomson Financial Datastream.

Chart S81 Investment-grade corporate bond spreads in the euro area

(Jan. 1999 – Nov. 2008; basis points)



Source: Thomson Financial Datastream.
Note: Spread between the seven to ten-year yield to maturity and the euro area seven to ten-year government bond yield.

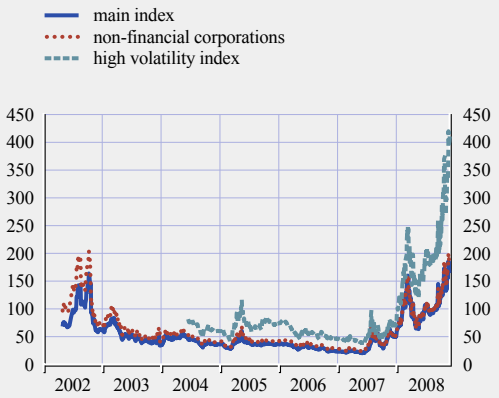
Chart S82 Speculative-grade corporate bond spreads in the euro area

(Jan. 1999 – Nov. 2008; basis points)

Source: JPMorgan Chase & Co.
Note: Spread between the yield to maturity of the euro area high-yield index (BB+ rating or below, average maturity of 5.9 years) and the euro area five-year government bond yield.

Chart S83 iTraxx Europe five-year credit default swap indices

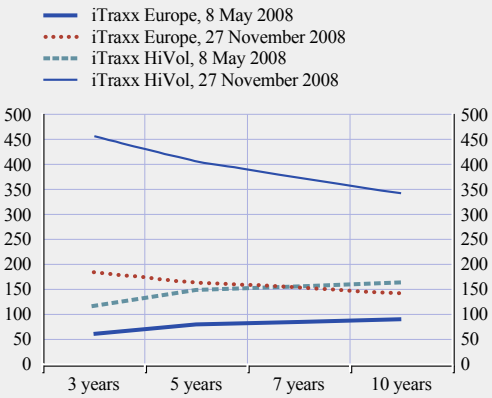
(May 2002 – Nov. 2008; basis points)



Source: JPMorgan Chase & Co.

Chart S84 Term structures of premiums for iTraxx Europe and HiVol

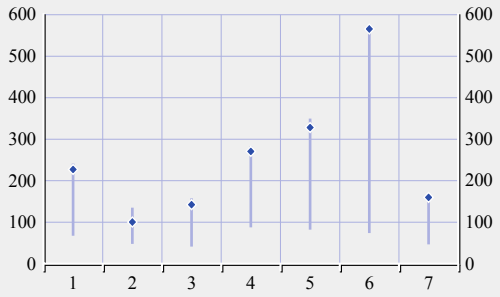
(basis points)



Source: JPMorgan Chase & Co.

Chart S85 iTraxx sector indices

(May 2008 – Nov. 2008; basis points)



1 main index
2 financials
3 energy
4 consumer
5 industrials
6 autos
7 TMT

Source: Bloomberg.
Note: The diamonds show the most recent observation and the bars show the range of variation over the six months to the most recent daily observation.

5 EURO AREA FINANCIAL INSTITUTIONS

Table S5 Financial condition of large and complex banking groups in the euro area

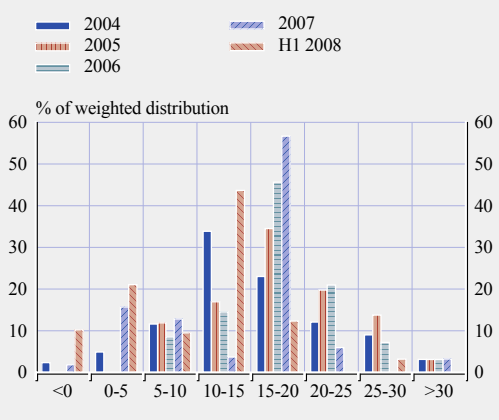
(2004 – H1 2008)

	Min.	1st quartile	Median	Average	*Weighted average*	3rd quartile	Max.
Return on equity (%)*							
2004	-25.07	10.04	13.30	13.21	*14.46*	18.00	33.20
2005	9.00	11.85	15.90	17.07	*17.61*	20.00	37.00
2006	7.24	13.72	17.70	17.82	*16.70*	19.93	37.60
2007	-28.63	7.10	15.40	11.40	*12.60*	17.00	34.25
H1 2008	-23.80	3.00	10.90	7.87	*8.68*	14.10	25.30
Return on risk-weighted assets (%)*							
2004	-1.22	0.46	1.00	0.90	*1.02*	1.38	2.03
2005	0.33	0.90	1.15	1.19	*1.28*	1.53	2.26
2006	0.35	0.89	1.29	1.33	*1.42*	1.67	2.66
2007	-1.53	0.58	0.90	0.95	*1.12*	1.59	2.29
H1 2008	-1.96	0.32	1.00	0.73	*0.84*	1.38	2.32
Net interest income (% total assets)							
2004	0.43	0.61	0.75	0.97	*0.91*	1.28	1.90
2005	0.45	0.55	0.61	0.88	*0.87*	1.27	1.87
2006	0.24	0.54	0.66	0.88	*0.87*	1.17	2.03
2007	0.13	0.48	0.65	0.86	*0.84*	1.19	1.97
H1 2008	0.09	0.60	0.66	0.97	*0.95*	1.39	2.25
Net interest income (% total income)							
2004	24.33	43.50	54.71	53.15	*49.79*	65.49	74.66
2005	24.14	41.53	55.31	51.73	*48.35*	61.08	73.60
2006	14.47	37.66	46.53	47.92	*45.09*	57.52	70.24
2007	13.24	46.96	56.52	70.56	*46.96*	64.10	392.09
H1 2008	12.43	47.86	60.01	60.45	*54.90*	66.82	127.88
Net trading income (% total income)							
2004	-1.28	4.63	8.29	10.89	*13.44*	15.65	29.05
2005	0.52	5.93	8.98	12.50	*14.57*	18.65	38.09
2006	2.45	6.75	13.21	15.59	*18.25*	21.67	48.19
2007	-581.29	-0.94	9.24	-18.44	*16.15*	15.41	46.76
H1 2008	-80.99	-5.92	6.15	3.40	*8.97*	21.13	42.87
Fees and commissions (% total income)							
2004	11.55	20.36	29.34	28.11	*30.86*	35.28	44.64
2005	13.46	18.88	26.91	27.34	*30.49*	35.01	44.13
2006	14.87	20.66	27.51	27.18	*29.54*	33.50	43.69
2007	18.92	24.91	31.23	36.23	*31.43*	36.92	146.04
H1 2008	10.70	21.14	24.73	29.39	*28.88*	33.26	82.12
Other income (% total income)							
2004	-3.24	2.65	5.91	7.85	*5.91*	10.75	26.70
2005	-0.76	2.92	4.83	8.43	*6.60*	11.41	40.52
2006	-0.16	2.68	6.04	9.31	*7.12*	12.40	43.97
2007	0.00	1.90	5.07	11.65	*5.46*	8.79	143.17
H1 2008	-18.92	2.46	5.64	6.76	*7.25*	11.70	24.19
Net loan impairment charges (% total assets)							
2004	0.03	0.05	0.07	0.11	*0.10*	0.13	0.40
2005	0.00	0.02	0.05	0.09	*0.08*	0.12	0.29
2006	0.01	0.03	0.06	0.10	*0.09*	0.09	0.36
2007	0.01	0.03	0.06	0.11	*0.11*	0.10	0.39
H1 2008	0.01	0.06	0.08	0.18	*0.17*	0.23	0.91
Cost-to-income ratio (%)*							
2004	44.40	55.90	67.00	64.61	*66.37*	70.90	85.30
2005	43.20	54.80	62.30	63.24	*63.47*	66.90	89.93
2006	39.60	54.80	61.10	61.38	*61.47*	68.00	92.37
2007	41.30	55.60	64.20	63.63	*63.72*	69.60	89.40
H1 2008	40.10	54.48	63.75	78.49	*78.62*	90.35	162.80
Tier 1 ratio (%)*							
2004	6.50	7.16	7.90	8.08	*8.04*	8.33	10.90
2005	6.70	7.60	8.10	8.32	*8.19*	8.80	11.60
2006	6.70	7.42	7.80	8.26	*8.12*	8.73	10.50
2007	6.50	7.32	8.05	8.03	*7.94*	8.68	10.70
H1 2008	6.40	7.60	8.15	8.28	*8.27*	8.80	11.40
Overall solvency ratio (%)*							
2004	8.50	10.80	11.77	11.59	*11.32*	12.50	13.30
2005	8.50	10.50	11.10	11.61	*11.37*	12.46	16.30
2006	10.00	10.60	11.10	11.44	*11.35*	12.00	15.60
2007	8.80	9.80	10.56	10.70	*10.64*	11.28	13.80
H1 2008	9.50	10.80	11.30	11.40	*11.28*	11.92	14.40

