EUROPEAN CENTRAL BANK

FINANCIAL STABILITY REVIEW

DECEMBER 2004

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In 2004 all ECB publications will feature a motif taken from the €100 banknote.

FINANCIAL STABILITY REVIEW
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Unless otherwise stated, this document uses data available as at 12 November 2004.

ISSN 1830-2017 (print)
ISSN 1830-2025 (online)

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FOREWORD

Central banks have a strong and natural interest in the safeguarding of financial stability. This is in particular because financial institutions, notably banks, are issuers of by far the largest component of the money stock. It is equally because a stable financial system is needed for an effective transmission of monetary policy and for the smooth operation of payment systems. A robust financial system is therefore needed to ensure that the single moneary policy can deliver on the primary objective of maintaining price stability in the euro area. Finally, but not least, the health of the financial system is inextricably intertwined with the performance of the economy and its resilience to shocks. These are the reasons why the European Central Bank (ECB) and the Eurosystem have an important stake in financial stability in the euro area.

Complex to define, financial stability should not be seen only from the perspective of avoiding financial crises. Financial stability also has a positive dimension. It is a condition where the financial system is capable of performing well at all of its normal tasks and where it is expected to do so for the foreseeable future. From this viewpoint, financial system stability requires that the principal components of the system – i.e. financial institutions, markets and infrastructures – are jointly capable of absorbing adverse disturbances. It requires that the financial system is facilitating a smooth and efficient reallocation of financial resources from savers to investors, that financial risk is being assessed and priced accurately and that risks are being efficiently managed. Financial stability also has an important forward-looking dimension: inefficiencies in the allocation of capital or shortcomings in the pricing of risk can, by laying the foundations for vulnerabilities, compromise future financial system stability and therefore economic stability.

Three steps are needed to produce a comprehensive picture of the stability of the financial system. The first entails forming an assessment of the individual and collective robustness of the institutions, markets and infrastructures that make up the financial system. The second involves an identification of the main sources of risk and vulnerability that could pose challenges for financial system stability in the future. The third and final step is an appraisal of the ability of the financial system to cope with crisis, should these risks materialise. The overall assessment will determine whether remedial action is needed. It is important to bear in mind that calling attention to the main sources of risk and vulnerability to financial stability does not aim at identifying the range of most probable outcomes such as that which underlies the monetary policy process. Rather it entails the highlighting of potential and plausible sources of negative events, even if these are remote and very unlikely.

In publishing this *Financial Stability Review*, the ECB is joining a growing number of central banks around the world that are addressing their financial stability mandates in part through the periodic issuing of a public report. 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 to financial stability, the review also seeks to help preventing financial tensions.

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 co-operation among the national central banks and supervisory authorities of the EU and the ECB.

This review has two main parts. The first part, from Chapters I through III, describes the main endogenous and exogenous trends and events that characterised the operating environment of the euro area financial system over the past year. The main sources of risk and vulnerability to future euro area financial system stability are also discussed in these chapters. The second part, Chapter IV, contains five special feature articles that explore selected financial stability issues in some depth.

Jean-Claude Trichet

President of the European Central Bank

I OVERVIEW OF RISKS TO FINANCIAL STABILITY

The capacity of the euro area financial system to absorb adverse disturbances appears to have improved since late 2003. Financial institutions and markets benefited from a stronger than expected strengthening in the pace of global economic activity, an easing of the credit risks of large firms and signs of improved risk appetites especially in fixed income markets. The profitability of banks improved as a result and insurance companies also enjoyed better profitability. Stresses in the life insurance industry were further eased by efforts made by firms in curtailing balance sheet mismatches. At the same time, earlier signs of fragility in global financial markets waned. Leveraged "carry-trades" – positions involving the borrowing of short-term funds to finance longer-term investments, which had been built up in 2003 – were temporarily unwound as market yield curves became steeper after March 2004. The rebalancing of portfolios occurred without abnormally high volatility in either foreign exchange or fixed income markets and widespread fears of a possible repeat of the 1994 global bond market turbulence proved so far to be unfounded. Moreover, asset price volatility subsequently receded across a wide range of markets and some issuers of securities began to find investor appetites more receptive. In addition, key financial infrastructures – including payments systems, such as TARGET, and securities settlement systems – have remained robust, continuing to facilitate a smooth reallocation of financial resources.

Although the outlook for euro area financial system stability has improved since late 2003, some potential sources of risk and vulnerability remain. Within the financial system, pockets of fragility may still exist. In the banking sectors of some euro area countries, although solvency has remained comfortable, profitability has remained frail. In the insurance sector – especially the life insurance industry – solvency pressures, albeit improving, have not fully eased. This is not least because of persistently low long-term interest rates. The low returns available in high quality fixed income markets also seemed to encourage greater risk-taking. A search for yield cascaded down the credit quality spectrum and the positions were apparently often underpinned by leverage and frequently undertaken by hedge funds. To the extent that this search for yield took asset prices above intrinsic values in some corporate, emerging-economy debt and other securities markets, vulnerabilities to a reappraisal and repricing of risk may be present.

Outside the euro area financial system, persistently wide global financial imbalances continue to pose medium-term risks to the stability of foreign exchange and other financial markets. The surge in oil prices throughout 2004, should it prove to be as lasting as futures prices suggest, could test the robustness of smaller firms' finances, where the process of balance sheet repair has lagged behind that of larger firms. Questions also remain about the balance sheet vulnerabilities to interest rates of smaller firms and households – especially where house price increases have outstripped disposable income growth, where leverage has become significant and where variable rate contracts represent a large share of outstanding mortgage.

Calling attention to sources of risk and vulnerability to financial stability such as these does not aim at identifying the most probable outcome. It rather entails the highlighting of potential and plausible sources of downside risk, even if these are relatively remote. The remainder of this chapter examines the main sources of risk and vulnerability to financial system stability in the euro area and it concludes with an overall assessment of the outlook.

RISKS FROM GLOBAL FINANCIAL IMBALANCES

Large and growing US current account deficits have generally been perceived as posing a significant risk for global financial stability, at least since 2000. This is partly because of the demands they place on international capital markets. It is also because their accumulation has implied a sizeable increase in US external

indebtedness, thereby raising questions about medium-term sustainability. Concerns about sustainability can raise the likelihood of disorderly rebalancing – involving capital account adjustment and/or the possibility of severe downward pressure on the US dollar. Pressures surfaced in foreign exchange markets after late 2003 but they had lessened by the spring of 2004, in line with a widely shared change in view that the stance of US monetary policy would be tightened. However, pressures resurfaced in foreign exchange markets in late 2004.

The principal source of the ballooning of the US current account deficit to record levels in 2004, both in absolute and relative terms, was the progressive easing of US fiscal policy after 2000. Indications are that the fiscal deficit is unlikely to contract significantly in the period ahead. Heavy household sector borrowing – to a larger extent than in the past – has also been an important source of growing current account deficits. The corporate sector, by contrast, has been a net lender of funds. Looking ahead, as the process of corporate sector balance sheet strengthening begins to show signs of maturing and with the US short-term macroeconomic outlook remaining favourable, firms may begin to tap external sources for funds. Hence, unless households take steps to rein in their debts, current account imbalances could yet expand further.

Ultimately, the sustainability of the US current account deficit rests upon the ability and willingness of external investors to finance it. The counterpart of the US external imbalance has been surpluses in other regions of the world, including the euro area and Asia. Current account surpluses in Japan have been rising and they have remained large in emerging Asia. The exchange rate policies of several Asian economies have been aimed at fostering export-oriented growth strategies by stabilising exchange rates. This has led to both foreign exchange market interventions – although Japanese intervention in the foreign exchange markets ceased in March – and the accumulation of substantial foreign exchange reserves by Asian central banks. It has also led to a recycling of foreign exchange reserves into the US Treasury and agency bond markets. This has served to compensate for the decline in net direct investment into the US and the drop in external private investment in the US equity markets in the wake of the bursting of the equity market bubble. As a result, net capital flows to the US have been reasonably well sustained. However, ongoing recycling of Asian central bank reserves into US fixed income markets, has underpinned the further widening of US imbalances, thereby delaying adjustment.

If the recent widening of global imbalances is not corrected over the medium term, important risks would remain. Their significance will depend inter alia on the ability of the Chinese authorities to steer a course for growth that avoids either a sharp slowdown or the emergence of significant over-heating pressures, as well as the speed and scale of US balance sheet adjustment, both private and public. If US savings-investment imbalances narrow, then the likelihood of a disorderly US current account adjustment would fall commensurately.

RISKS IN CAPITAL MARKETS

Long-term nominal interest rates should generally reflect expectations for long-term inflation and economic growth, abstracting from risk premia. US long-term government bond yields dropped below consensus expectations for long-term nominal GDP growth in the course of 2002 and the gap between the two endured throughout 2004. This was despite an improved short-term economic outlook, renewed risk-taking in financial markets, growing twin – fiscal and current account – deficits and surveys of institutional investors that persistently revealed concerns about the possibility of an abrupt upturn in bond yields. Moreover, even though yields climbed in anticipation of a widely expected upturn in US official interest rates, they subsequently fell back, contrasting with market yield curve patterns seen on earlier occasions of monetary policy tightening.

One factor holding long-term interest rates down more recently may have been the strength of oil prices, by weighing on expectations for global growth. However, the large and growing official inflows into US bond markets, a by-product of global financial imbalances, also appears to have been an important factor in bearing down on yields. Compounding this, "carry trades" along the US yield curve – possibly predicated on the view that upside risks for bond yields were mitigated by the weight of Asian inflows – also weighed on long-term yields. This was indicated by yardsticks of speculative activity in US bond markets and by the strength of flows into hedge funds in 2003 and 2004. Also in the euro area, greater risk-taking in fixed income markets was indicated by a rise in the Value at Risk (VaR) readings for interest rates of some major European banks.[1] Notably, there were some indications that US yield curve carry-trades began to unwind before June, in anticipation of the tightening of US monetary policy, so that portfolio rebalancing in the bond market was orderly. However, indications are that leverage began to rise again after July, potentially leaving the bond market vulnerable to shocks.

In the event of an unexpected disruption in the US Treasury market, it is unlikely that the euro area financial system would be left unperturbed. Global over-the-counter (OTC) interest-rate derivative markets – markets that are known to be highly concentrated – would face strains from dynamic hedging activity. The concentration in these markets, where several large euro area financial institutions have counterparty exposures, can raise the vulnerability of the global financial system to financial disruption. Moreover, risks could spill over through other channels of contagion to the euro area financial system. They could arise through correlation between US and euro area long-term bond yields, which tends to be high at times of market stress, through unhedged interest rate exposures of some euro area financial institutions or through exposures to hedge funds.

There are also risks in private fixed income securities markets and emerging markets that could have financial stability implications. Notwithstanding the increases in US official interest rates from June 2004, low official interest rates in the major economies, together with a recovery of risk appetites, encouraged a search for yield by investors across a range of markets in 2003 that continued into 2004. It also favoured substantial growth in the global hedge fund industry. Faced with long-term government bond yields at historical lows and relatively cheap and abundant sources of liquidity, investors sought alternative instruments with higher yields but, concomitantly, greater risk. Beginning with higher quality corporate debt securities, the quest for yield occurred in the euro area as well, cascading down the credit quality spectrum and compressing spreads in distressed debt markets and those on complex fixed income securities such as collateralised debt obligations (CDOs). It also affected commodity markets – including financial derivatives on oil – and financial options markets. The volatility implied in options prices reached very low levels across several asset classes. In equity options markets this was possibly induced, in part, through an arbitrage process with credit spreads via CDO markets. This interplay may have served to underpin a trend of rising leveraged credit investment – where CDOs of CDOs gained in popularity – that may have left credit derivative markets vulnerable to adverse disturbances.

While the fundamentals have often underpinned a favourable repricing of risk, it has not always been clear that sufficient risk discrimination has taken place. Euro area issuers of corporate bonds have enjoyed equally generous corporate bond spread compression as their US counterparts since early 2003. This is despite the fact that US corporate sector debt ratios have dropped by a larger margin. The pricing of credit risk might

1 Value at risk (VaR) measures market risk in terms of potential financial losses on the current portfolio. It is usually based on the historic pattern of movements in financial markets and it can be interpreted as the worst-case scenario for losses that could be incurred on an investment portfolio within a given timeframe and confidence interval.

reflect expectations that further balance sheet strengthening by euro area corporations lies ahead – particularly by those issuers that faced market discipline through rating downgrades. However, possibly inordinate investor demand for fixed income securities may also explain the general compression of spreads. To the extent that the pricing of credit risk by banks is market sensitive, it cannot be ruled out that the hunt for yield in capital markets has also impacted on loan pricing, particularly for lending to those large enterprises that are able to tap the capital markets for funds.

Looking ahead, those financial institutions, including euro area banks, which hold emerging market and corporate debt securities, may yet face greater-than-normal interest rate risks. This is because it cannot be excluded that a pick-up in corporate bond issuance activity together with an unexpected upturn in longer-term rates and/or a reappraisal of credit risks could press spreads wider in corporate bond markets. Moreover, in an environment where market volatility has been relatively low, it cannot be excluded that those institutions that manage their financial risks based on VaR approaches – including some euro area banks – may find that they have set aside insufficient risk capital for seemingly low risk and uncorrelated positions. This is because these positions could quickly become highly volatile and correlated in the event of an unexpected market disturbance.

The increasing proliferation of hedge funds as an alternative investment for both institutional and retail investors raises questions about the trade-offs between financial efficiency and financial system stability. From an efficiency perspective, hedge funds can have a positive effect on the financial system: they contribute to market liquidity, play an important role in the price discovery process, contribute to the elimination of market inefficiencies, and they offer diversification benefits to investors. From a financial stability perspective, compared to the past, when hedge funds were associated with adverse market disturbances, the growth in the number of funds that have entered the market has meant that particular investment positions may have become less concentrated within individual institutions. Also, available evidence suggests that the leverage levels taken on by funds are lower than was the case in the past. Nevertheless, there is a risk that as more financial resources flow into hedge funds and as profit opportunities diminish commensurately, some funds might be encouraged to take on more risk or leverage to achieve targeted returns. In addition, there is the possibility that the positioning of individual hedge funds may become increasingly similar. This can lead to "crowded trades" – where many funds have the identical investment positions – which poses risks of market disturbances in case of attempts to exit positions simultaneously.

EXPOSURES TO EURO AREA NON-FINANCIAL SECTORS

By supporting profit and household income growth, the ongoing recovery in economic activity together with relatively low interest rates is enhancing the ability of households and firms to respectively service debts and strengthen balance sheets. While risks remain in both sectors, corporations have generally made more headway in repairing their balance sheets than households since late 2003. This means that corporate sector credit risks faced by banks, investors in corporate bonds and participants in credit risk transfer (CRT) markets have continued to ease. It also means that the balance of sectoral downside risks may be tilting in the direction of households in some countries.

An ongoing strengthening of balance sheets after 2002 left large euro area firms well positioned to profit from the strengthening of global demand. A reduction in the operating leverage of large firms, thanks to cost-cutting, underpinned significant profit growth. This boosted cash-flows and the ability to service debts. Credit ratings have acknowledged the turnaround that has taken place in the financial conditions of the euro area corporate sector and downgrade-upgrade ratios improved continuously after late 2002. Other market-based indicators of credit

risk, such as expectations of the frequency of default over the coming 12 months, show a positive reassessment for larger firms.