Sources: Individual institutions' financial reports and ECB calculations.
Note: Based on figures for 21 IFRS-reporting large and complex banking groups in the euro area, * – weighted by total assets.

Chart S86 Frequency distribution of return on equity (ROE) for large and complex banking groups in the euro area

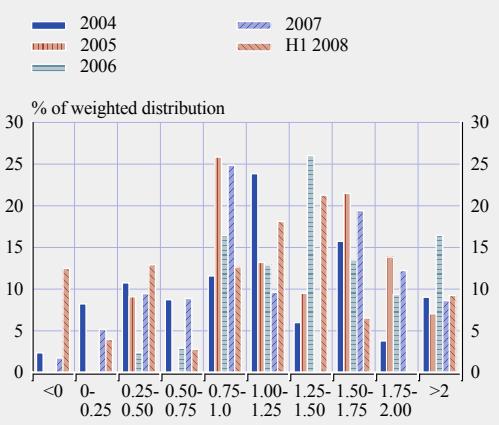
(2004 – H1 2008; percentage)



Sources: Individual institutions' financial reports and ECB calculations.
Note: Distribution weighted by total assets. Based on figures for 21 IFRS-reporting large and complex banking groups in the euro area.

Chart S87 Frequency distribution of return on risk-weighted assets for large and complex banking groups in the euro area

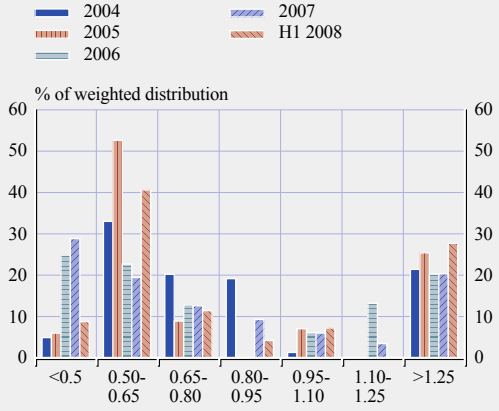
(2004 – H1 2008; percentage)



Sources: Individual institutions' financial reports and ECB calculations.
Note: Distribution weighted by total assets. Based on figures for 21 IFRS-reporting large and complex banking groups in the euro area.

Chart S88 Frequency distribution of net interest income for large and complex banking groups in the euro area

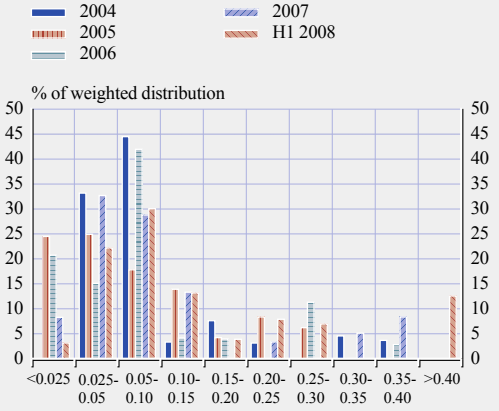
(2004 – H1 2008; percentage of total assets)



Sources: Individual institutions' financial reports and ECB calculations.
Note: Distribution weighted by total assets. Based on figures for 21 IFRS-reporting large and complex banking groups in the euro area.

Chart S89 Frequency distribution of net loan impairment charges for large and complex banking groups in the euro area

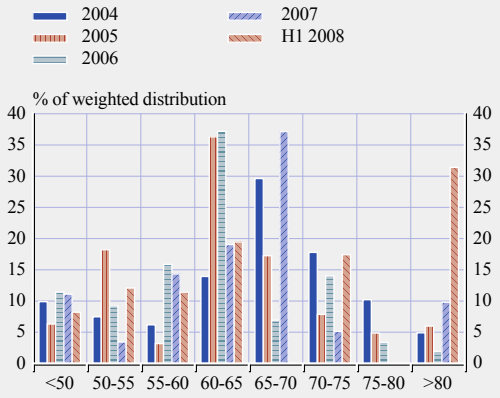
(2004 – H1 2008; percentage of total assets)



Sources: Individual institutions' financial reports and ECB calculations.
Note: Distribution weighted by total assets. Based on figures for 21 IFRS-reporting large and complex banking groups in the euro area.

Chart S90 Frequency distribution of cost-to-income ratios for large and complex banking groups in the euro area

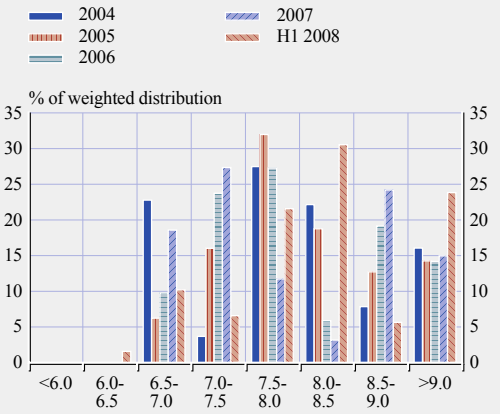
(2004 – H1 2008; percentage)



Sources: Individual institutions' financial reports and ECB calculations.
Note: Distribution weighted by total assets. Based on figures for 21 IFRS-reporting large and complex banking groups in the euro area.

Chart S91 Frequency distribution of Tier 1 ratios for large and complex banking groups in the euro area

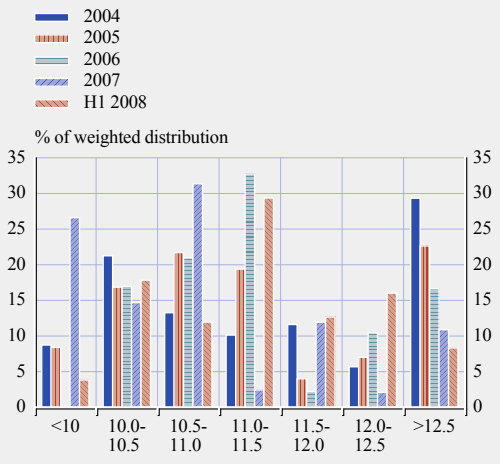
(2004 – H1 2008; percentage)



Sources: Individual institutions' financial reports and ECB calculations.
Note: Distribution weighted by total assets. Based on figures for 21 IFRS-reporting large and complex banking groups in the euro area.