This notwithstanding, some vulnerabilities remain within corporate sub-sectors. For enterprises whose revenues rely more heavily on the strength of domestic demand, pressure for cost-cutting may remain, particularly given rising energy costs. The estimated number of insolvencies in the euro area rose in the first half of 2004 and little improvement appears likely in 2005, primarily reflecting the outlook for smaller firms. Some empirical evidence suggests that a growth rate in the region of 2-3% may be required to stabilise the incidence of bankruptcies in the euro area. This means that it cannot be ruled out that banks may be faced with further corporate loan losses in the period ahead. This is especially so as aggregate non-financial corporations' debt-to-profit ratios have remained anchored at relatively high levels meaning that balance sheet vulnerabilities to interest rates may remain.

From a medium-term perspective, a further financial stability implication of the hunt for yield is the potential consequences for the efficient allocation of capital in the economy. While in some instances, relatively low spreads on corporate debt may have facilitated balance sheet repair, easy access to finance may equally have delayed the process of balance sheet strengthening in some euro area corporate sub-sectors. To the extent that this has raised the leverage of issuers that were already heavily indebted, it may have laid foundations for balance sheet vulnerabilities in the next cycle.

Households in the euro area appear to face risks on both sides of their balance sheets. Relatively high house prices in some countries together with relatively high indebtedness – debt-to-disposable income ratios of euro area households scaled new heights in the first half of 2004 – leave them vulnerable to the possibility of rising interest rates. This is because higher interest rates would raise debt servicing burdens in those countries where mortgages are contracted primarily at floating rates. It could also take the air out of property markets where there are signs that prices may have risen above intrinsic values.

At an aggregate level, it does not appear likely that reasonable interest rate changes would severely diminish the strength of household balance sheets across the euro area. This is partly because it is often banks or investors in mortgage bonds rather than households that bear the bulk of interest rate risks in mortgages, given the preponderance of fixed- or quasi-fixed-rate contracts in the euro area. Furthermore, the recovery of equity markets after March 2003 has meant that household financial assets have increased sufficiently to keep debt-to-financial asset ratios at comfortable levels. This notwithstanding, there are significant differences in household exposures to interest rates across the euro area. The balance sheets of households are likely to prove more vulnerable in those few countries where both the prevalence of floating rate mortgages is high and where there are indications that house prices appear to have risen above intrinsic values. Furthermore, it cannot be excluded that the robustness of the finances of some highly income-geared households could be tested both by unexpectedly higher interest rates and by the strength of oil prices.

Risks to households in some euro area countries, where there are indications that house prices may have risen above intrinsic values, are possibly greater on the asset side of balance sheets. Banks appear, by and large, to have carefully managed the risks to collateral behind mortgages – through the setting of loan-to-value ratios at conservative levels – and households would probably bear the brunt of any property market reversal. The implications for financial stability would ultimately depend upon the severity of any wealth effect on household consumption.

FINANCIAL CONDITIONS OF EURO AREA BANKS

Following two years of decline, there was a turnaround in euro area banking sector profitability in 2003. While a few large euro area banks endured some deterioration in profits in 2003, this mostly resulted from once-off restructuring charges and write-downs – arising from losses on equity investments. Based on disclosures of several large banks, indications are that profits strengthened further in the first half of 2004. Solvency levels rose in 2003 and indications are that they improved further in the first half of 2004.

Underlying the profit improvement of euro area banks in 2003 was continued cost cutting and lowered provisioning for non-performing and doubtful loans while non-interest income also contributed positively. Trading income, in particular, was strengthened by buoyant financial markets and increased turnover generated, in part, by the growth of the hedge fund industry. However, net interest income, the core component of banking sector profitability, remained subdued both in 2003 and the first half of 2004. This was despite the strength of demand for housing loans and it mainly owed to a squeezing of interest rate margins. Looking ahead, further cost-cutting is unlikely to prove a sustainable source of profit growth since, taken to its' limit, it ultimately runs the risk of undermining core business activities. Nevertheless, based on recent findings from the ECB Bank Lending Survey, which gauges credit standards, the prospects for a strengthening of bank income growth appear to be broadly positive.

Looking ahead, the credit risk outlook for banks is cautiously optimistic, resting primarily on the outlook for economic activity and interest rates. Banks may be faced with greater than normal market risks – including the possibility of capital losses on fixed income securities – stemming from the possibility of an abrupt upturn in long-term interest rates. While not priced into market yield curves, this risk is priced into options markets as a low probability event. Banks with links to hedge funds may also be indirectly exposed to market risks. Any upturn in long-term rates could also slow lending growth to households and corporations. It could also strain the balance sheets of some small and medium-sized enterprises, raising the possibility of an upturn in default rates and loan losses. The likelihood of banks suffering credit losses from strains on households' abilities to service their mortgage debts, while limited, cannot be ruled out. Moreover, should a rise in long-term interest rates spill over to house price dynamics in some countries, it cannot be fully excluded that asset quality problems could arise. However, the risks related to the sustainability of house price levels in some euro area countries are primarily seen to be a risk to banks' income.

Forward-looking indicators based on asset prices suggest that the outlook for the euro area banking sector has brightened, particularly when compared to early 2003. Moreover, the incidence of rating downgrades diminished after mid-2003, with upgrades outweighing downgrades in the four quarters to mid-2004. This suggests that either the likelihood of the crystallisation of the main risks and vulnerabilities identified in this *Review* is judged as being low or that banks are assessed as being better positioned to absorb adverse disturbances.

FINANCIAL CONDITIONS OF INSURANCE COMPANIES

Financial disclosures by major euro area insurance companies for 2003 show significant improvement of profitability in both the life and the non-life sectors. Strong net premium income drove these positive results – the recovery of stock markets increased demand for unit-linked products in the life industry. However, the reinsurance sector endured a set-back due to a decline in premium income, the net investment income being insufficient to sustain the previous level of profitability.

Solvency ratios in the non-life and reinsurance sectors of the industry, which were already

comfortable, improved in 2003. However, solvency pressures have remained in the life insurance sector. The main reason why it has proved more challenging for life insurers to improve their solvency positions has been related to their inability to raise net investment income significantly in an environment where interest rates have remained low. Weak investment performances forced insurance companies to reduce guaranteed returns on life products, making these products less attractive and, thereby, restricting the scope of growth in premium written. Some retrenchment from risk-taking, including from credit risk transfer markets, was evident towards the end of 2003 and life insurance companies became focused on the rebuilding of capital bases. However, the profitability of the life insurance sector may be insufficient to rebuild capital. Compounding this, a relatively unreceptive appetite of investors for fresh equity issuance by insurers has made it difficult for life insurance companies to improve solvency. This adds to the challenges confronting the sector. Against this background, since early 2004 several market-based indicators have suggested a perception by market participants that insurance companies will remain challenged by the risks that lie ahead.

OVERALL ASSESSMENT

The risks to euro area financial stability in the near future have become less pronounced since late 2003. The continuation of the rather robust pace of economic activity outside the euro area together with a strengthening of the balance sheets of large firms and financial institutions are the most important factors underpinning this assessment. However, some risks remain. The possibility exists for the crystallisation of far-reaching market risks that stem from an aggressive search for yield that characterised global financial markets in 2003 and much of 2004. If disorderly, any correction may have the potential to disrupt the intermediation of funds through capital markets. While some financial institutions, such as banks, would likely endure losses – at least in the short-term – any upturn in long-term interest rates should help in relieving remaining balance sheet vulnerabilities in the life insurance industry.

Further ahead, the risk of an unruly unwinding of global imbalances remains, especially because they may yet widen further. It also seems that anaemic domestic demand in the euro area has left the balance sheets of small and medium-sized enterprises vulnerable to adverse disturbances. Household balance sheets may also be vulnerable in those countries where house prices seem to have risen beyond intrinsic values.

II THE MACRO-FINANCIAL ENVIRONMENT

I THE EXTERNAL ENVIRONMENT

I.1 RISKS AND FINANCIAL IMBALANCES IN THE EXTERNAL ENVIRONMENT

The recovery of the world economy got underway in mid-2002 (see Chart 1.1). It proved to be stronger than initially expected, and began to broaden and deepen after late 2003. Corporate sector balance sheets in the US, which had been laden with debt at the start of the upturn, benefited from a notable strengthening of profits. This led to improvement in cash flows and in the capacity to repay debt. However, some weak spots remained. One of these concerns the US current account deficit, which continued to deteriorate throughout the upturn. Another is connected with risks that lie in the US household sector, given the heavy level of indebtedness.

US CURRENT ACCOUNT AND FINANCING

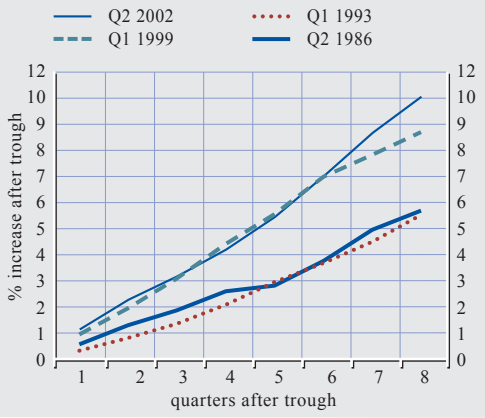
Large and growing US current account deficits have generally been perceived as posing a significant risk for global financial stability, at least since 2000. This is partly because of the pressures these deficits have placed on international capital markets. In addition, their accumulation has implied a sizeable increase in US external indebtedness, thereby raising questions about medium-term sustainability.

The US current account deficit continued to rise in the first half of 2004, recording another historical high of USD 166.2 billion in Q2 2004, equivalent to 5.7% of GDP. The changes in sectoral balances underlying this included continuously deteriorating US fiscal balances and a widening of the household sector deficit (see Chart 1.2). A widening of the household sector deficit was a pattern not seen in earlier episodes of current account deficit widening.

There has been little indication of any difficulty in financing the US current account deficit. The overall financing requirements were more than matched by net foreign purchases of US bonds and notes (see Chart 1.3). However, net direct investment to the US became negative after mid-2002, and foreign investors continued to show their reluctance to place funds in the US equity market after the corporate malfeasance-induced turbulence of 2002. Hence, the underlying

Chart 1.1 Recoveries in world real GDP excluding the euro area

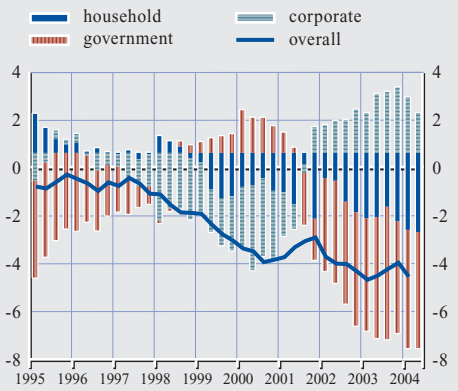
(cumulative % growth from trough)



Source: ECB estimations.
Note: The left-most point denotes the quarterly growth rate at the trough.

Chart 1.2 Net lending/borrowing of the US economy

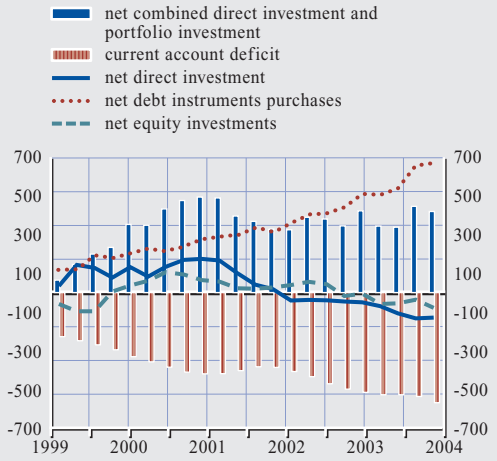
(Q1 1995 – Q2 2004, % of GDP)



Source: US Bureau of Economic Analysis (BEA).
Note: The net lending/borrowing situation equals gross saving (net saving plus consumption of fixed capital) minus gross investment. The contributions of the three domestic sectors do not sum to the total owing to capital account transactions and statistical discrepancies.

Chart 1.3 Financing of the US current account deficit

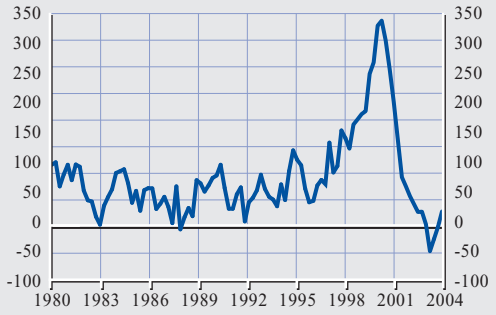
(Q1 1999 – Q2 2004, USD billions, four-quarter cumulated flows)



Source: Bank for International Settlements (BIS).
Note: Portfolio investment excludes money market instruments.

Chart 1.4 US non-farm, non-financial corporate sector financing gap

(Q1 1980 – Q2 2004, USD billions)



Source: US Federal Reserve Board.
Note: The financing gap equals capital expenditure-less internal funds and inventory valuation adjustments.

financing conditions seemed to tighten, while the sustainability of the US current deficit appears to depend on ongoing demand for US public sector debt instruments.

Sizeable purchases of US Treasury securities by Asian monetary authorities have contributed to financing the widening of the US current account deficit. Although preliminary figures compiled by the US Bureau of Economic Analysis showed a decline in foreign official investment from USD 127.9 billion in Q1 2004 to USD 73.9 billion in Q2 2004, foreign purchases of official assets in the US were still up by 18.9% for this period when compared with the quarterly average recorded in 2003.

US CORPORATE SECTOR BALANCES

The financial condition of US corporations can have a bearing on the financing costs faced by large euro area firms in global capital markets, both through competing demands for funds as well as in the global pricing of corporate credit risk.

The growth of non-financial corporate debt slowed down in 2003 to a pace not seen since the early 1990s (see Chart S1) because of efforts made to restructure balance sheets. At the same time, the corporate sector became a net lender of funds. The financing needs of US corporations were significantly reduced after 2000 (see Chart 1.4). This was mainly achieved through labour shedding and cutting back on investment. As a result, the balance sheets of firms were strengthened by four consecutive quarters of financing surpluses, which was unusual by historical standards. Notwithstanding the economic pick-up, it was not until the second quarter of 2004 that US corporations' financing needs, both for inventories and investment, began to exceed their cash flow.

Declining long-term interest rates together with narrowing corporate bond spreads apparently encouraged firms to raise the proportion of longer maturity debt on their balance sheets. By stepping up the issuance of corporate bonds (see Chart 1.5), vulnerabilities to short-term interest rate rises were apparently lessened. However, there are indications that large firms made use of the interest rate swaps markets to transform

Chart 1.5 Debt structure of the US non-farm non-financial corporate sector

(Q1 1980 – Q2 2004; % of credit instruments)

Source: US Federal Reserve Board.

long-term liabilities into short-term obligations at lower interest rates. Hence, it remains to be seen whether in fact the increased share of long-term liabilities has translated on a one-for-one basis into lowered short-term interest rate sensitivity.

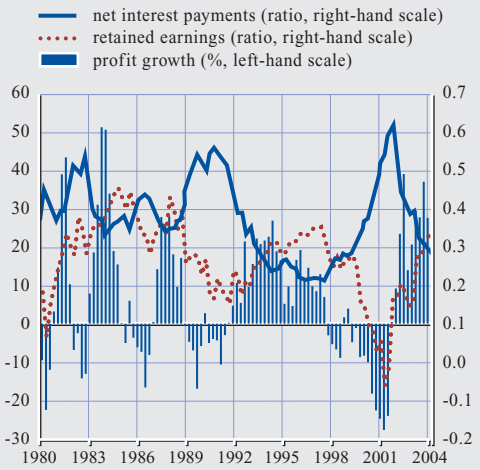
By the first quarter of 2004, profits exceeded the levels they had reached in mid-1997 for the first time. The strength of profitability was underpinned not only by the steps taken by firms to enhance cost efficiency, but also through a notable decline in the share of operating income needed to make interest payments on debt (see Chart 1.6). Retained earnings and corporate sector cash flows strengthened considerably as a result, leaving the sector highly liquid.

Improving profitability and balance sheet restructuring has meant that US corporate sector net worth began to improve in 2003, thereby indicating an improved capacity to repay debt (see Chart S2).

All in all, credit risks posed by the US corporate sector appear to have eased significantly since late 2003. Balance sheet repair has been acknowledged by credit rating agencies, and the credit downgrade-to-upgrade ratio has returned to levels last seen in the late 1990s (see Chart 1.7). The recent rise in the gap between corporate capital expenditures and internal funds may be an indication that US business confidence has returned towards normal levels. Given relatively

Chart 1.6 Growth of US corporate profits and shares of interest payments and retained earnings in profits

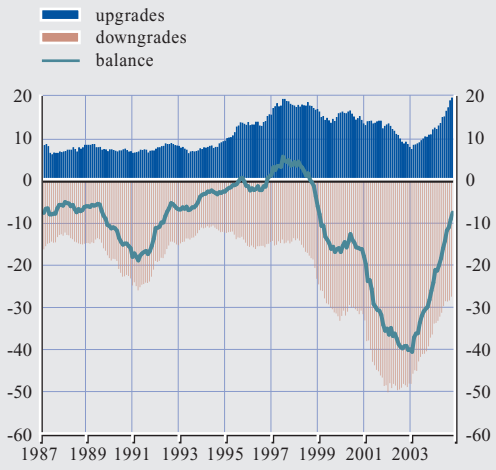
(Q1 1980 – Q2 2004)



Source: US Bureau of Economic Analysis (BEA).
Note: Profits are non-financial corporate pre-tax profits.

Chart 1.7 US corporate sector rating downgrades, upgrades and balance

(Jan. 1987 – Oct. 2004, 12-month moving average, number)



Source: Moody's.

liquid balance sheets, corporate sector needs for external funds, even though rising, could remain subdued for some time to come. This augurs well for the credit risk outlook, but there are nevertheless some risks. Just as profits were bolstered by declining interest rates after 2000, the recent upturn in short-term rates can be expected to cut into US corporate sector profitability. The significance of this will depend among other factors upon the short-term interest rate sensitivity of US corporate sector balance sheets. There is some degree of uncertainty on this, given the ways in which corporations are thought to have transformed the maturity of their debts through interest rate swap markets. There are also some other risks facing US firms. In particular, already troubled energy-intensive and energy-sensitive industries – including airlines and the automobile industry – face risks to their cost bases associated with the strength of oil prices.

US HOUSEHOLD BALANCES

The debt-to-disposable income ratios of US households continued to rise after late 2003, and had scaled new heights by mid-2004 (see Chart S3). High levels of household gearing, primarily resulting from mortgage borrowing, entails risk from rising interest rates or from the loss of employment, and ultimately poses risks for US banks and holders of mortgage bonds.

A substantial proportion of outstanding US mortgage debt – between 85% and 90% – is thought to be contracted at relatively low fixed interest rates following unprecedented mortgage refinancing in 2003, and is thus sheltered from interest rate increases.[1] However, the share of adjustable rate mortgages (ARMs) in new mortgages began to rise significantly in 2004, surging to 40% of new mortgages by June 2004, compared with around 12% in 2001, according to Mortgage Bankers Association data. Typically, the share of ARMs has tended to decline with the level of interest rates on long-term mortgages. Hence, this rise could be a sign that some US households, judging obligations on fixed-rate mortgages to be too challenging, may have opted for ARMs, given better affordability in the short term.

The value of US household assets also grew after late 2003, albeit less rapidly than liabilities. Despite home equity extraction, most of the gains were in the value of real estate, as US house prices increased by a further 10% year-on-year in the second quarter of 2004. Mutual funds and savings accounts also contributed positively to the increase in net worth.

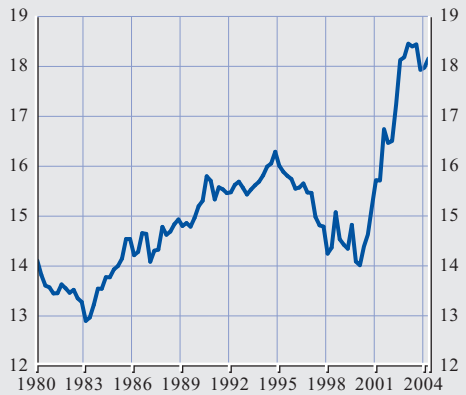
The faster growth of household liabilities than assets left the ratio between the two close to record heights in mid-2004 (see Chart 1.8). As a proportion of household disposable income, net worth – assets less liabilities – represented 537% in Q2 2004. However, this still remained lower than the level of 618% of disposable income reached at the peak of the stock market boom.

There are few indications that US households have been facing challenges in meeting the obligations on their debts, with perhaps the exception of those that rent their accommodation. The ratio of household obligations to disposable

1 See Bernanke, B. (2004), *"The Economic Outlook and Monetary Policy"*, remarks at the World Economy Laboratory Spring Conference, Washington, DC, 23 April.

Chart 1.8 US household liabilities to assets ratio

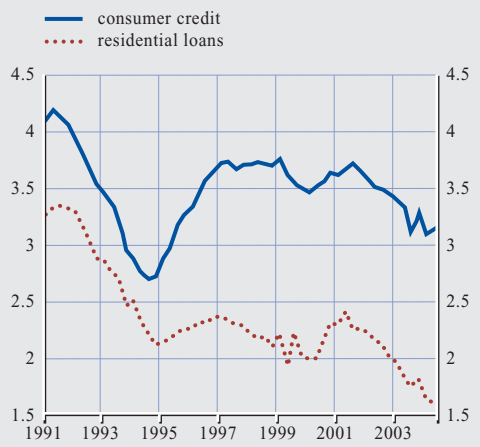
(Q1 1980 – Q2 2004, %)



Source: US Federal Reserve Board.

Chart 1.9 US household delinquency rates on loans

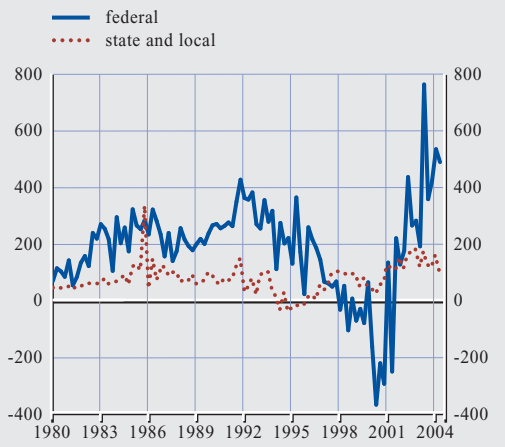
(Q1 1991 – Q2 2004, % of outstanding loans, all banks)



Source: US Federal Reserve Board.

Chart 1.10 Net increase in liabilities of the US public sector

(Q1 1980 – Q2 2004, USD billions)



Source: US Federal Reserve Board.

income has been declining, as have household delinquency rates on loans (see Chart 1.9).

Overall, US households appear to face risks on both sides of their balance sheets. The strength of house price inflation – which has outstripped growth in both rents and disposable incomes – has left questions about their vulnerability to rising interest rates. In addition, on the liability side, high growth in short-term consumer loans and the rising share of ARMs may be a cause for concern, as it raises the short-term interest rate sensitivity of household balance sheets. One mitigating factor is that most ARMs are hybrid mortgages, with long initial fixation periods. Moreover, at an aggregate level, household debt burdens should be sustainable if faced with an upturn in interest rates: according to the *US Survey of Consumer Finances*, higher-income households – often with high net worth – hold a disproportionately large share of debt. Nevertheless, lower-income households tend to hold a higher proportion of adjustable rate debt.

US FISCAL IMBALANCES

A continuous easing of fiscal policy led the US public finances to deteriorate after 2000. From a sizeable surplus, the US fiscal accounts moved into deficit in mid-2001, reaching 4.5% of GDP by the second quarter of 2004. Whereas fiscal surpluses from the late 1990s onwards had led to the repurchasing of bonds by the US Treasury and had set a trajectory for a significant decline in the US public sector debt-to-GDP ratio, the expansion of the deficit quickly raised it from around 56% of GDP in the second quarter of 2001 to more than 61% in the second quarter of 2004 (see Chart S4). By raising the financing needs of the public sector (see Chart 1.10), the strength of federal bond issuance poses risks of both crowding out US private sector debt issuance and of forcing global long-term interest rates upwards.

Although US public debt-to-GDP ratios remain well below the heights reached in the mid-1990s, the near-term prospects of an improvement in the US federal fiscal balance remain uncertain.

ECONOMIC OUTLOOK AND RISKS IN NON-EURO AREA EU COUNTRIES

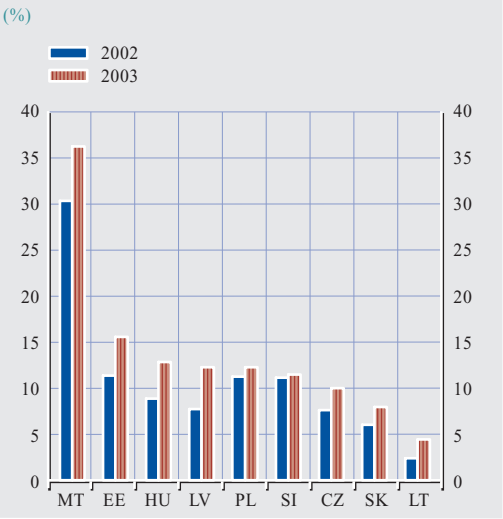
In the United Kingdom, following firm economic growth in 2003, the pace of economic activity remained strong in the first and the second quarters of 2004. Growth continued to be driven by domestic demand, with investment playing

a major role. Looking ahead, real GDP growth is expected to remain vigorous and above trend, at least in the near term.

In Sweden and Denmark output growth strengthened in the second quarter of 2004. Gains in economic activity were relatively strong in Sweden and somewhat more moderate in Denmark.

Following robust growth in 2003, output growth in the new Member States (NMSs) strengthened further in the first quarter of 2004. The Baltic countries, Poland and Slovakia recorded the highest rates of real GDP growth in the first quarter of 2004. Preliminary GDP estimates already released for several NMSs generally point towards a continuation of robust output growth in the second quarter.

Chart 1.11 Household debt-to-GDP ratios in the new Member States of the EU



Sources: ECB, Banking Supervision Committee (BSC) and national central banks.

BALANCE SHEETS OF NON-FINANCIAL SECTORS IN NON-EURO AREA EU COUNTRIES

In the UK, increasing household and corporate sector indebtedness has led to some concerns about credit risks. Nevertheless, given the outlook for households' income and employment, default rates on secured lending are likely to remain low if interest rates follow the path priced into market yield curves.

Turning to the sectoral balance sheets of the new Member States, a considerable increase in household indebtedness occurred over recent years (see Chart 1.11). Rapid growth in household borrowing continued in the first half of 2004, with annual growth rates of more than 30% in six countries. Notwithstanding the rises in household debt-to-income ratios in recent years, the level of households' indebtedness remained well below the euro area average with the exception of Malta. Financial stability risks are also mitigated by the fact that rising household indebtedness has been mainly driven by the accumulation of collateralised (mortgage) debt. As for potential risk factors, historically low levels of interest rates as well as fixed or quasi-fixed exchange rate regimes in some countries may have been important driving factors underlying the strength of credit demand. Thus, a potential reversal in nominal convergence or unexpectedly adverse movements in exchange rates could entail a significant deterioration in households' debt servicing ability.

SOURCES OF RISK AND VULNERABILITY IN EMERGING MARKET ECONOMIES

Macroeconomic performances across emerging market economies (EMEs) were robust in 2004. Headline GDP growth accelerated in all major regions with the exception of China, where there was a slight deceleration. The economic upturn in EMEs was supported by several factors, including benign international financing conditions, continued high international prices for key export commodities (notably oil, as well as non-ferrous metals and some agricultural commodities), and increased external demand from mature economies. The maintenance of robust policy frameworks designed to enhance investor confidence (such as fiscal restraint in Brazil and Turkey) also helped.

Notwithstanding some turbulence in the Russian banking sector (see Box 1), robust economic performance contributed to the reducing of external vulnerabilities in EMEs. Relative to 2001, current accounts in almost all key EMEs had moved into surplus by September 2004, with the exception of Mexico and Turkey (see Table S1). Healthy export receipts for various commodities – such as oil in Russia and Venezuela, and soy beans in Argentina and Brazil – were key to this improvement. Import coverage of foreign reserves also improved generally, although it remained lower in Mexico and Turkey. Total external debt burdens as a share of GDP also declined, except in Argentina and Venezuela. Many EMEs, such as Brazil, Mexico, Venezuela and Russia, additionally curbed their ratios of short-term debt to foreign exchange reserves. This notwithstanding, as this ratio still remained close to or even above 100% in Argentina and Turkey, some vulnerabilities remained in these countries.

The EME outlook for 2005 remains positive, although three downside risks were coming to the fore in late 2004. First, across emerging markets, risks continued to stem from the potential vulnerability to an upturn in global interest rates. Second, risks persisted across emerging markets associated with the possibility of a disorderly correction of global current account imbalances. Third, if sustained in 2005, the sharp upturn in oil prices left the potential to heighten upward inflationary pressures, particularly in non-oil exporting emerging economies. Insofar as the euro area is concerned, possible risks stemming from emerging markets appear to be contained.

CHINA AND GLOBAL IMBALANCES

By late 2004, China accounted for around 24% of the US merchandise trade deficit, up from its 22% share in 2002, and still the largest share of any single country. While China's trade surplus with the US increased during 2004, its trade deficit with the rest of Asia increased by more. As a result, China's overall trade surplus shrank in 2004 (see Chart 1.12).

Since 2003, pressures on the Chinese renminbi (RMB) to appreciate vis-à-vis the US dollar (USD) have waxed and waned. The main factor underlying upward pressure on the RMB has not been China's trade surplus, but instead short-term capital inflows attracted by a booming domestic economy, wide interest rate differentials with the US, and speculation of a possible RMB appreciation. These net inflows of "hot money" resulted in the People's Bank of China accelerating its pace of foreign exchange reserve accumulation in order to maintain a tight connection between the RMB and the USD. Heavy intervention in the foreign exchange market in turn boosted domestic liquidity and gave further impetus to the existing domestic investment and credit boom.

After April 2004, administrative measures designed to prevent a future hard landing as a result of an overheating economy gradually brought about a deceleration in investment and credit growth. Partly reflecting the government's resolve to slow down the economy, expectations of an RMB appreciation against the USD – gauged by patterns in non-deliverable forward

Chart 1.12 China's trade balance

(Jan. 2002 – Aug. 2004, USD billions)

Source: CEIC.

Box 1 Turbulence in the Russian banking sector

In 1998 the Russian economy was hit by a severe financial crisis which had strong repercussions on world financial markets. There was a sharp decline in asset prices and a drying up of liquidity in a number of markets, which triggered a widespread policy response. Since then, Russia has seen an unprecedented period of economic growth and monetary stabilisation. These developments spurred rapid growth in the Russian banking sector after 1999. In October 2003 Moody's granted Russia its lowest investment grade status. As a result, Russian borrowers regained access to international capital markets, bond issuance doubled in 2003 when spreads on Russian securities reached record lows, and claims of BIS reporting euro area banks on Russian borrowers rose substantially (see Table S4). This Box describes the events that triggered the recent spate of turbulence in the Russian banking sector.