Chart S92 Frequency distribution of overall solvency ratios for large and complex banking groups in the euro area

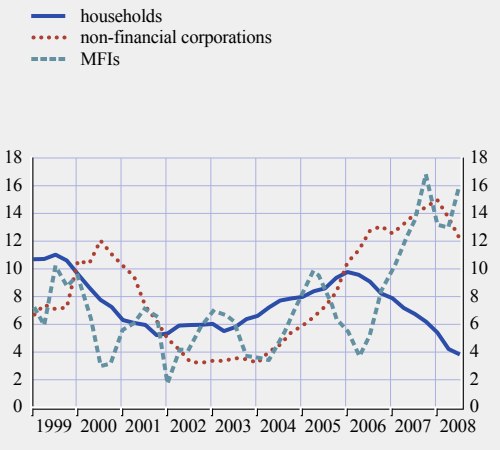
(2004 – H1 2008; percentage)



Sources: Individual institutions' financial reports and ECB calculations.
Note: Distribution weighted by total assets. Based on figures for 21 IFRS-reporting large and complex banking groups in the euro area.

Chart S93 Annual growth in euro area MFI loans extended by sector

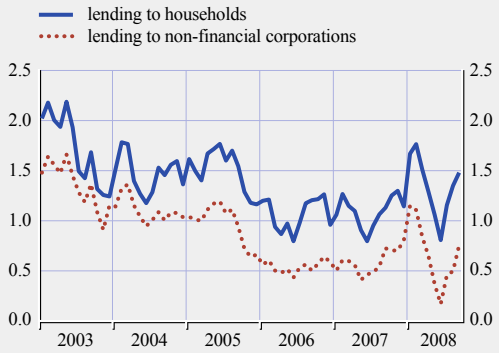
(Q1 1999 – Q3 2008; percentage change per annum)



Source: ECB.
Note: Data are based on financial transactions of MFI loans.

Chart S94 Lending margins of euro area MFIs

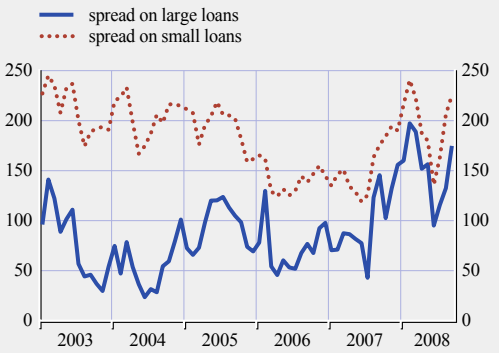
(Jan. 2003 – Sep. 2008; percentage points)



Source: ECB.
Note: The weighted lending margins are the difference between the interest rate on new lending and the interest rate swap rate, where both have corresponding initial rate fixations/maturities.

Chart S95 Euro area MFI loan spreads

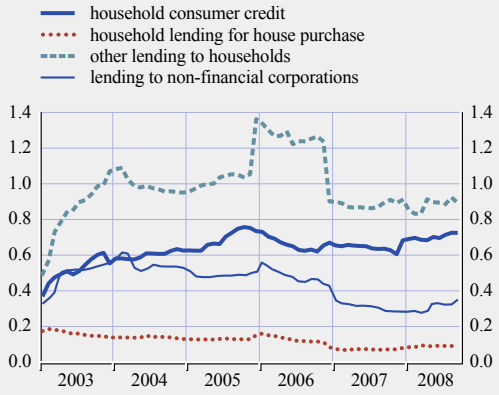
(Jan. 2003 – Sep. 2008; basis points)



Source: ECB.
Note: The spread is between the rate on loans to non-financial corporations with initial rate fixation of one to five years and the three-year government bond yield, for small (below €1 million) and large (above €1 million) loans respectively.

Chart S96 Write-off rates on euro area MFI loans

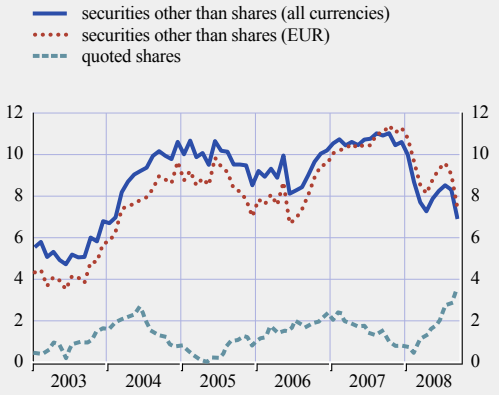
(Jan 2003 – Sep. 2008; 12-month moving sums; percentage of the outstanding amount of loans)



Source: ECB.

Chart S97 Annual growth in euro area MFI issuance of securities and shares

(Jan. 2003 – Sep. 2008; percentage change per annum)



Source: ECB.

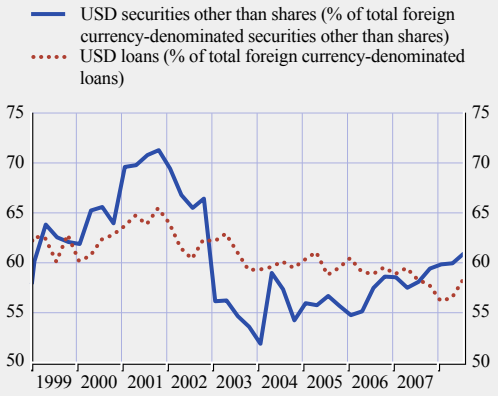
Chart S98 Deposit margins of euro area MFIs

(Jan. 2003 – Sep. 2008; percentage points)

Source: ECB.
Note: The weighted deposit margins are the difference between the interest rate swap rate and the deposit rate, where both have corresponding initial rate fixations/maturities.

Chart S99 Euro area MFI foreign currency-denominated assets, selected balance sheet items

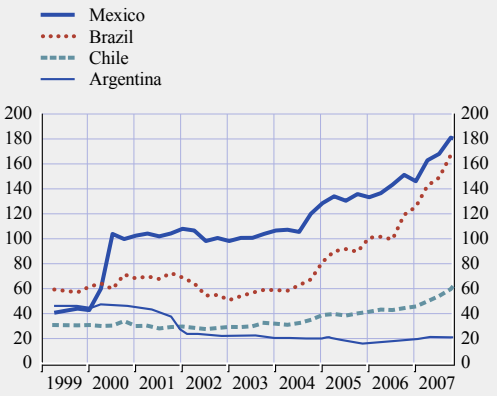
(Q1 1999 – Q3 2008)



Source: ECB.

Chart S100 International exposure of euro area banks to Latin American countries

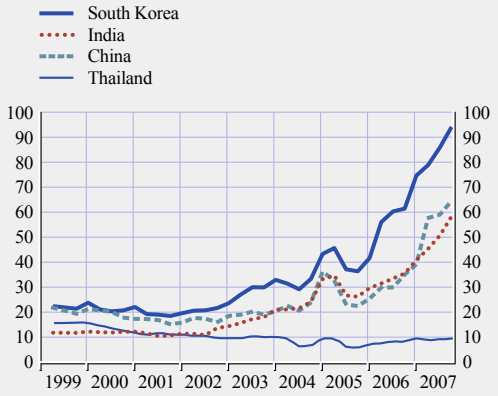
(Q2 1999 – Q1 2008; USD billions)



Source: BIS.

Chart S101 International exposure of euro area banks to Asian countries

(Q2 1999 – Q1 2008; USD billions)



Source: BIS.