Although the Russian banking sector grew significantly after 1999, many institutions remained small and undercapitalised. They also continued to be dominated by poor governance structures that were lacking in transparency, with many institutions mainly serving as the financial arm and treasury departments of their owners. Thus, while bank lending to the private sector expanded, low levels of interbank lending persisted, indicating a still substantial lack of trust among financial institutions.

In the early summer of 2004, a crisis of confidence struck the private domestic banking sector, reflecting the structural weaknesses that had persisted since the 1998 crisis. It was triggered by the Bank of Russia's decision to withdraw the license of a medium-sized bank on charges of money laundering in mid-May. As rumours spread about the possibility that the licenses of other banks could be withdrawn, tensions spread into the interbank market. Overnight interest rates rose considerably, and for a few weeks there was basically no activity in the market. Instead, lending took place almost solely on a bilateral basis.

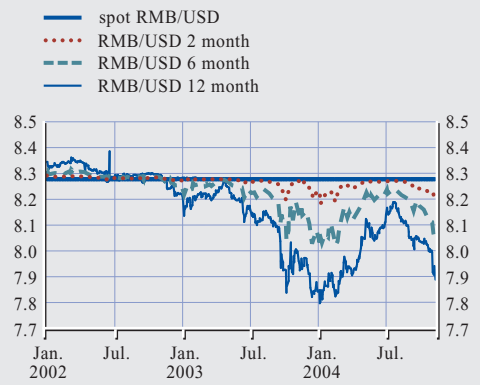
The turbulence reached the deposit market in early July, when Guta Bank, the 22nd largest bank in the country, was struggling to meet payments to customers. As a result, depositors began to abandon the private Russian banks, turning instead to the Bank of Russia-owned Sberbank and to the state-owned Vneshtorgbank as well as shifting to cash holdings.

The Bank of Russia responded by reducing mandatory reserve requirements from 7% to 3.5% in order to boost banks' liquidity. It also provided a loan to finance the acquisition of Guta Bank by Vneshtorgbank. In addition, Sberbank was requested to stand ready to grant short-term loans in the interbank market. Russia's parliament, the Duma, extended deposit insurance for all deposits up to RUB 100,000 (approximately EUR 2,850) in banks that had either failed or had declared insolvency since December 2003.

The Bank of Russia's measures effectively put an end to the bank run, and had a positive effect on conditions in the interbank market. Overnight interest rates declined to pre-crisis levels. In the medium to long-term, authorities face the challenge of rebuilding the trust of Russian citizens in private domestic banks while, at the same time, proceeding with policies aiming at sectoral restructuring and consolidation.

Chart 1.13 Chinese renminbi/US dollar spot and forward rates

(Jan. 2002 – Nov. 2004)



Source: JP Morgan Chase.

Chart 1.14 US six-month TED spread

(Jan. 1999 – Nov. 2004, basis points)

Source: Bloomberg.
Note: The TED spread is the difference between six-month money market and Treasury bill rates.

prices – also moderated significantly in the course of 2004 (see Chart 1.13). The easing of appreciative pressures on the RMB was also reflected in a clear downward trend in the pace of reserve accumulation growth after the end of 2003.

On 28 October 2004 the People's Bank of China raised interest rates for the first time in nine years with the aim of complementing previous tightening measures, adjusting for negative real interest rates, and paving the way for a gradual transition towards a more market-based monetary policy implementation framework.

1.2 KEY DEVELOPMENTS IN INTERNATIONAL FINANCIAL MARKETS

US MONEY MARKETS

US monetary policy rates were lowered to 1% in June 2003, the lowest levels seen since the late 1950s, and they remained at these levels until mid-2004. On 30 June 2004, the Federal Reserve began to remove this monetary policy accommodation as evidence became clear of a strengthening US economy and, particularly, of improving labour market conditions. In total, by mid-November 2004 the Federal Reserve had increased interest rates four times, amounting to 100 basis points to reach 2%.

By mid-November 2004, market participants were generally expecting a continuation of the measured pace of rate hikes for the months to come. In this vein, Federal Fund futures contracts were nearly fully pricing another interest rate hike of 25 basis points by the end of 2004, with the Federal Fund target rate expected to reach 2.75% by mid-2005.

Financial market reactions to the tightening of US monetary policy were generally benign, especially when compared with the beginning of the 1994 tightening cycle. The communication strategy of the Federal Reserve, which had prepared the financial markets well in advance for upcoming rate hikes, appears to have been an important factor in explaining the moderate reaction.

In US money markets, the so-called TED spread – the difference between uncollateralised money market interest rates and risk-free Treasury bill rates – can provide an indication of money market participants' perceptions of counterparty credit risks (see Chart 1.14). Compared with the high levels this spread reached in 1999, when concerns about money market liquidity shortages in the

transition to the new millennium were acute, this spread narrowed significantly after 2001. The principal explanation appears to have been the easing of US monetary policy from early 2001 onwards. The recent upturn in US official interest rates, however, left the spread unperturbed. This suggests that market participants considered the financial position of the main counterparties in the US money markets to be robust, and that they were well prepared for the upturn in the Federal Funds rate.

NON-EURO AREA EU MONEY MARKETS

Outside the euro area, developments in monetary policy interest rates in the rest of the EU were rather diverse. Some countries lowered official rates throughout 2004 (e.g. Sweden and Slovakia), whereas others (e.g. the Czech Republic and the UK) raised their monetary policy rates. For example, the Bank of England, which started its tightening cycle in November 2003, had by mid-November 2004 raised the base rate by a total of 125 basis points to 4.75%.

US BOND MARKETS

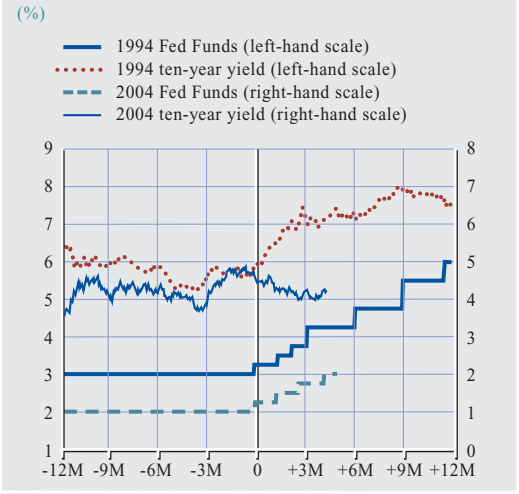
Long-term US government bond yields oscillated within a relatively narrow range between late 2003 and November 2004, reaching a low of 3.68% in March and a high of 4.87% in June. By mid-November, ten-year yields stood slightly above 4.20%. Trends in US ten-year government bond yields following the increases in the Federal Funds rate after June 2004 stand in contrast to the pattern seen after February 1994, the last time significant monetary policy stimulus began to be withdrawn (see Chart 1.15). Indeed, in 1994 a substantial bond market correction occurred across the world following a change in the direction of US monetary policy. This correction put pressure on some parts of the global financial system and triggered a number of prominent financial failures. By contrast, ten-year yields had declined significantly by mid-November 2004, also contrasting with the expectations that had been priced in to Treasury bond futures at the beginning of 2004, when a gradual upturn in yields had been foreseen.

In the medium term, a close link between the level of ten-year nominal bond yields and consensus expectations of nominal GDP growth over the following ten years might be expected, allowing for risk premia. However, after late 2002, a sizeable gap opened up and persisted throughout most of 2004. In the past, there was a subsequent upturn when US bond yields fell below ten-year nominal growth expectations, as in 1993 and 1998 (see Chart 1.16).

According to monthly surveys conducted by Merrill Lynch, institutional investors consistently shared a view after October 2003 that global long-term bond yields had dropped below intrinsic values. The October 2004 Global Fund Manager Survey found that a net 55% of equity fund managers and 53% of bond fund managers considered global bond markets to be overvalued.[2]

2 See Merrill Lynch (2004), *"Global Fund Manager Survey – Investors Dust Off Their Chinese Amulets"*, 19 October.

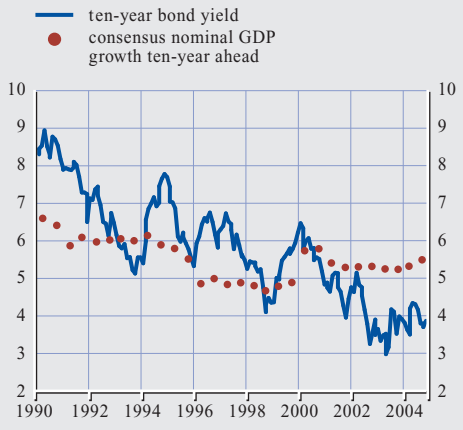
Chart 1.15 US ten-year Treasury yields and Fed Funds target rates in 2004 vs. 1994



Source: Bloomberg.

Chart 1.16 US ten-year bond yield and consensus ten-year nominal GDP growth expectations

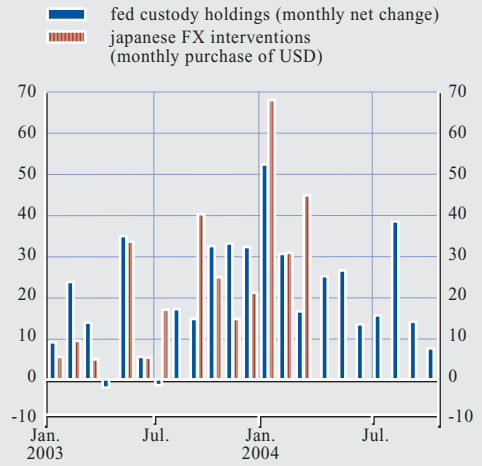
(Jan. 1990 – Nov. 2004, %)



Sources: ECB and Consensus Economics.

Chart 1.17 Foreign exchange purchases by the Bank of Japan and custody holdings with the US Federal reserve

(Jan. 2003 – Oct. 2004, USD billions)



Sources: US Federal Reserve Board and Japanese Ministry of Finance.

There appear to be several factors that have held US bond yields at relatively low levels. From a macroeconomic viewpoint, delays in improving labour market conditions, coupled with low inflationary pressures and a concomitant moderation of interest rate hike expectations, have all played important roles. Furthermore, the surge in oil prices in 2004 may have weighed on expectations of global growth. However, several technical factors may also have played important roles.

Foreign inflows into the US bond market grew in importance after 2002 and, although difficult to quantify their effect, this may have contributed to holding yields down. There are some indications that part of these flows reflected a recycling of proceeds from foreign exchange market interventions by Asian central banks which were aimed at preventing their currencies from appreciating against the US dollar. For instance, after mid-2003 there were sizeable increases in custody holdings of US Treasury and US agency bonds with the US Federal Reserve on behalf of foreign official and international accounts (see Chart 1.17). Cumulatively, between January 2003 and November 2004, the total holdings of these bonds by foreign and international accounts rose by USD 450 billion, of which USD 365 billion was in US Treasuries.

Custody holdings continued to increase even after the Japanese authorities ended their interventions in the foreign exchange markets after mid-March 2004. To some extent, continued purchasing of US Treasuries may have reflected lags between intervention transactions and Treasury security purchases.[3] However, it cannot be ruled out that inflows from other official Asian accounts might have continued over the summer. For instance, the foreign exchange reserves of the Peoples Bank of China – the second-largest holder of foreign exchange reserves globally – increased by an average of USD 11 billion per month in the first six months of 2004.

The weight of foreign involvement in the US Treasury market can be gauged by the

3 It may be that the intervention proceeds were first invested in money market instruments, which are not reflected in the Federal Reserve data, and were only subsequently employed for securities purchases in later months.

activities of so-called indirect bidders – a group that mainly includes foreign and international official institutions such as central banks – in US Treasury auctions.[4] Increasing participation of indirect bidders in US Treasury auctions became evident after mid-2003, and their share in the overall allotment stood above 50% on five occasions after June 2004 (see Chart 1.18).

Foreign purchases of US Treasury and agency bonds also absorbed a growing share of new issuance, particularly in 2004. In the first half of the year, foreign investors – mostly central banks – absorbed more than the total increase in net outstanding amounts (see Chart 1.19). Private foreign purchases were also significant, accounting for 44% of overall foreign purchases of these bonds.

One of the most important factors that appears to have weighed on yields was investors' hunt for yield. With US money market rates remaining below 2% for almost three consecutive years, investors sought ways to enhance portfolio returns by entering carry trades in the bond market, where funds are borrowed at short maturities and invested at longer-term maturities.[5] Carry trades undertaken by hedge funds, banks and other financial intermediaries generally employ leverage. While they may be motivated by the needs of financial institutions to hedge short fixed income exposure, they can also reflect speculative positioning.

While there is no simple way to judge the magnitude and importance of carry trades, secured financing by US primary dealers can provide a yardstick for liquidity provision by US financial intermediaries.[6] The direction of

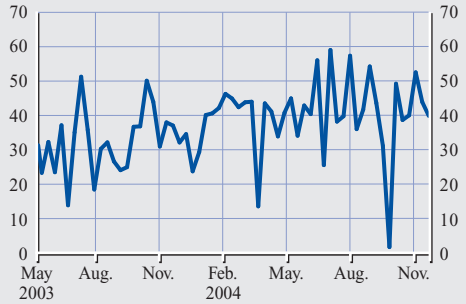
4 Other participants in US Treasury auctions are primary dealers and direct customers. The latter are primarily US-based broker-dealers who purchase bonds for their own account or for customers.

5 Carry trades in their most rudimentary form involve purchasing one security with more yield, or carry, than the one that is sold. They can involve the short-term funding of positions in longer-dated Treasuries, investment-grade and high-yield corporate debt, emerging market debt, convertible bonds and mortgage-backed securities.

6 Net secured financing measures the net amount of funds that primary dealers borrow through all fixed income security financing transactions.

Chart 1.18 Share of indirect bidders in US Treasury auctions

(May 2003 – Nov. 2004, %)



Source: US Treasury.

Chart 1.19 Issuance of and changes in foreign holdings of US bonds

(1999 – 2004, USD billions)

Source: US Federal Reserve Board.
Note: Data for 2004 only cover the first half of the year and are annualised.

speculative positioning in the bond market can also be gauged by the activity of participants in futures markets (see Box 2). Leverage and speculation are frequently intertwined. Many institutional investors are constrained by investment policies that either limit or prohibit leverage. However, proprietary trading desks at investment banks and unregulated hedge funds typically have mandates to leverage their positions.

In early 2003, US official interest rates were at 45-year lows with little expectation of an increase. The market yield curve was relatively steep and long-term rates were apparently held down, perhaps by the weight of foreign inflows to the market. Given this setting, the risks associated with carry trades may have seemed very low to market participants, which possibly explains why signs of leverage building up in the bond market became apparent in the course of the year (see Chart 1.20). In tandem, participants in bond futures markets increasingly took speculative long positions, betting that long-term rates would not rise or perhaps would fall even further.

Given their leverage, carry trades built up in ample amounts can leave bond markets vulnerable to shocks. For instance, a sufficient increase in borrowing costs, a drop in the price of the acquired asset, or both, can quickly render such positions unprofitable. Any price deterioration could be amplified, particularly if many players – or just one very large one – attempt to abandon the strategy simultaneously. While there were some concerns in early 2004 that US bond markets were vulnerable to a disturbance such as this, turbulence was avoided, apparently largely because the Federal Reserve's signalling of its monetary policy intentions provided market participants with sufficient time to unwind leverage and to reposition themselves. Nevertheless, leverage and speculative long positioning quickly built up again after August, which possibly explains the relatively muted reaction of the bond market following the increase in US official interest rates.

Chart 1.20 Indicators of positioning and leverage in the US bond market

(Nov. 2001 - Oct. 2004, four-week moving average)

Sources: Federal Reserve Bank of New York and Commodity Futures Trading Commission (CFTC).

Looking ahead, the extent of foreign participation in the US bond markets raises questions about the risks that these positions could, at some point, be unwound. Should foreign purchases come to a halt, it seems unlikely, all things being equal, that upward pressure on US bond yields could be avoided. This notwithstanding, there are few clear indications that a rebalancing of official bond portfolios is imminent, not least given the price risks they would entail. Moreover, indications that institutional investors may be underweight in bonds relative to their benchmarks could be a mitigating factor for the bond market.

FOREIGN EXCHANGE DEVELOPMENTS

Towards the end of 2003 and into early 2004, the US dollar remained under continued downward pressure (see Chart S7). This was mainly because the attention of market participants continued to be drawn to the risks of sharp shifts in global capital flows, given the large and growing US current account deficit. Official intervention by Asian authorities, aimed at avoiding a sharp appreciation of exchange rates vis-à-vis the US dollar, continued for much of this period. Japan,

China, Korea and Taiwan all actively intervened to keep their exchange rates from rising against the US dollar. This activity meant that because of its tight connection to the US dollar, the Chinese renminbi also fell against virtually all other currencies along with the dollar until early 2004.

Box 2 Bond market developments and speculative positioning in the futures markets

While longer-term trends in financial markets are ordinarily underpinned by macroeconomic fundamentals, speculative activity can play an important role in driving short-term trends and volatility. When speculative activity brings about a positioning of the market – whereby investors gain if the market moves in the expected direction – the vulnerability of the market to shocks and the potential for disruption is typically higher than under normal conditions. This can have important financial stability implications if the institutions behind the positions are highly leveraged and systemically important. This Box assesses the role of speculative activity in US bond markets.

For government bonds, market participants can take leveraged positions – involving little money relative to the size of the position – by buying or selling futures contracts. Such contracts require one participant to deliver and another to accept a government bond at a predefined date and at a pre-agreed price. Participants can use these markets either to hedge their interest rate exposures or to speculate. For instance, participants who take speculative short positions in futures contracts on government bonds usually expect bond prices to fall (i.e. bond yields to rise). If their expectation is correct, they will realise a profit either by buying back the futures contract at a lower price or by purchasing the bond in the cash market and delivering it to the counterparty to the futures contract that was initially sold at a higher price.

A widely quoted and frequently tracked source of information on speculative activity in the bond market is the weekly data provided by the US Commodity Futures Trading Commission (CFTC), an independent agency that was created by the US Congress in 1974.[1] The CFTC aims at protecting market users and the public from fraud, manipulation and abusive practices related to the trading of futures and options, and also at fostering open, competitive and financially sound futures and options market conditions. It is mandated to regulate futures and options markets in the US and can also impose reporting requirements on market participants. Based on these reporting requirements, the CFTC compiles data on short and long positions of participants in US futures markets including bond futures. These data are published each Friday and state the positions that were held on the preceding Tuesday. The so-called reporting firms (clearing members, futures commission merchants and foreign brokers) file daily reports with the CFTC showing the futures positions of traders that hold positions above specific reporting levels. The aggregate of all traders' positions reported to the Commission usually represents 70-90% of all positions, or the total open interest, in the market.

When an individual reportable trader is identified to the CFTC, the trader is classified as being either "commercial" or "non-commercial", depending on the use of the futures contract. Traders that use futures contracts primarily for hedging activities are classified as commercial, while all others that are not taking positions as a hedge are classified as non-commercial. The latter

1 For foreign exchange markets, there is evidence that data collected by the CFTC on speculative activity can explain much of the variance in foreign exchange rates. See, for instance, Klitgaard, T. and L. Weir (2004), *"Exchange Rate Changes and Net Positions of Speculators in the Futures Markets"*, Federal Reserve Bank of New York Economic Policy Review, May.

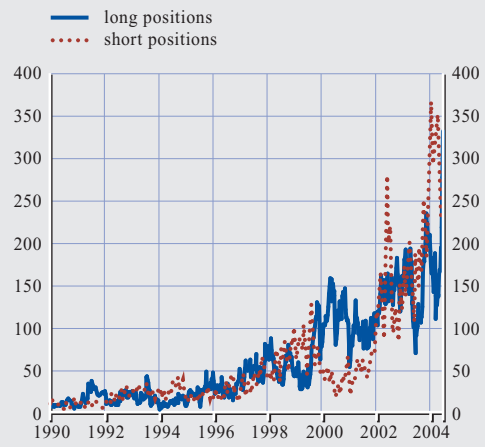
category typically includes speculators, who act on their own views about the market's likely short-term direction. Even though every purchase of a futures contract is matched by a sale so that the sum of all positions in the market is always zero, the speculative non-commercial data are thought to be revealing about short-term market positioning. This is because the commercial positions, being hedges, are usually less likely to be reversed in the short run.

The number of non-commercial positions in ten-year US Treasury futures grew significantly after 1990, but soared after 2000 (see Chart B2.1). As speculative activity growth outpaced that of commercial positioning, the share of speculative positions in total positions rose, oscillating between 15% and 20% for much of the time after January 2001 (see Chart B2.2). Net positioning can shed light on the direction in which speculators expect the market to move over the short term. After stock markets began to tumble in 2000, long positioning became substantial and bond yields were driven to historical lows. From late 2003 until mid-2004 the market built up significant short positions, as non-commercial accounts became positioned for an increase in long-term US yields. Net positioning turned positive again after August 2004 (see Chart B2.3). This repositioning did not translate into exceptionally high volatility in ten-year US Treasury yields.

In order to determine the importance of speculative positioning in driving bond market movements, a simple exercise is to measure the degree of correlation between changes in bond yields and changes in non-commercial positioning. Based on a sample of weekly data from the beginning of 2000, there appears to be little correlation between the two (see Chart B2.4). If short-term positioning was a significant factor in driving movements in ten-year US Treasury yields, then the data points should be concentrated in the upper left and the lower right quadrants, with increases (decreases) in net long positions being associated with lower (higher) government bond yields. This is however not the case, and it contrasts markedly with the findings of Klitgaard and Weir (2004) for the foreign exchange markets. This finding suggests that speculative

Charts B2.1 Non-commercial positioning in ten-year US Treasury futures

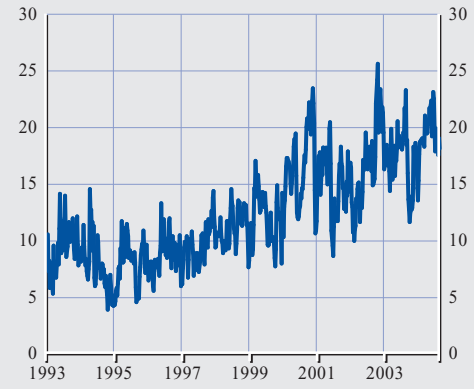
(thousands of contracts)



Source: Commodity Futures Trading Commission (CFTC).

Charts B2.2 Share of non-commercial positions in total positions of ten-year US Treasury futures

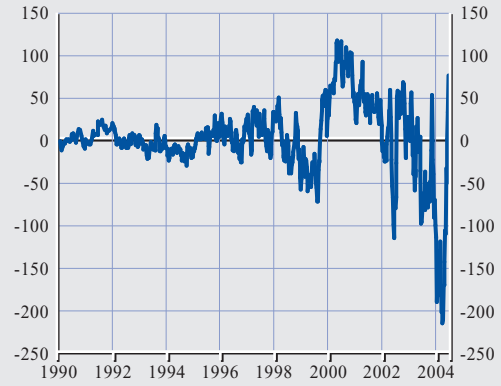
(% share)



Source: Commodity Futures Trading Commission (CFTC).

Charts B2.3 Net non-commercial positions in ten-year US Treasury futures

(thousands of contracts)



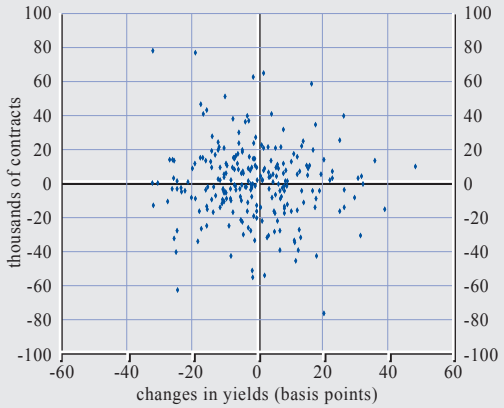
Source: Commodity Futures Trading Commission (CFTC).

positioning does not play an important role in driving US bond yields, perhaps because commercial positioning – with longer-term investment horizons – dominates positioning in the ten-year US Treasury market.

There is some evidence that from January 2000 onwards speculative activity has been associated with the level of bond yields (see Chart B2.5). As bond yields have fallen, speculative activity betting on a rise in yields has tended to build up. Likewise, when bond yields have risen, speculators have tended to lengthen their positions. Although the association is rather loose, this suggests that speculators, at least on average over the time period considered, have not tended to drive the US bond market in a destabilising way.

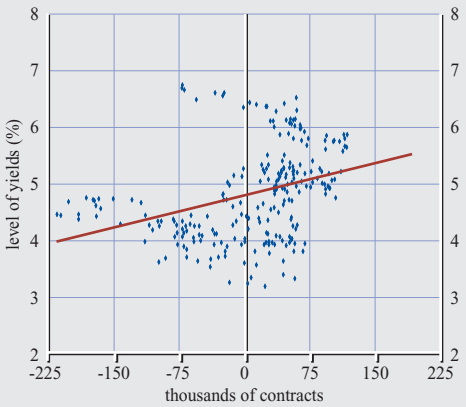
Charts B2.4 Changes in non-commercial positions and ten-year US Treasury yields

(weekly changes in net long positions vs. changes in yields Jan. 2000 - Oct. 2004)



Charts B2.5 Levels of non-commercial positions and ten-year US Treasury yields

(changes long/short positions yield levels, Jan. 2000 - Oct. 2004)



Sources: Commodity Futures Trading Commission (CFTC) and ECB calculations.

Later on, from the early spring onwards, the US dollar recovered somewhat as the economic outlook in the US improved and expectations firmed that the Federal Reserve would tighten monetary policy. Against this background, intervention activity by Japanese authorities came to a halt after March. However, towards the end of 2004, the focus of market participants on US external imbalances returned. Against this background, there was renewed downward pressure on the US dollar. By mid-November 2004, in effective terms the US dollar had dropped below the low-points reached in the early part of the year.

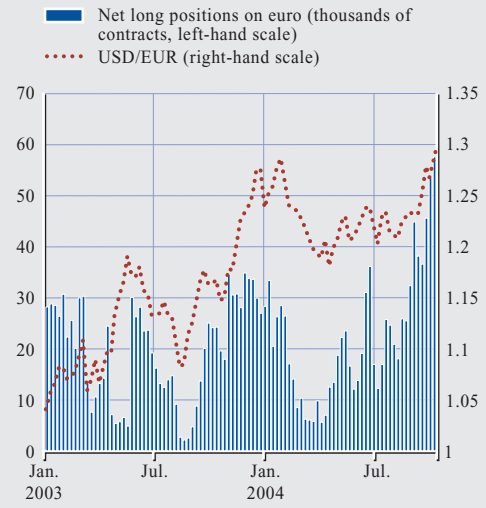
The counterpart of US dollar weakening was a strengthening of the euro and the currencies of other economies with flexible exchange rates. At the same time, the expected volatility for major currencies in foreign exchange markets implied in options prices declined almost continuously throughout 2004 (see Chart S8). Hence, market participants appeared to judge the likelihood of abnormally high or rapidly changing exchange rate volatility as remaining limited in the short-term.

Speculative positioning by market participants – including the direction of so-called carry trades – can shed some light on the direction in which market participants expect a currency to move.[7] The data collected by the US Commodity Futures Trading Commission (see Box 2) also provide a measure of speculative activity in foreign exchange markets.[8] The stabilisation of the US dollar in spring 2004 coincided with a reduction in net long euro positions, although these positions still remained high (see Chart 1.21). This suggests that a partial unwinding of short US dollar carry trades also took place. Net long positions favouring an appreciation of the euro increased again after late May, reaching a new all-time high in mid-November.

The currencies of the largest NMSs strengthened after EU accession in May. Fuelled by solid domestic demand, rising equity prices, strong capital inflows and widening short-term interest rate differentials, the Polish zloty, the Czech koruna and the Hungarian forint all appreciated against both the euro and the US dollar.

Chart 1.21 Speculative USD/EUR positions and USD/EUR exchange rate

(Jan. 2003 – Nov. 2004)



Sources: ECB and Bloomberg.

US EQUITY MARKETS

Consolidating the recovery that got underway after March 2003, US equity markets benefited from an improving economic outlook, low interest rates and lower risk premia – thanks in part to the strengthening of companies' balance sheets – through the remainder of the year. While the weight of investor flows in driving stock prices upwards was apparent in mutual funds flow data – mutual funds hold around one-quarter of US corporate equities – until early 2004, the importance of this factor tapered off in the course of 2004 (see Chart S10), and the market was essentially range-bound through much of 2004. Uncertainty about future stock market movements, which had been relatively high in 2002 and early 2003, quickly faded away, to some extent reflecting this lack of direction. By mid-November 2004, implied volatility had dropped to relatively low levels (see Box 3).

A further factor that may have underpinned the recovery of US stock markets after early 2003 was a rise in the funding of equity positions through borrowing. For instance, after September 2002

7 In foreign exchange markets the term "carry trade" refers to a trading strategy that aims at taking advantage of the interest rate differential between two currency areas. In these trades, investors usually fund themselves in the currency with the lower interest rate, sell this currency against a higher yielding one, and then invest the proceeds at the higher interest rate, thereby earning "carry". Such strategies are profitable, as long as the higher yielding currency does not depreciate against the lower yielding one.

8 These data have been shown to explain a large proportion of the variance in foreign exchange rates. See, for instance, Klitgaard and Weir (2004) op. cit, and Castrén, O. (2004), *"Do Financial Market Variables Show (Symmetric) Indicator Properties Relative to Exchange Rate Returns?"*, ECB Working Paper No 379.

member firms of the New York Stock Exchange increased their borrowing to buy stocks for their clients "on margin" – an arrangement that allows investors to use loans to pay for up to 50% of a stock's price (see Chart S14). This suggests that relatively cheap and abundant sources of liquidity may have encouraged investors to increase their exposures to equity markets. Although this yardstick of leverage in US equity markets appeared to stabilise in mid-2004 at levels well below the heights reached in early 2000, the vulnerability of share prices to adverse market dynamics arising from margin calls – a repayment demand triggered by sliding share prices – may have increased somewhat since early 2003.