Table S6 Euro area consolidated foreign claims of reporting banks on individual countries

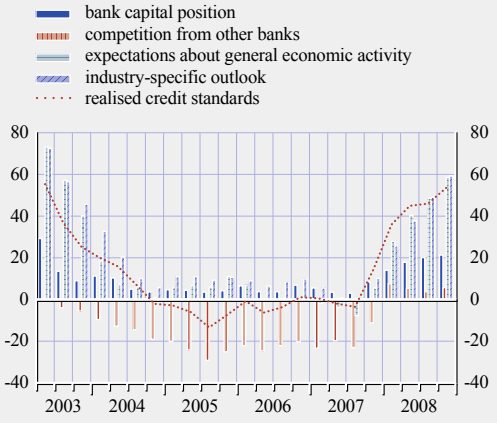
(USD billions)

	2005				2006				2007				2008
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
Total all countries	**6,228.1**	**6,429.2**	**6,088.2**	**5,888.9**	**6,427.4**	**6,867.2**	**7,069.6**	**7,617.4**	**8,525.6**	**9,015.2**	**9,256.3**	**9,499.3**	**10,225.2**
Total non-developed countries (incl. offshore centres)	**1,848.5**	**1,966.3**	**1,600.0**	**1,574.7**	**1,688.2**	**1,804.2**	**1,870.5**	**2,073.2**	**2,301.3**	**2,532.1**	**2,754.0**	**3,048.3**	**3,279.9**
Hong Kong	45.2	58.0	54.2	46.9	44.9	56.1	54.8	54.9	53.5	54.6	56.8	57.9	72.7
Singapore	49.5	53.2	39.7	38.2	43.3	46.4	52.9	45.0	53.1	71.7	60.4	64.3	73.7
Total offshore centres	**599.2**	**622.9**	**447.8**	**436.8**	**474.1**	**506.8**	**516.5**	**549.0**	**595.9**	**658.8**	**720.4**	**751.3**	**791.3**
China	36.2	32.5	23.1	22.5	25.4	29.8	29.9	35.0	39.2	57.7	59.0	64.5	68.7
India	33.2	34.7	26.7	26.2	29.7	31.5	33.5	35.5	40.9	45.4	50.7	58.3	67.3
Indonesia	23.8	22.7	14.2	13.2	14.4	15.3	16.2	16.5	19.2	20.4	19.6	18.4	19.6
Malaysia	14.3	15.5	9.7	8.8	10.6	12.4	12.1	11.4	14.4	14.3	13.3	14.7	17.7
Philippines	12.8	11.1	8.7	8.7	9.2	8.6	7.9	8.1	8.8	8.8	7.6	8.2	8.7
South Korea	43.3	45.7	37.1	36.3	41.7	56.0	60.3	61.4	74.7	78.8	85.9	94.1	109.3
Taiwan China	23.7	21.8	17.1	17.5	18.7	18.7	18.0	18.5	17.6	20.2	21.8	23.8	29.6
Thailand	9.3	9.5	6.0	5.8	7.1	7.3	8.3	8.0	9.6	8.7	9.0	9.3	10.3
Total Asia and Pacific EMEs	**228.3**	**225.7**	**168.3**	**165.3**	**184.2**	**211.1**	**220.1**	**233.2**	**268.4**	**306.9**	**323.3**	**365.6**	**404.6**
Cyprus	43.0	45.8	41.6	42.1	44.7	50.1	53.2	53.3	58.9	65.5	73.7	76.9	82.4
Czech Republic	52.6	69.5	65.8	56.7	59.4	65.0	69.6	78.2	91.8	94.2	106.3	113.2	136.7
Hungary	71.3	81.3	63.0	58.0	60.1	63.0	66.2	73.6	88.4	92.4	100.1	112.1	123.4
Poland	107.7	112.5	97.7	83.1	88.0	92.9	96.2	107.7	141.0	151.7	166.6	186.1	215.9
Russia	63.2	77.0	53.4	57.6	62.2	63.0	63.6	72.3	90.5	109.3	129.1	142.2	154.6
Turkey	40.9	42.1	29.5	30.3	35.2	34.5	40.2	59.0	63.2	63.7	73.7	90.2	90.0
Total European EMEs and new EU Member States	**548.0**	**634.6**	**543.2**	**519.4**	**557.9**	**604.6**	**638.7**	**754.1**	**881.4**	**948.2**	**1,060.1**	**1,209.5**	**1,319.4**
Argentina	21.1	20.5	17.1	16.4	16.0	16.7	17.6	19.2	19.2	20.9	21.0	20.7	21.7
Brazil	81.4	90.0	91.7	89.6	100.9	101.6	99.5	119.2	125.6	142.5	149.0	167.1	176.1
Chile	38.9	39.7	38.5	40.2	41.5	43.2	42.9	44.4	45.7	49.8	54.2	59.7	71.3
Colombia	8.5	9.2	8.1	9.8	10.2	10.0	10.4	11.5	13.4	15.3	14.7	15.8	15.6
Ecuador	1.2	1.1	0.9	0.9	0.7	0.6	0.7	0.6	0.7	0.6	1.1	0.8	0.7
Mexico	128.5	134.0	130.5	135.8	133.3	136.6	143.3	151.2	146.1	162.8	168.0	181.0	177.6
Peru	10.7	11.1	10.4	11.1	7.0	6.9	6.6	7.2	7.8	8.2	9.3	10.8	12.9
Uruguay	2.6	2.4	2.2	2.4	2.5	2.5	2.6	2.6	2.9	3.1	2.9	3.3	4.0
Venezuela	15.9	17.5	16.6	18.7	18.6	19.3	19.2	22.8	22.8	23.2	24.1	25.9	25.1
Total Latin America	**322.2**	**338.4**	**326.4**	**335.8**	**341.2**	**350.1**	**354.8**	**390.9**	**396.2**	**440.1**	**458.6**	**502.6**	**523.7**
Iran	16.1	16.8	12.8	11.8	11.9	12.0	11.8	11.7	11.9	11.8	11.8	11.8	11.8
Morocco	13.5	11.9	12.7	12.5	13.1	13.7	13.8	14.8	15.3	16.2	18.2	16.5	23.2
South Africa	18.0	17.0	12.2	11.4	14.9	12.8	15.4	14.5	15.6	18.5	18.5	17.7	18.1
Total Middle East and Africa	**150.8**	**144.6**	**114.2**	**117.3**	**130.6**	**131.5**	**140.4**	**146.0**	**159.4**	**178.1**	**191.6**	**219.3**	**240.9**

Source: BIS.

Chart S102 Euro area banks' credit standards for loans and credit lines to enterprises and contributing factors

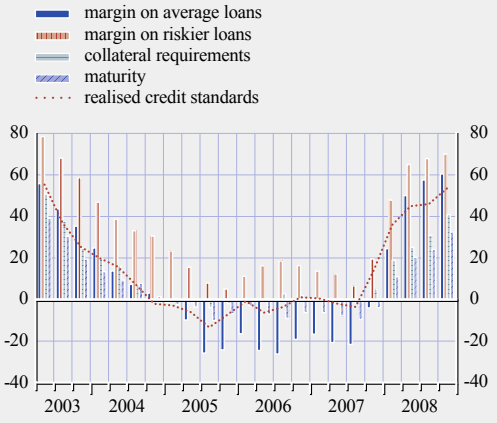
(Q2 2003 – Q4 2008; net percentage; two-quarter moving average)



Source: ECB.
Note: The net percentages refer to the difference between those banks reporting that credit standards had been tightened and that the given factors had contributed to a tightening of credit standards compared to the previous quarter and those banks reporting that they had been eased.