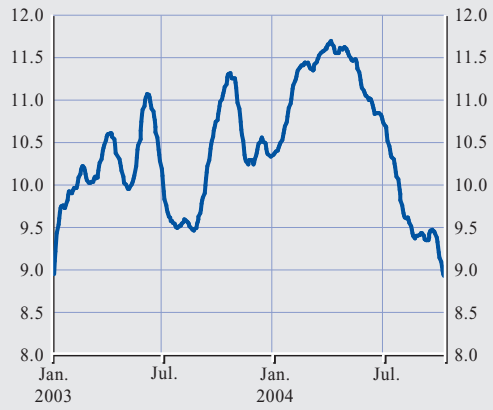
Box 3 Factors underlying recent declines in implied volatilities across financial markets

Notable declines in the volatilities implied in option prices to relatively low levels took place across a wide range of financial markets after spring 2004 (see Charts B.3.1 and 2). Implied volatility is often used to gauge the degree of uncertainty prevailing in markets, and can provide information on expectations of future financial market stability. Theoretically, implied volatility in bond and equity markets should tend to rise when a business cycle expansion moves into a mature phase, as uncertainty begins to increase about the necessity for monetary policy tightening. Moreover, the onset of rising interest rates typically leads to higher volatility as uncertainty about the future trajectory of interest rates increases. Foreign exchange volatility can be affected if business and interest rate cycles are desynchronised. The future market quiescence implied in the recent pricing of options has been remarkable, given indications of a maturing of the global economic upturn, coupled with rising interest rates, the surge in oil prices, persistently wide global imbalances and ongoing geopolitical uncertainties. This Box assesses some of the factors that appear to have played a role in driving implied volatility lower.

Three fundamental factors appear to explain the general decline in implied volatilities across different financial markets. First, recent patterns may have reflected the continuation of a period

Chart B3.1 One-month at-the-money EUR/USD implied volatility

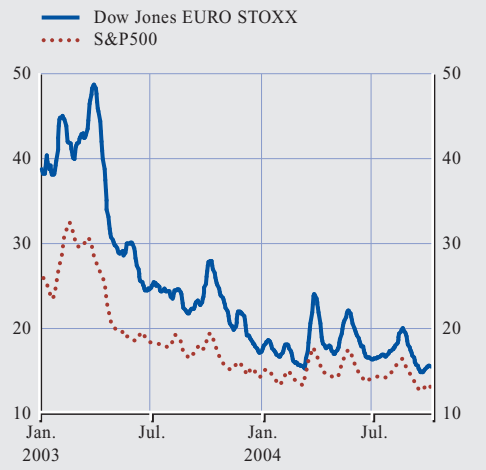
(20-day moving average, %)



Source: Bloomberg.

Chart B3.2 Implied volatility on the Dow Jones EURO STOXX and the S&P 500

(ten-day moving average, %)



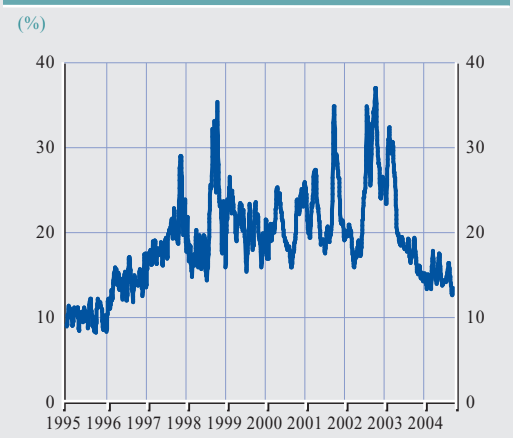
Source: Bloomberg.

of normalisation following several financial market shocks, beginning with the Asian and Russian crises of 1997/1998 and followed by the subsequent collapse of LTCM, the bursting of the IT stock market bubble, several corporate accounting scandals, growing international terrorism, the war in Iraq and fears of deflation (see Chart B3.3). Second, improving global macroeconomic conditions together with low inflation also appear to have played a role. Third, there appears to be a general perception among market participants that the communication of monetary policy intentions has improved globally, thereby reducing fears of monetary policy surprises.

Apart from fundamental factors, there may also be some technical aspects that lie behind the decline in implied volatility, particularly in equity markets. Substantial growth in the market for collateralised debt obligations (CDOs) – which are essentially debt security instruments that are backed by a diversified loan or bond portfolio – has opened up possibilities for hedging positions in corporate bonds and it appears to have played some role in the compression of spreads in the underlying markets. There is potential for interplay in the pricing of implied volatility and credit spreads that arises from arbitrage. Low implied equity market volatility should, all else being equal, be associated with tighter credit spreads so that credit spread compression and the decline of volatility could have served to reinforce one another as part of an arbitrage process via CDO markets. Although other factors may have played a role, one possible indication of greater hedging of CDO exposures through equity options markets has been a significant increase in the amount of equity options outstanding on organised exchanges. Open interest (i.e. the total number of option contracts that have not yet been exercised, expired, or fulfilled by delivery) in equity index options increased substantially during 2004. In the first three quarters of the year, it rose by almost 50% for the S&P 500 and by almost 40% for the Dow Jones EURO STOXX 50 compared with the same period in 2003 (see Charts S15 and S30). Hence, the decline in implied volatility may, to some extent, be a manifestation in another guise of the hunt for yield that characterised financial markets through much of 2003 and 2004.

From a financial stability viewpoint, the possibility that technical factors may have led to a mispricing of implied volatility in stock markets could have several implications. First, to the extent that it has underpinned a trend of rising leveraged credit investment, it may have left CDO markets vulnerable to shocks – including possibly unpredictable and disorderly market dynamics. Second, if it has contributed to the lowering of volatility in the underlying markets, it may have encouraged excessive risk-taking by financial institutions. For instance, it cannot be excluded that institutions that have set aside risk capital based on VaR approaches, which includes some euro area banks, may find that they have set aside insufficient amounts for seemingly low risk positions that could quickly become highly volatile in the event of an unexpected market disturbance. Third, if actual volatility were to rise suddenly, option sellers could face unexpected losses, especially if their risk management systems prove to be inadequate.

Chart B3.3 Implied volatility (VIX) on the S&P 500



Source: Bloomberg.

Commonly used valuation indicators such as price earnings ratios fell almost uninterruptedly after 2000 (see Chart S11). While the bursting of the stock market bubble between 2000 and 2003 brought valuations close to historical averages, it was the improvement in earnings that played the more important role in late 2003 and throughout 2004. By end-October 2004, complementary valuation indicators based on option prices did not suggest that concerns were present among market participants about the likelihood of either large stock price declines or increases (see Chart S12).

Against the background of improving conditions in US equity markets, it became easier for firms to tap the market for fresh equity, allowing them to improve debt-equity ratios (see Chart S16). In addition, activity in the initial public offerings (IPO) market started to revive in early 2004, increasing markedly as the year progressed.

US CORPORATE BOND MARKETS

Spreads on US corporate bonds narrowed significantly in 2003, remaining rather tight through the first eleven months of 2004 (see Chart 1.22). The compression of spreads was set in motion by substantial repair of balance sheets in the US corporate sector, together with an ongoing recovery of profits, a drop in default rates and a dissipation of uncertainties in equity markets. The combination of these factors allowed corporations to refinance debt and to lock in lower interest rates, underpinning the resurgence in profits.

Notwithstanding improvements in the fundamentals, it cannot be excluded that investors' hunt for yield in a low-yield environment, perhaps fuelled by relatively cheap and abundant liquidity, may have been an important factor in compressing spreads in the course of 2003 and in holding them at narrow levels through 2004. Indications that financial institutions were increasing their exposures to interest rate risk were evident in the Value at Risk (VaR) readings – a yardstick of the risk in an investment portfolio – of some US banks, which rose in 2003 and the first half of 2004.

Chart 1.22 US BBB corporate bond spreads

(Jul. 2000 – Nov. 2004, basis points)

Sources: Bloomberg.

From a financial stability viewpoint, inordinately low corporate bond spreads may be a cause for concern if discrimination in the pricing of risks has been insufficient, particularly for lower-grade corporate, or junk, bonds. Not only may it leave corporate bond markets vulnerable to adverse disturbances, but the longer it persists, the greater the likelihood of a misallocation of capital. However, spreads remained relatively unperturbed either by trends in long-term interest rates or by the upturn in US official interest rates.

COMMODITY MARKETS

By mid-November 2004, oil prices in euro terms had risen by 35% since mid-November and by around 60% when compared with levels prevailing in May 2003. In real US dollar terms, they had reached levels similar to those that preceded recessions in the early 1970s and 1990s, although they remained well below those seen in the early 1980s. Increased global demand – primarily led by the strength of Chinese and US demand after the second half of 2003 – was an important factor in driving oil prices upwards. As oil supply is relatively inelastic in the short

Chart 1.23 US crude oil inventories

(Jan. 1999 – Oct. 2004, millions of barrels)

Source: American Petroleum Institute.

Chart 1.24 Share of non-commercial futures contract positions in overall crude oil futures contract positions

(Jan. 2001 – Nov. 2004, %)

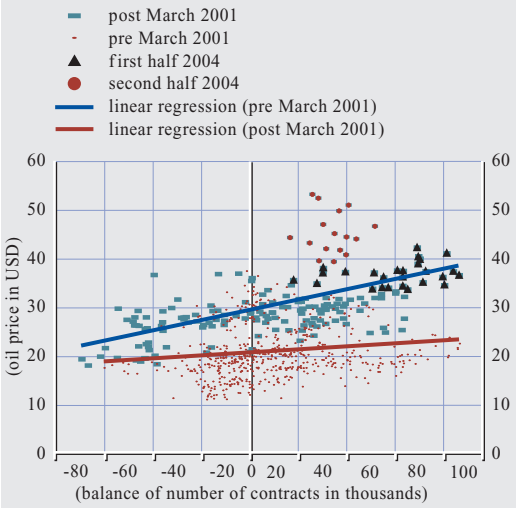
Sources: Commodity Futures Trading Commission (CFTC) and ECB Calculations.

run, oil inventories declined after June 2004 (see Chart 1.23). However, there also seems to be an investment deficit in the oil industry, both in exploration and in refining capacities. In addition, other factors that played a role in driving oil prices upwards included geopolitical tensions affecting oil supply from the Middle East, hurricanes originating in the Caribbean basin, as well as past tensions in Venezuela and Nigeria, and the ongoing tax dispute between the Russian government and the major oil producer Yukos, which accounts for a production capacity of 1.7 million barrels per day.

Speculative activity also appears to have played a role in driving oil prices higher, possibly beyond levels explainable by supply and demand alone. The share of speculative positions in oil futures markets grew more or less continuously after mid-2002 (see Chart 1.24). Such speculative activity can leave investors – including hedge funds and the proprietary trading desks of some investment banks – vulnerable to risks of sudden reversals. This means that whereas in the past the financial stability implications of oil price swings ran, for the most part, through indirect channels, the direct exposures of financial institutions rose somewhat in 2004.

There is no clear relationship between the level of oil prices and speculative positioning in oil futures markets (see Chart 1.25). It therefore seems unlikely that speculative activity could lead to misalignments in oil markets for protracted periods.

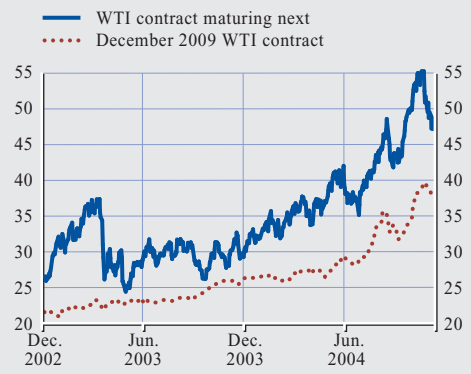
Chart 1.25 Oil prices and net long crude oil positions of non-commercial investors in futures markets



Sources: Commodity Futures Trading Commission (CFTC) and Bloomberg and ECB estimation.

Chart 1.26 Prices of the next-maturing WTI future contract and the future maturing in December 2009

(Dec. 2002 – Nov. 2004, USD)



Source: Bloomberg.
Note: WTI = West Texas Intermediate.

Chart 1.27 Precious metal prices

(Jan. 1998-Nov. 2004, index: Dec 1997=100)

Sources: Global Financial Data.

Independent of speculative activity, a significant rise in the oil prices implied in longer-dated futures contracts suggests that although market participants may be expecting some future decline, they also expect that the recent surge could prove to be lasting (see Chart 1.26).[9] Should higher oil prices have a more pronounced impact on economic growth than initially anticipated, indirect effects may entail negative consequences for financial institutions' profits.

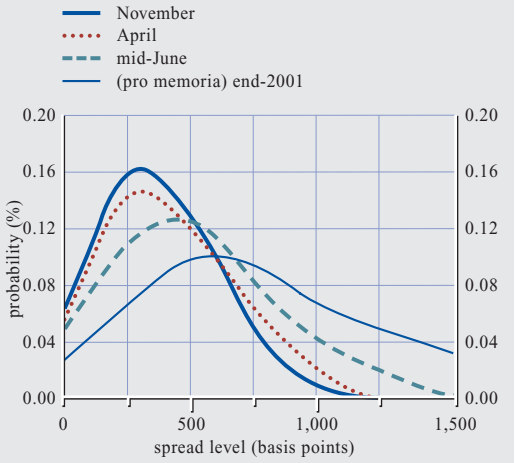
In US dollar terms, gold and other precious metals prices have surged over the past two years, driven, in part, by the weakening of the US dollar, geopolitical uncertainties, the low interest rate environment and de-hedging by gold producers. It cannot be excluded that, developments in gold markets – also mirrored in other precious metals markets such as platinum and silver – have, to some extent, reflected market concerns about the longer-term implications, including inflation, of apparently abundant liquidity in global capital markets (see Chart 1.27). Indeed, it was notable that the dissipation of geopolitical risks – which brought substantial drops in implied volatility in equity markets – did not halt the relentless climb in precious metals prices. A further factor that appears to have underpinned the upturn in precious metals prices is thought to be speculative activity in these markets undertaken by hedge funds.

EMERGING MARKET FINANCING CONDITIONS REMAINED BENIGN IN 2004

Notwithstanding some volatility in emerging market economy (EME) bond markets, financing conditions were broadly accommodative up to September 2004. The broadly based rally in secondary emerging bond markets, which began in the wake of the Brazilian presidential election in autumn 2002, was broadly extended in spring 2004. Whereas at end-December 2001, about one year prior to the start of the rally, the distribution of EME bond spreads over US Treasuries with comparable maturities was relatively wide and centred around 600 basis points, it shifted to the left and became narrower, centring around 300-400 basis points in early April 2004 (see Chart 1.28).

9 The future oil price in long-dated contracts always trades below the next-maturing ones. This is mainly due to technical factors and does not necessarily imply that market participants necessarily expect declining oil prices.

Chart 1.28 Frequency distribution of emerging market economy bond spreads in 2004



Sources: JP Morgan Chase & Co. and ECB calculations.
Note: Based on Epanechnikov kernel estimates. The estimates exclude Argentina.

Over and above traditional determinants, the compression of EME bond spreads up to early 2004 appeared to have been driven by ample liquidity conditions, as reflected in the historically low interest rates prevailing in mature economies.[10] In this environment, carry trades and a widespread hunt for yield favoured emerging market bonds. However, it may also have led to a lack of discrimination among international investors.

There was a significant widening of emerging market spreads in April and May 2004, as expectations of a tightening of US monetary policy became pronounced. However, the correction proved to be markedly different across borrowers, with bond spreads increasing most where they were high already or in economies that were considered financially vulnerable by market participants. Nonetheless, expectations of a more gradual monetary policy tightening path than previously anticipated, coupled with renewed carry trading and the continued improvement in EME fundamentals (notably in Brazil and Turkey), contributed to a subsequent narrowing of bond spreads. This effectively reversed the widening observed during April and May 2004. The (short-run) positive impact of higher oil prices in international markets for weaker, net oil exporting borrowers (such as Venezuela or Ecuador) also supported this trend.

The benign financing conditions facing emerging markets in 2004 as a whole translated into brisk international bond issuance activity both by private and public issuers, with only a temporary halt in May. Apart from enabling debt refinancing at relatively favourable rates, some EMEs continued to lock in low interest rates by anticipating scheduled obligations or by engaging in active debt management, as in 2003. In this context, partial data up to Q3 2004 suggest that total international issuances in 2004 will be comparable to the strong issuance seen in 2003, with Mexico and Korea leading the way in their respective regions (see Table S2).

All in all, looking ahead insofar as carry trades and the hunt for yield brought bond spreads back to historically low levels, concerns over potential mispricing and insufficient risk discrimination remain. As a result, unexpected deviations from the expected path of future interest rate increases in the US could trigger adjustment in EME bond markets, with financially vulnerable or sub-investment-grade borrowers especially at risk. Those EMEs with large external financing needs may remain particularly vulnerable to shifts in market sentiment.

Available evidence suggests that euro area investors' vulnerability to risks arising in the EME international bond market might be relatively limited. Indeed, according to the IMF's coordinated portfolio investment survey, in 2002 exposures of euro area residents to the Emerging Markets Bond Index Plus (EMBI+) countries accounted for about 5% of their reported portfolio investments in long-term debt securities outside the euro area. This

10 See IMF (2004), *"Determinants of the Rally in Emerging Market Debt – Liquidity and Fundamentals"*, Global Financial Stability Report, April, as well as Ferruci, G., V. Herzberg, F. Sousa and A. Taylor (2004), *"Understanding Capital Flows to Emerging Market Economies"*, Financial Stability Review, Bank of England, June.

notwithstanding, there is some evidence that euro area holdings of emerging market debt securities (including offshore centres) increased after 2002, with Asia's share increasing relative to Latin America, albeit from a low base.

1.3 CONDITIONS OF NON-EURO AREA FINANCIAL INSTITUTIONS

CONDITIONS IN NON-EURO AREA EU-15 BANKING SECTORS[11]

Developments in non-euro area EU-15 banks were broadly comparable with those of banking sectors in the euro area, although in general returns on equity (ROEs) were higher and they increased in 2003 by slightly more than in the euro area (see Section 4). Similar to the euro area, the average return on assets (ROA) increased over the same time period.

CONDITIONS IN THE BANKING SECTORS OF THE NMSs

Euro area banks own a significant share of the banking sectors in the NMSs and an increasing share of income in euro area banks is generated by their subsidiaries in the NMSs. In 2003, ROE in the NMSs banks overall improved only moderately, mostly due to the mixed performance of central and eastern European countries' banking sectors, although the opposite held true for banks in the Baltic states. Operating income grew at a slower pace than total assets, mainly due to narrowing interest rate margins. In the NMSs, in contrast to euro area banks, net interest income increased as a share of total income. However, cost control did not prove sufficient to improve cost efficiency.

Banks' asset quality improved in most of the NMSs as the overall ratio of non-performing and doubtful loans declined in 2003. The coverage of non-performing and other doubtful assets by provisions fell.

The overall solvency ratio slightly declined for the NMSs as a whole, with the most significant decrease taking place in banking sectors which had experienced the highest growth in assets or which had suffered losses for the 2003 fiscal year.

GLOBAL BANKS

Increasing financial market integration and consolidation among global financial intermediaries has meant that systemic events occurring in one part of the global financial system may be felt by institutions in other parts of the system. Geographic distance from potential systemic events no longer implies low risk of being impacted by them. Global financial groups are active, if not dominant, in most financial market segments including over-the-counter (OTC) derivatives and interbank, bond, equity and foreign exchange markets. This undoubtedly points towards increased interlinkages in the global financial system, and the potential importance of these institutions for global financial stability. For example, Moody's estimates that in 2003 approximately 40% of Citigroup's and 23% of JP Morgan's earnings came from outside the US.[12] Given the counterparty links between global financial institutions and euro area banks, this sub-section of the review briefly analyses developments among major global financial groups.[13]

Interim results and earnings releases for non-euro area global banks indicated the continued improvement in profitability of these institutions for the first half of 2004 (see Chart 1.29). Profitability was driven by reduced provisioning for loan losses and by cost control. Increases in non-interest income due to trading revenue also contributed to profitability. Margins which had been falling over the past few years are expected to recover following the upward movement in

11 Developments in the EU-15 and NMS banking sectors are discussed in detail in ECB (2004), *EU Banking Sector Stability Report.*

12 Moody's (2004), *"Citigroup Analysis"*, September.

13 There are several ways of defining global groups. For present purposes, institutions are included if they are among the top-ranking OTC dealers based on data provided by Swapsmonitor. The institutions included are Citigroup, JP Morgan Chase, Merrill Lynch, Goldman Sachs Group, Lehman Brothers and Morgan Stanley.

short-term rates in the US. Available regulatory capital adequacy ratios stood at slightly higher levels in 2003 relative to 2002. The Tier 1 ratio was 8.74% in 2003 versus 8.47% in 2002.[14]

The conjunctural situation for retail credit risk has been relatively positive for some of these institutions with large retail exposures. However, this may deteriorate if employment prospects diminish for the household sector (see Section 1.1).

A restrained macroeconomic environment meant that corporate mergers and acquisitions (M&A) activity – traditionally a source of substantial revenue for most of these institutions – has also been quite subdued in the past few years. In order to maintain profitability, banks have had to generate other sources of revenue, including the reallocation of capital to increased trading activities.

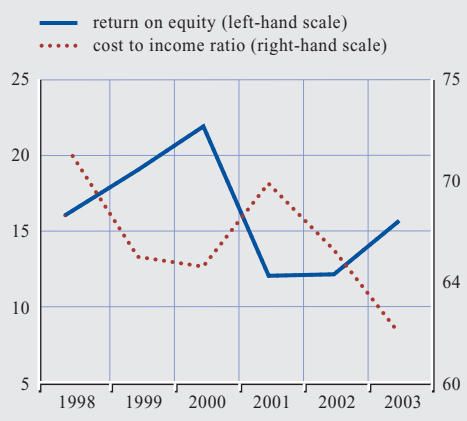
Global banks undertake trading in financial markets, both on their own account and for their clients, accounting for a substantial portion of some of these institutions' earnings (see Chart 1.30). Stock market turnover tends to be higher in rising financial markets, and these institutions accordingly recorded substantial profits from this activity in 2003. Nevertheless, this source of income is rather volatile, so that the gains may prove to be transient, particularly given low volatility across most financial market sub-segments in 2004. A decline in trading revenue from debt markets was reported by some large institutions in the first quarter of 2004. This caused losses for some groups. Some of these groups also face ongoing risks of litigation following the Enron and WorldCom scandals, despite having settled some of those actions.

There were some indications of increased market risk-taking by some global banks in 2004. One way of measuring possibly increased market risk is through the statistical measure of

14 Source: Moody's (2004), *"US Banking Sector Outlook"*, Special Comment, July. These figures refer to bank holding companies with assets greater than $34 billion. This figure includes institutions other than those mentioned in the previous footnote. Some of the institutions mentioned in the previous footnote do not calculate these ratios on a group-wide basis.

Chart 1.29 Performance indicators of major non-euro area financial institutions

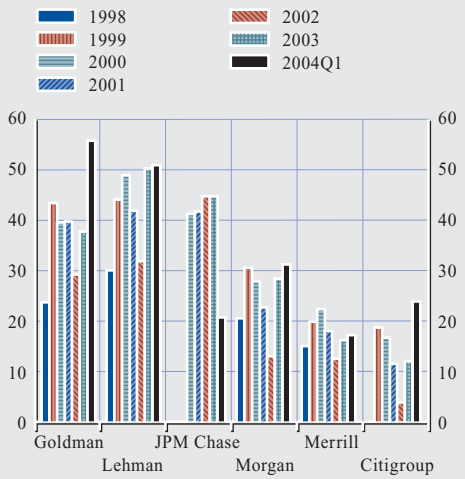
(1998 – 2003, %)



Sources: Bankscope and ECB calculations.

Chart 1.30 Principal trading revenues of global financial institutions

(1998 – Q1 2004, % of net revenues)



Sources: Securities and Exchange Commission (SEC) filings and quarterly earnings reports.

value at risk (VaR).[15] There are difficulties in comparing absolute VaR readings across several institutions, and in this respect, changes may be more informative.[16] The aggregate median increase of VaR across the institutions sampled was just under 25% from June 2003 to June 2004. However, the change in VaRs showed a great deal of dispersion across banks.

The most significant component of total VaR for these institutions is interest rate risk, followed by equities. Both recorded a median increase of about 30% for the period between June 2003 and June 2004, again with substantial variation across institutions. This change was comparable to the increases recorded by large euro area banks that publish VaR figures. The variation in VaRs could possibly indicate different trading strategies on behalf of banks and their clients. Notwithstanding this, the amount of potential losses calculated under this measure still remains a very small proportion of these institutions' own funds.

While the markets for which VaR is used as a measure of risk tend to be highly liquid under ordinary conditions, VaRs in general do not capture the risk that market positions may not be easily exited because of crowding of the same trades, or hedged within the reference holding period.

Overall, ratings and market indicators suggest that no immediate credit or market risks will threaten the stability of the global institutions considered. However, non-market risks will remain for some time with the possibility of continued Enron-related litigation for some of these institutions.

JAPANESE BANKS

Japan's share in the total claims of euro area banks increased somewhat between late 2003 and end-March 2004. By the latter date, Japan accounted for about 5% of the total foreign claims of euro area banks. There were significant differences between individual countries in their exposures to Japanese banks. Although direct links through the banking sector have remained small, financial market developments in Japan may be important for euro area financial stability owing to various indirect links related to trade, the exchange rate and securities markets. By late 2004, indications were that the balance sheets of most large Japanese banks had improved compared with the situation in 2002, supported by the upturn in the economy, the strengthening of equity prices and pressure by the Japanese regulatory authority. The four largest financial groups in Japan were all created by a series of mergers in 2001 and 2002 that were aimed at creating stronger institutions; since then, consolidation has continued.

The major banks managed a significant reduction in the ratio of disclosed non-performing loans to total loans, and increased the level of provisions against bad loans (see Chart S5). There are also signs that banks have been seeking new business opportunities, such as lending to small businesses. Their lending policies have also been gradually changing to balance profit and risk more effectively. Against this background, the credit ratings of Japan's top banks were upgraded in June 2004. This, the first upgrade since the early 1980s, acknowledged improved disposals of non-performing loans, sales of cross-shareholdings, and the improved operating environment. Further acknowledgement of the improved condition of Japanese banks was seen in the decision by the Bank of Japan in September 2004 to end the policy it had put in place two years before of purchasing shares of non-financial corporates from banks.

15 VaR is a statistical estimation of the potential losses that could occur on market positions as a result of movements in market rates and prices over a specific time horizon and at a given confidence level.

16 The sample is based on large banks that are active in several OTC market segments and that disclose their VaR data regularly, namely JP Morgan Chase, Goldman Sachs Group, Citigroup, Bear Stearns, and Merrill Lynch, while the European institutions referred to are BNP Paribas, Deutsche Bank, Commerzbank, HVB, Barclays and Dresdner. The VaRs are calculated using different methodologies and assumptions across institutions, and therefore only limited inferences can be drawn from the percentage changes in the VaR amounts.

Notwithstanding the strengthening of balance sheets, the core operating profits of Japanese banks have remained weak and progress among large banks has been uneven. Banks also remain vulnerable to bond and equity market risk. While credit quality has improved, problem loans still remain high by international standards, a situation that still has the potential to cause further problems.[17]

17 For example, one large Japanese bank effectively failed in 2003 on account of high credit-related losses.

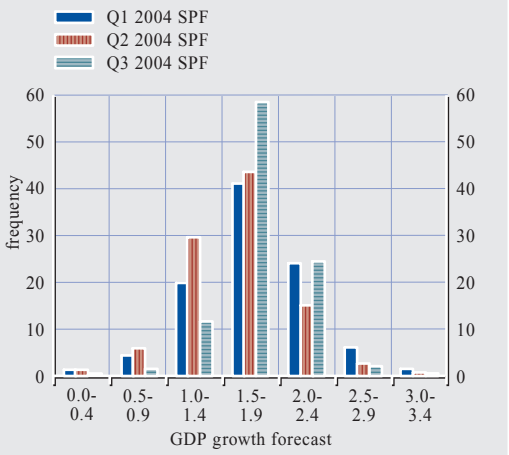
2 THE EURO AREA ENVIRONMENT

2.1 ECONOMIC OUTLOOK AND RISKS

After the slowdown in the pace of euro area economic activity that took place between mid-2000 and early 2003, the recovery started in 2003. The recent recovery gathered pace in the first half of 2004 but remained primarily driven by the strength of world demand. While economic growth weakened in the third quarter of 2004, by late 2004 the basic determinants of economic activity remained consistent with continuing economic growth in 2005.

The euro area growth outlook was surrounded by uncertainty in late 2004 (see Chart 2.1). By mid-November risks stemmed in particular from developments in oil markets. Rising oil prices raise firms' production costs and tend to reduce households' and firms' real income insofar as these are unable to incorporate higher oil prices into their wage and price-setting behaviour. Hence, high oil prices pose risks to domestic demand growth (see Box 4). Higher oil prices might furthermore negatively impact upon world demand and hence euro area exports. Over the medium term, a further remaining downside risk is the possibility that the strength of house prices in some countries could unwind quickly. This might have negative repercussions on domestic demand. On the external side, further

Chart 2.1 Frequency distribution of expectations for euro area GDP in 2004



Source: ECB Survey of Professional Forecasters (SPF).

Box 4 Macro-financial risks associated with rising oil prices

Starting from around USD 20 per barrel in early 2002, oil prices had surged to a record high around USD 50 per barrel in October 2004 before declining somewhat in November. For households, rising oil prices can adversely impact real disposable income for discretionary spending. This may impair the ability of highly indebted households to service their debts. For non-financial corporations – particularly those with high levels of energy consumption – rising oil prices can adversely impact on profit margins. In turn, as cash flows deteriorate, the ability of corporations to service their debts may be hampered. Whether or not recent oil market developments pose financial stability risks for the euro area ultimately depends on whether oil prices remain persistently elevated, and on the degree to which the balance sheets of households and firms are affected.

Looking ahead, according to futures prices, market participants had by November expected oil prices to remain high for the remainder of 2004, only declining gradually thereafter (see Chart B4.1). However, these expectations are surrounded by a high degree of uncertainty. While global demand may remain high, it has been proven in the past that persistently high oil prices can bring new oil production on stream that may previously have been unprofitable, possibly alleviating concerns about long term supply.

Uncertainty about oil price developments can have adverse consequences for economic activity by clouding the economic outlook. Risk-averse consumers may hold off on major purchases, while

firms may postpone investment projects or stretch out those projects that cannot be put on hold. If consumers and firms perceive the spike in oil prices to be transient, they may not fully reduce their expenditures in line with their decline in real disposable income, but instead pursue a strategy of expenditure smoothing. Should the rise be perceived as being likely to prove more long-lasting, the impact on economic activity would undoubtedly be more severe.

Three factors contribute to the assessment that the impact of the recent rise in oil prices on euro area growth may be more limited than the impact of large oil price increases in the past. First, the lower oil intensity of economic activity in the euro area than in the 1970s, for instance, implies that the impact on household and corporate balance sheets should be less severe. Second, the wider availability of hedging instruments in financial markets and their increasing use by corporations enables the latter to shelter their earnings from unexpected oil price swings. Third, unlike in earlier oil price surges, the strength of global demand appears to have been an important contributing factor apart from supply-side concerns.