Chart S103 Euro area banks' credit standards for loans and credit lines to enterprises and terms and conditions

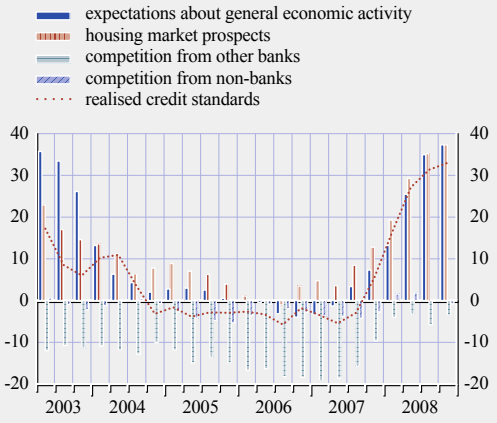
(Q2 2003 – Q4 2008; net percentage; two-quarter moving average)



Source: ECB.
Note: The net percentages refer to the difference between those banks reporting that credit standards, terms and conditions had been tightened compared to the previous quarter and those banks reporting that they had been eased.

Chart S104 Euro area banks' credit standards for loans to households for house purchase and contributing factors

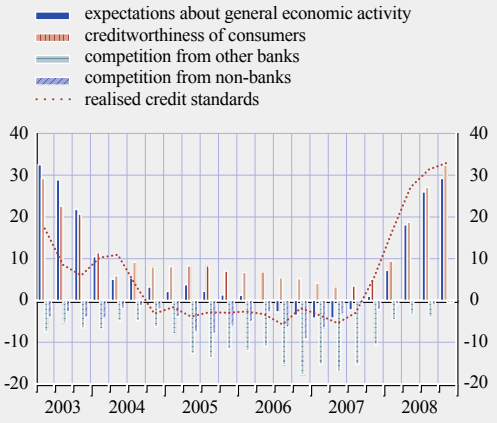
(Q2 2003 – Q4 2008; net percentage; two-quarter moving average)



Source: ECB.
Note: The net percentages refer to the difference between those banks reporting that credit standards had been tightened and that the given factors had contributed to a tightening of credit standards compared to the previous quarter and those banks reporting that they had been eased.

Chart S105 Euro area banks' credit standards for consumer credit loans to households and contributing factors

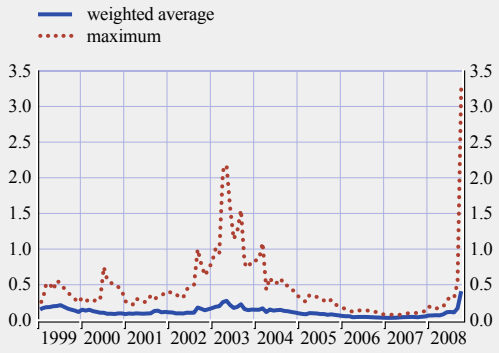
(Q2 2003 – Q4 2008; net percentage; two-quarter moving average)



Source: ECB.
Note: The net percentages refer to the difference between those banks reporting that credit standards had been tightened and that the given factors had contributed to a tightening of credit standards compared to the previous quarter and those banks reporting that they had been eased.

Chart S106 Expected default frequencies (EDFs) for large and complex banking groups in the euro area

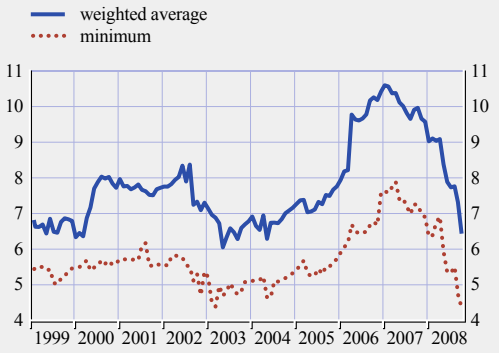
(Jan. 1999 – Oct. 2008; percentage probability)



Sources: Moody's KMV and ECB calculations.
Note: The EDF provides an estimate of the probability of default over the following year. Due to measurement considerations, the EDF values are restricted by Moody's KMV to the interval between 0.01% and 35%.

Chart S107 Distance-to-default for large and complex banking groups in the euro area

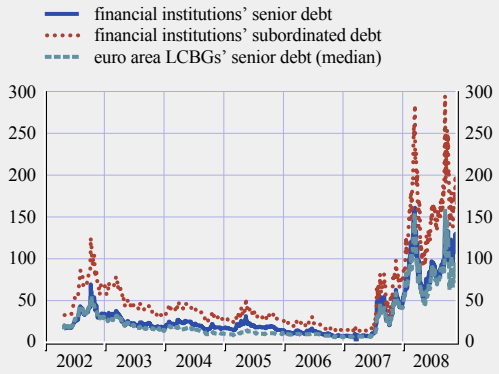
(Jan. 1999 – Oct. 2008)



Sources: Moody's KMV and ECB calculations.
Note: An increase in the distance-to-default reflects an improving assessment.

Chart S108 European financial institutions' and euro area large and complex banking groups' credit default swap spreads

(May 2002 – Nov. 2008; basis points; five-year maturity)



Sources: JPMorgan Chase & Co. and Bloomberg.
Note: European financial institutions and non-financial institutions correspond to the definitions of JPMorgan Chase & Co.

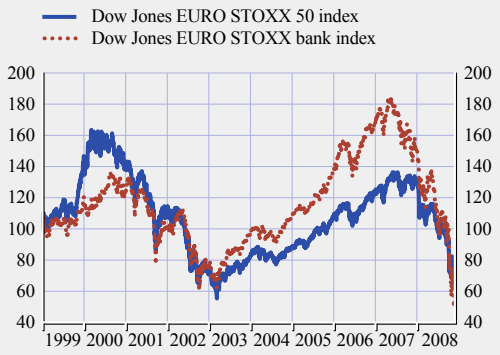
Chart S109 Earnings and earnings forecasts for large and complex banking groups in the euro area

(Q1 1999 – Q4 2009; percentage change per annum; weighted average)

Sources: Thomson Financial Datastream, I/B/E/S and ECB calculations.
Note: Derived from earnings per share (EPS) adjusted for the number of shares outstanding.

Chart S110 Dow Jones EURO STOXX total market and bank indices

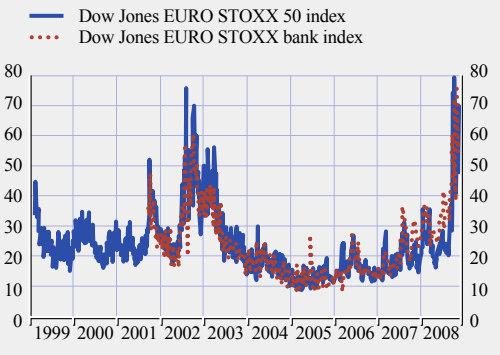
(Jan. 1999 – Nov. 2008; index: Jan. 1999 = 100)



Source: Bloomberg.

Chart S111 Implied volatility for Dow Jones EURO STOXX total market and bank indices

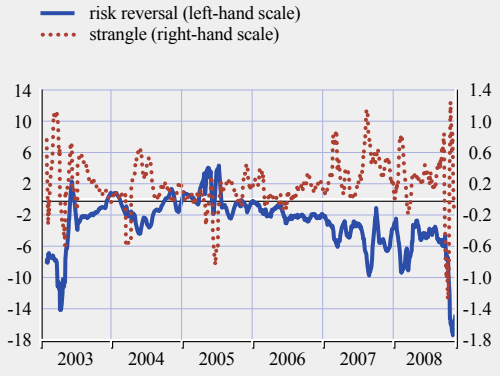
(Jan. 1999 – Nov. 2008; percentage)



Source: Bloomberg.

Chart S112 Risk reversal and strangle of the Dow Jones EURO STOXX bank index

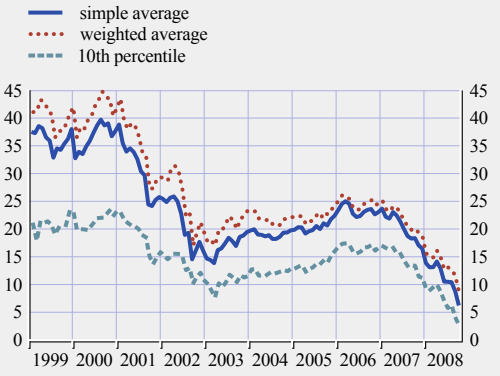
(Feb. 2003 – Nov. 2008; percentage; implied volatility; 20-day moving average)



Sources: Bloomberg and ECB calculations.
Note: The risk-reversal indicator is calculated as the difference between the implied volatility of an out-of-the-money (OTM) call with 25 delta and the implied volatility of an OTM put with 25 delta. The "strangle" is calculated as the difference between the average implied volatility of OTM calls and puts, both with 25 delta, and the average at-the-money volatility of calls and puts with 50 delta.

Chart S113 Price/earnings (P/E) ratios for large and complex banking groups in the euro area

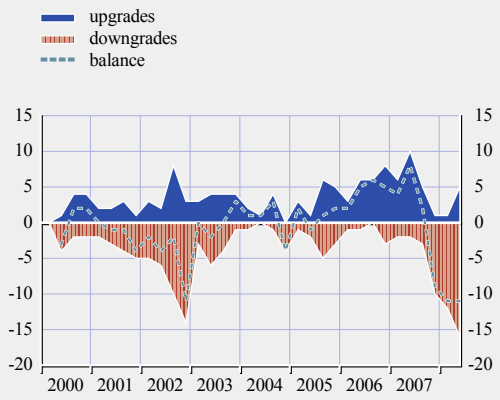
(Jan. 1999 – Oct. 2008; percentage; ten-year trailing earnings)



Sources: Thomson Financial Datastream and ECB calculations.
Note: The P/E ratio is based on prevailing stock prices relative to an average of the previous ten years of earnings.

Chart S114 Rating actions for large and complex banking groups in the euro area

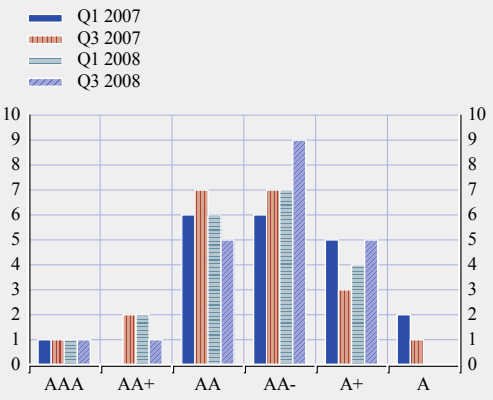
(Q1 2000 – Q3 2008; number)



Sources: Moody's, Fitch Ratings and Standard and Poor's.
Note: This includes both the outlook and actual rating changes.

Chart S115 Distribution of ratings for large and complex banking groups in the euro area

(number of banks)



Sources: Moody's, Fitch Ratings and Standard and Poor's.

Table S7 Rating averages and outlook for large and complex banking groups in the euro area

(September 2008)

	Moody's	S&P	Fitch	Total
Ratings available out of sample	22	22	22	66
Outlook available	22	22	22	66
Rating average	Aa2	AA-	AA-	3.95
Outlook average	-0.3	-0.40	0.00	-0.23
Number of negative outlooks	6	9	2	17
Number of positive outlooks	0	0	2	2

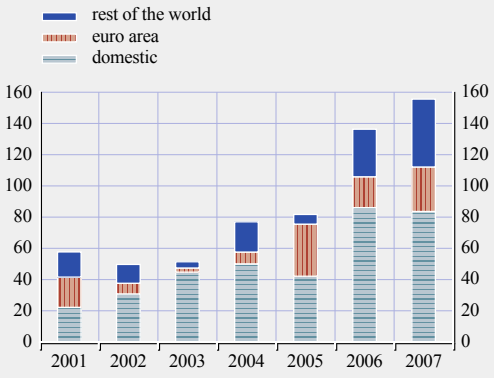
Rating codes	Moody's	S&P	Fitch	Numerical equivalent
	Aaa	AAA	AAA	1
	Aa1	AA+	AA+	2
	Aa2	AA	AA	3
	Aa3	AA-	AA-	4
	A1	A+	A+	5
	A2	A	A	6
	A3	A-	A-	7

Outlook	Stable	Positive	Negative
Numerical equivalent	0	1	-1

Sources: Moody's, Fitch Ratings, Standard and Poor's and ECB calculations.

Chart S116 Value of mergers and acquisitions by euro area banks

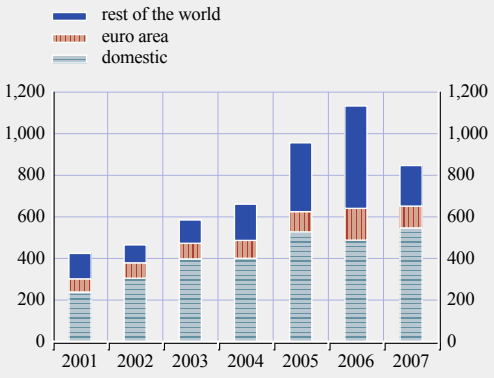
(2001 – 2007; EUR billions)



Sources: Bureau van Dijk (ZEPHYR database) and ECB calculations.
Note: All completed mergers and acquisitions (including also institutional buyouts, joint ventures, management buyouts/ins, demergers, minority stakes and share buybacks) where a bank is the acquirer.

Chart S117 Number of mergers and acquisitions by euro area banks

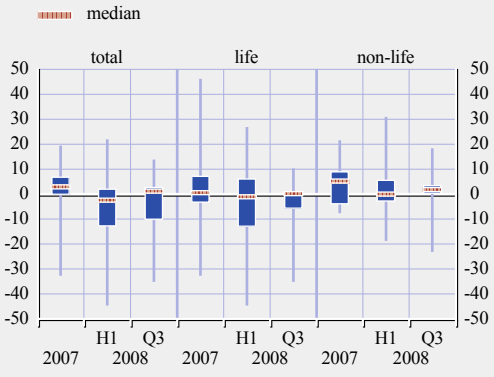
(2001 – 2007; total number of transactions)



Sources: Bureau van Dijk (ZEPHYR database) and ECB calculations.
Note: All completed mergers and acquisitions (including also institutional buyouts, joint ventures, management buyouts/ins, demergers, minority stakes and share buybacks) where a bank is the acquirer.

Chart S118 Distribution of gross-premium-written growth for a sample of large euro area primary insurers

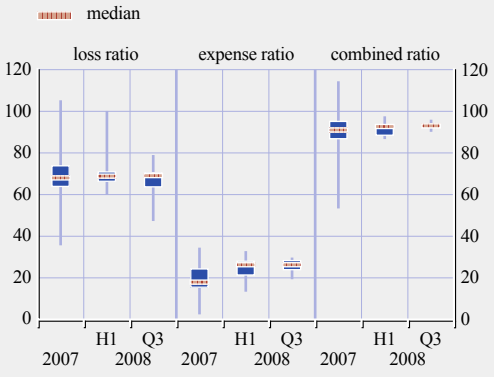
(2007 – Q3 2008; percentage change per annum; nominal values; maximum, minimum, interquartile distribution)



Sources: Bloomberg and ECB calculations.
Note: Based on figures for 19 large euro area insurers.

Chart S119 Distribution of loss, expense and combined ratios in non-life business for a sample of large euro area primary insurers

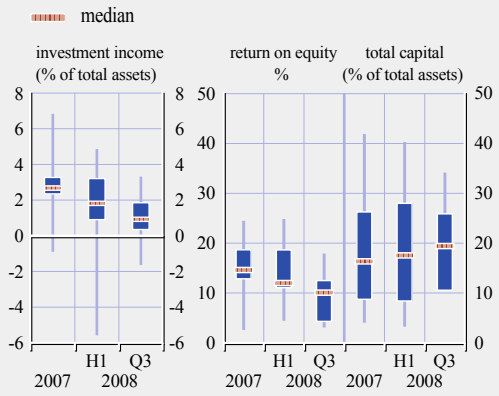
(2007 – Q3 2008; percentage of premiums earned; maximum, minimum, interquartile distribution)



Sources: Bloomberg and ECB calculations.
Note: Based on figures for 19 large euro area insurers.

Chart S120 Distribution of investment income, return on equity and solvency for a sample of large euro area primary insurers

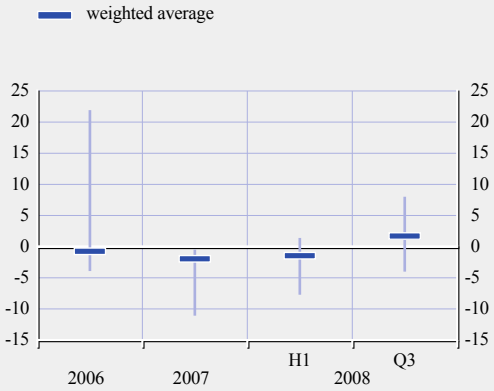
(2007 – Q3 2008; maximum, minimum, interquartile distribution)



Sources: Bloomberg and ECB calculations.
Note: Based on figures for 19 large euro area insurers.

Chart S121 Distribution of gross-premium-written growth for a sample of large euro area reinsurers

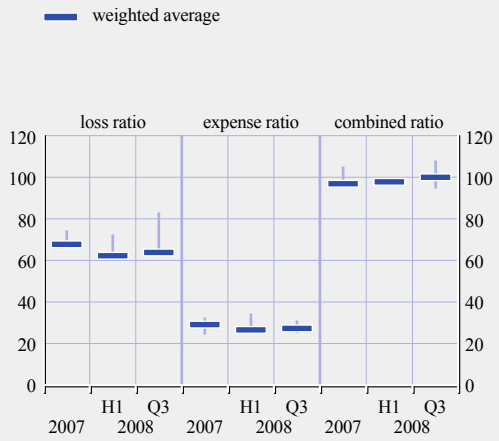
(2006 – Q3 2008; percentage change per annum; maximum-minimum distribution)



Sources: Bloomberg and ECB calculations.
Note: Based on figures for four large euro area reinsurers.

Chart S122 Distribution of loss, expense and combined ratios for a sample of large euro area reinsurers

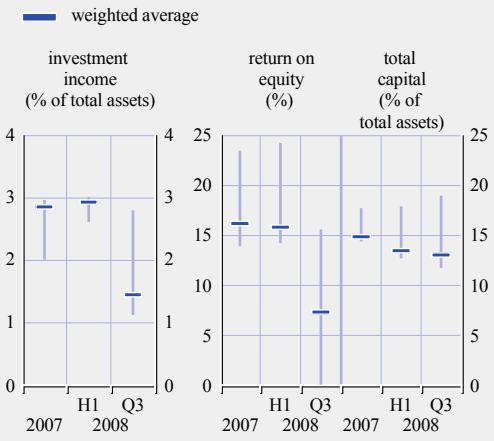
(2007 – Q3 2008; percentage of premiums earned; maximum-minimum distribution)



Sources: Bloomberg and ECB calculations.
Note: Based on figures for four large euro area reinsurers.

Chart S123 Distribution of investment income, return on equity and solvency for a sample of large euro area reinsurers

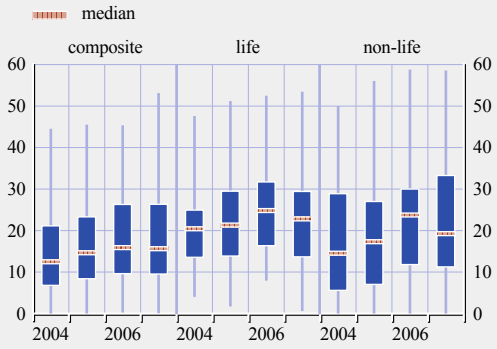
(2007 – Q3 2008; maximum-minimum distribution)



Sources: Bloomberg and ECB calculations.
Note: Based on figures for four large euro area reinsurers.

Chart S124 Distribution of equity asset shares of euro area insurers

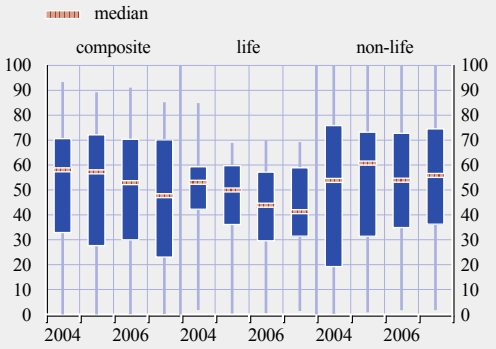
(2004 – 2007; percentage of total investments; maximum, minimum, interquartile distribution)



Source: Standard and Poor's (Eurothesys database).

Chart S125 Distribution of bond asset shares of euro area insurers

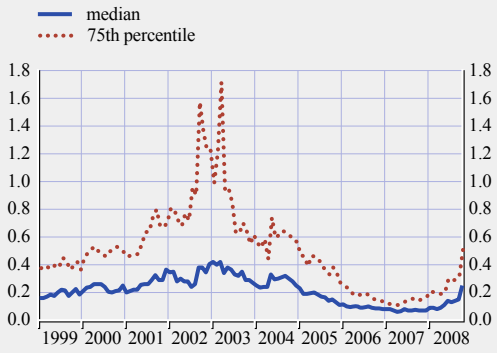
(2004 – 2007; percentage of total investments; maximum, minimum, interquartile distribution)



Source: Standard and Poor's (Eurothesys database).

Chart S126 Expected default frequencies (EDFs) for the euro area insurance sector

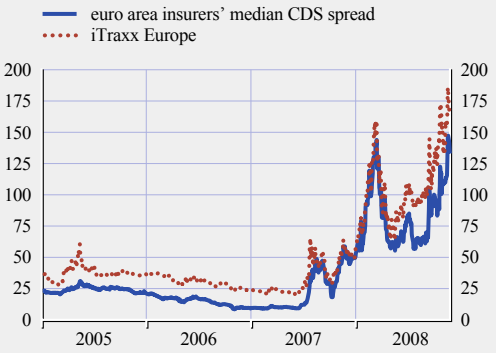
(Jan. 1999 – Oct. 2008; percentage probability)



Source: Moody's KMV.
Note: The EDF provides an estimate of the probability of default over the following year. Due to measurement considerations, the EDF values are restricted by Moody's KMV to the interval between 0.01% and 35%.

Chart S127 Credit default swap spreads for a sample of large euro area insurers and the iTraxx Europe main index

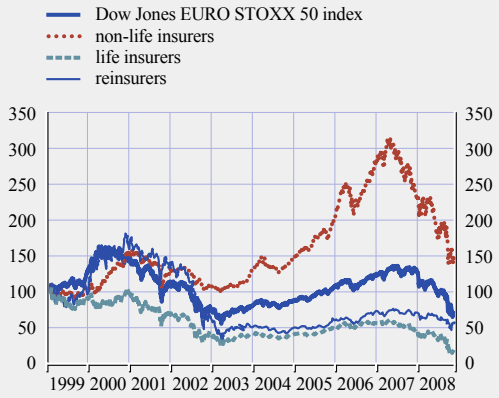
(Jan. 2005 – Nov. 2008; basis points; five-year maturity)



Sources: Bloomberg and JPMorgan Chase & Co.

Chart S128 Dow Jones EURO STOXX total market and insurance indices

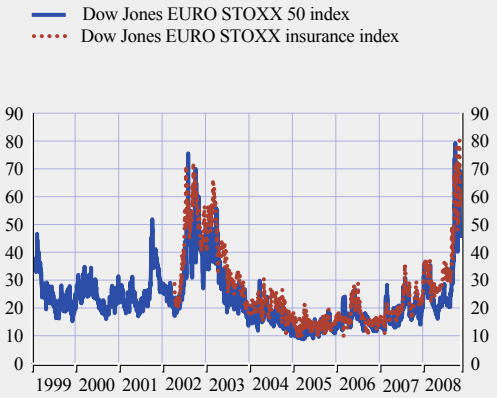
(Jan. 1999 – Nov. 2008; index: Jan. 1999 = 100)



Source: Thomson Financial Datastream.

Chart S129 Implied volatility for Dow Jones EURO STOXX total market and insurance indices

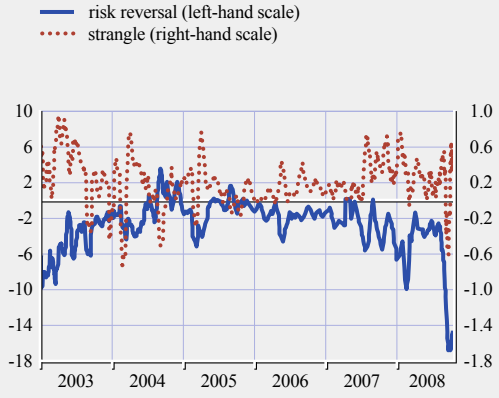
(Jan. 1999 – Nov. 2008; percentage)



Source: Bloomberg.

Chart S130 Risk reversal and strangle of the Dow Jones EURO STOXX insurance index

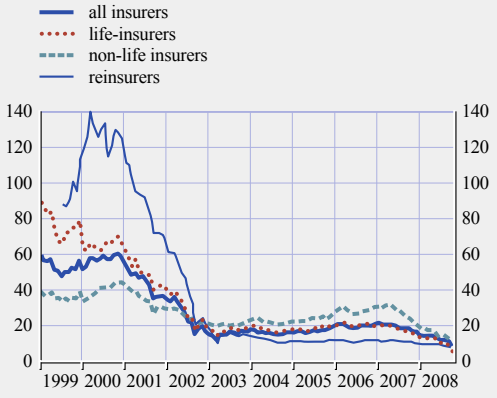
(Jan. 2003 – Nov. 2008; percentage; implied volatility; 20-day moving average)



Sources: Bloomberg and ECB calculations.
Note: The risk-reversal indicator is calculated as the difference between the implied volatility of an out-of-the-money (OTM) call with 25 delta and the implied volatility of an OTM put with 25 delta. The "strangle" is calculated as the difference between the average implied volatility of OTM calls and puts, both with 25 delta, and the average at-the-money volatility of calls and puts with 50 delta.

Chart S131 Price/earnings (P/E) ratios for euro area insurers

(Jan. 1999 – Oct. 2008; percentage; ten-year trailing earnings)

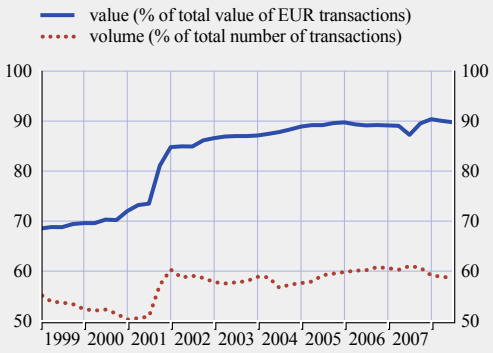


Sources: Thomson Financial Datastream and ECB calculations.
Note: The P/E ratio is based on prevailing stock prices relative to an average of the previous ten years of earnings.

6 EURO AREA FINANCIAL SYSTEM INFRASTRUCTURES

Chart S132 Large-value payments processed via TARGET

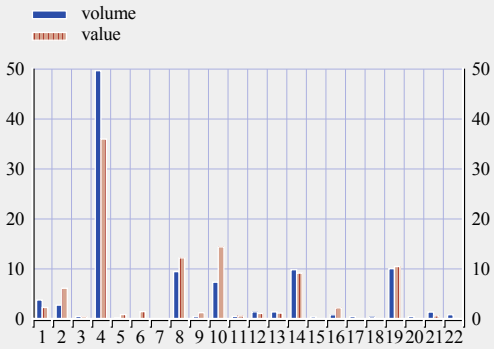
(Q1 1999 – Q3 2008)



Source: ECB.

Chart S133 Large-value payments processed via TARGET, by country

(Q2 2008 – Q3 2008; percentage of the NCB/ECB shares in terms of value and volume)



1 AT	5 DK	9 FI	13 IE	17 LV	21 PT
2 BE	6 ECB	10 FR	14 IT	18 MT	22 SI
3 CY	7 EE	11 GB	15 LT	19 NL	
4 DE	8 ES	12 GR	16 LU	20 PL	

Source: ECB.
Note: The figures of B1-REL (IT) include the figures of SORBNET EURO (PL) and EP RTGS (EE). The figures of RTGS plus include the figures of Slovenia (SI). Eesti Pank joint TARGET on 20 November 2006 and connected its RTGS system via B1-REL (IT) Banka Slovenije has used RTGS plus (DE) to connect to TARGET since the commencement of its operations as member of the Eurosystem on 2 January 2007. As of 1 January 2007 Sveriges Riksbank no longer participates in TARGET.

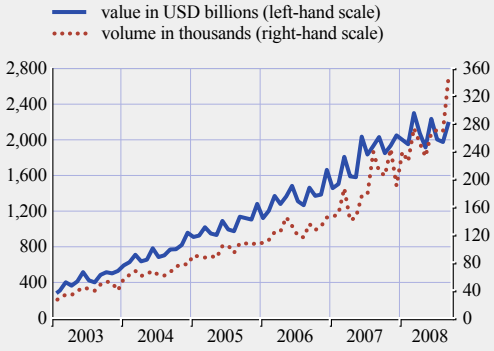
Chart S134 TARGET availability

(Jan. 1999 – Sep. 2008; percentage; three-month moving average)

Source: ECB.

Chart S135 Volumes and values of foreign exchange trades settled via Continuous Linked Settlement (CLS)

(Jan. 2003 – Sep. 2008)



Source: ECB.

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