Assessing the impact of a sizeable increase in oil prices on the economy carries a significant degree of uncertainty. While estimates of the magnitude of the impact can be derived from macroeconomic models, such models are typically unable to adequately address all aspects. First of all, model predictions are usually based on typical historical experience, where, for the most part, oil price fluctuations tend to be moderate. This makes it difficult to capture adequately the adverse effects of less frequent oil price spikes on the economy. Moreover, as the estimates reflect the average experience over the sample period used to estimate the model, the impact of structural changes in the economy may not be sufficiently taken into account, such as declines in oil intensity over time. In addition, the literature generally finds that the absolute impact of oil price changes on economic activity tends to be asymmetric: oil price increases tend to have stronger impacts on economic activity than oil price declines of the same magnitude. This means that symmetric model specifications are likely to underestimate the negative impact of oil price rises on the economy. For example, a certain level of oil prices might render investment projects unviable, a threshold effect that most models are unable to capture. Finally, models usually concentrate on demand side effects stemming from lower disposable income. Supply side effects would most likely, via higher input costs, increase the estimated impact of oil prices on economic activity.

Chart B4.1 Oil prices and futures

(Brent crude)

Source: Bloomberg.

All in all, the recent rise in oil prices is expected to have a rather limited impact on euro area growth, especially when compared with the large oil price shocks of the past. Financial stability risks – which mostly arise through indirect channels – do not therefore appear to be material. Nevertheless, given the degree of uncertainty about likely future developments in oil prices and in particular about their probable effects, this assessment is clouded by a considerable degree of uncertainty.

downside risks to euro area growth relate to the persistence of wide global imbalances.

2.2 BALANCE SHEET CONDITIONS OF NON-FINANCIAL SECTORS

NON-FINANCIAL CORPORATIONS

After the sizeable build-up of corporate sector debt in the euro area between 1998 and 2001, a process of balance sheet restructuring got underway. Corporations were encouraged by market discipline – including rising spreads on corporate bonds, a preponderance of credit downgrades and heightened equity market volatility – as well as a tightening of bank lending standards to strengthen their balance sheets. Even though the financing conditions facing firms subsequently began to improve, corporate sector indebtedness hardly changed after the first quarter of 2002 (see Chart S19).

The levelling off of corporate sector indebtedness was also partly explained by weaker demand for loans and by subdued corporate bond issuance. To some extent, this seemed to reflect a more cautious attitude on the part of firms to invest in risky projects against the background of a relatively hesitant economic recovery.

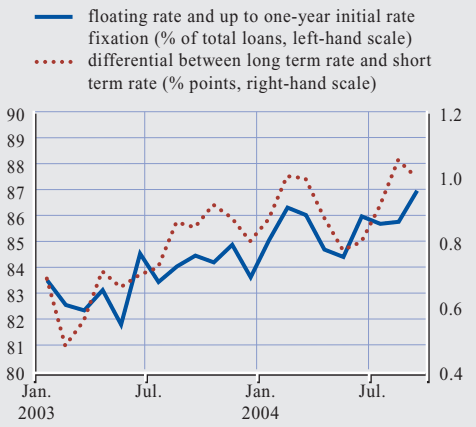
There were some indications that firms had been taking advantage of relatively low long-term interest rates by lengthening the maturity of their debts (see Chart S20). However, it is not clear whether this has left them less vulnerable to the possibility of rising short-term interest rates. This is because some larger firms are thought to have employed the interest rate swaps markets in order to convert long-term liabilities into floating rate obligations.

Notably, the proportion of new bank loans extended to corporations at variable interest rates rose after early 2003, apparently driven by low short-term interest rates and the progressive steepening of market yield curves (see Chart 2.2).

After late 2002, the profits of euro area corporations picked up. At first, this was driven mainly by cost-cutting – including labour shedding, lighter debt servicing costs and the postponing of investment (see Chart 2.3). It was not until the final quarter of 2003 that larger corporations in the euro area began to see a

Chart 2.2 Short-term loans to euro area non-financial corporations and yield curve slope

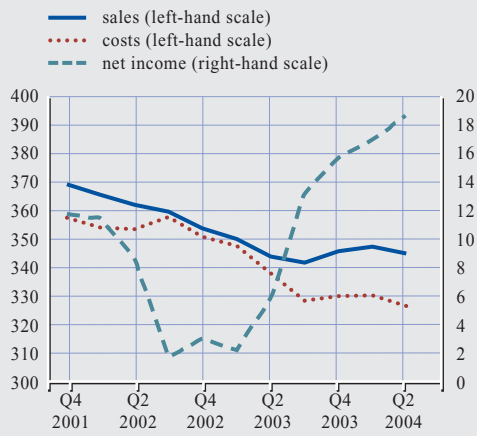
(Jan. 2003 – Sep. 2004)



Sources: ECB MFI interest rate statistics.
Note: Short-term includes loans extended at floating rates and with up to one year initial period of fixation.

Chart 2.3 Costs, sales and profits of Dow Jones EURO STOXX 50 companies

(Q4 2001 – Q2 2004, four-quarter moving average, EUR billions)



Source: Bloomberg.
Note: Data cover 33 companies accounting for 70% of stock market capitalisation.

turnaround in revenues, supported by a stronger than expected global economic environment.

With improved cost efficiency underpinning a widening of operating margins, year-on-year growth in the earnings per share (EPS) of euro area firms became substantial after early 2004 (see Chart S23). Reaching levels not seen since the mid-1990s, this helped to ease balance sheet strains by improving the availability of internal funds, thereby curtailing the need for firms to raise funds externally. This, together with asset sales by firms in some instances, improved liquidity positions, indicated by relatively high levels of corporate deposits with banks (see Chart S21).

The slowdown in the growth of corporate debt by euro area corporations produced a decline in the ratio of total debt over total financial assets from early 2003 onwards (see Chart S22). Hence, on aggregate, firms could comfortably repay debts by liquidating financial assets if needed.

Declining interest rates through the 1990s seemed to ease the repayment burdens of firms in the euro area. Looking ahead, should interest rates rise, the impact on repayment burdens will depend on the distribution of corporate sector debt across the maturity spectrum. While recent indications of an increasing dependence on floating rate debt financing leaves firms vulnerable to changes in short-term interest rates, there is little to suggest that this could prove unmanageable, at least at an aggregate level.

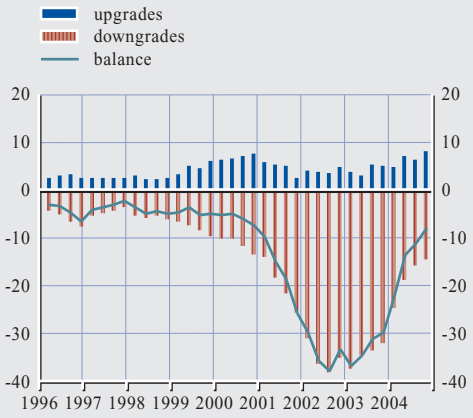
CORPORATE SECTOR RISKS

Perhaps reflecting expectations of a consolidation of profitability and of further balance sheet strengthening by large euro area firms in the period ahead – particularly by those issuers that faced market discipline through rating downgrades – upgrade-downgrade ratios improved continuously after late 2002 (see Chart 2.4).

There are still some remaining indications that the outlook for smaller and medium

Chart 2.4 European non-financial corporate sector downgrades, upgrades and balance

(Q4 1995 – Q3 2004, four-quarter moving average, number)



Sources: Moody's.

sized enterprises could prove to be more challenging than the environment facing larger firms. For instance, the number of insolvencies of firms in the euro area rose in 2003 and is expected to climb slightly further in 2004, primarily reflecting the negative outlook for smaller firms. Hence, banks may be faced with some further corporate loan losses in the period ahead. Empirical analysis conducted by Euler Hermes suggests that a growth rate in the region of 2-3% may be required to stabilise the incidence of bankruptcies in the euro area (see Chart 2.5).[1] There are some indications that firms at the lower end of the credit quality spectrum have been finding it easier to raise funds in capital markets (see Box 5). This may have introduced new vulnerabilities for the next cycle.

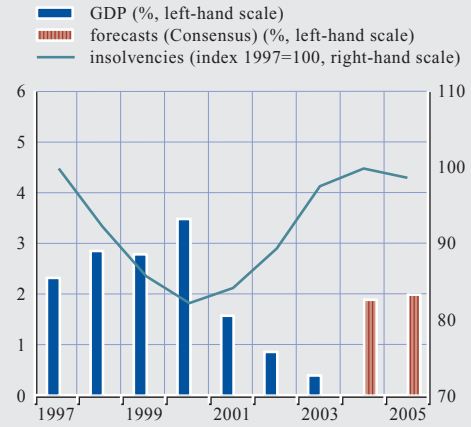
MARKET INDICATORS OF CORPORATE SECTOR FRAGILITY

Distributions of expected default frequencies (EDFs) – a market-based measure of the

1 See Euler Hermes (2004), *"Insolvency Outlook: Business Insolvency in Industrial Countries"*, June.

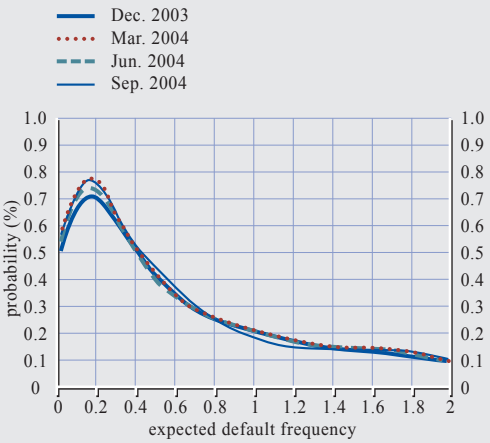
Chart 2.5 Annual GDP growth and corporate insolvencies in the euro area

(1997 – 2005)



Sources: ECB, Euler Hermes and Consensus Economics

Chart 2.6 Euro area non-financial corporations' expected default frequency distributions



Sources: Moody's KMV and ECB calculations.
Note: The expected default frequency provides an estimate of the probability of default over the following year.

probability of corporate default over a 12-month horizon – for euro area corporations became more compressed after late 2003 (see Chart 2.6). Hence, market participants acknowledged that efforts had been or would be made to strengthen the balance sheets. Nevertheless, between June 2004 and September, there was some deterioration. This may have been linked to concerns about the balance sheet implications for firms of the surge in oil prices throughout 2004.

Underlying the aggregate data for the corporate sector, there are some signs that the improvement in the financial positions of euro area corporations after September 2003 was uneven. In particular, large firms tended

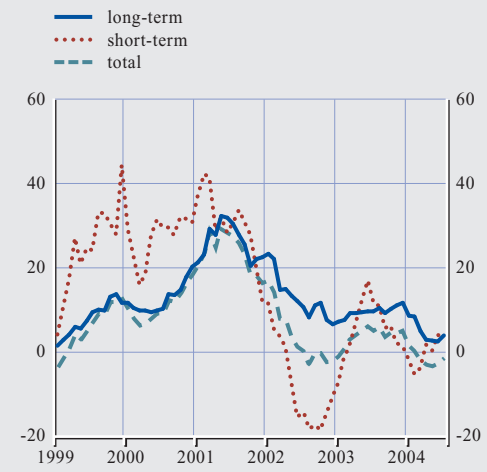
Box 5 Hunt for yield and corporate bond issuance

Issuance of bonds by euro area corporations tapered off, on aggregate, after mid-2001 (see Chart B5.1). This pattern was common across the credit quality spectrum (see Chart B5.2). Notably, even after late 2002, when corporate bond spreads began to respond to the efforts made by corporations to repair their balance sheets, issuance activity only picked up mildly. However, differences in the issuing patterns of firms with high and low credit ratings became apparent after mid-2003. In particular, while the issuance activity of firms with investment-grade ratings increased somewhat, signs began to emerge that the issuance of bonds by firms with sub-investment-grade ratings – debt securities that are sometimes termed "junk bonds" – was increasing significantly. Issuance of these bonds in the second quarter of 2004 surpassed the levels that were seen at the zenith of the boom in euro area corporate bond markets in 2000.

The fact that issuers with low and sub-investment-grade ratings have been accumulating additional debt does not necessarily raise financial stability concerns. Default rates in this corporate bond market sub-segment declined significantly after mid-2003 (see Chart B5.3). Indications of easier access to finance by sub-investment-grade issuers may simply reflect a broadening of euro

Chart B5.1 Annual growth in debt securities issued by euro area non-financial corporations

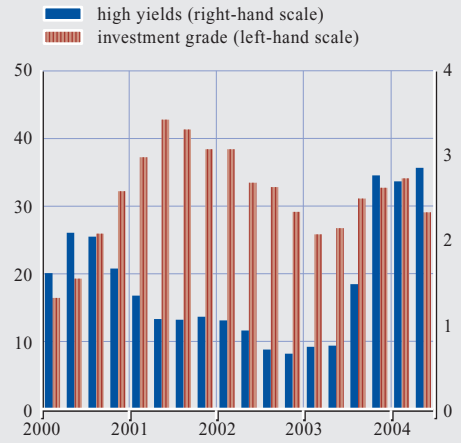
(% change)



Source: ECB.

Chart B5.2 Euro area bond issuance by non-financial corporatings by ratings

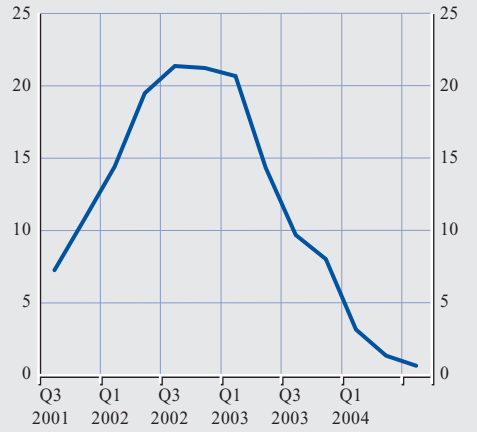
(EUR billions, four-quarter moving average)



Source: Thomsom Financial Deals.
Note: Investment grade covers the ratings between AAA and BBB-. High yield refers to sub-investment grade ratings.

Chart B5.3 Western European speculative-grade default rates

(12-month moving average)



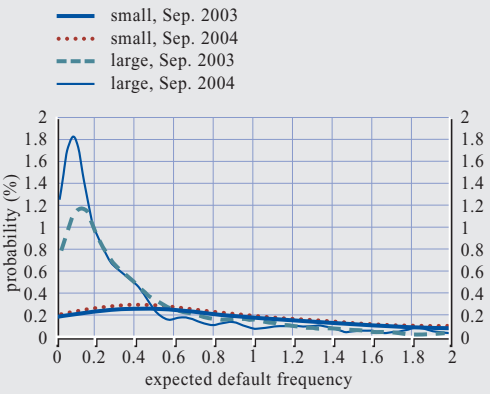
Source: Moody's.
Note: Data are issuer weighted.

area capital markets, facilitating the financing of high risk but potentially highly profitable projects that might not otherwise have been undertaken. It might also reflect that firms which found it more difficult to restructure their balance sheets on account of inadequate profits and cash flow continued to have greater financing needs. However, the fact that this issuance activity took place at a time when high yield corporate bond spreads have been unusually narrow and when issuance by higher quality issuers was subdued raises questions about the extent to which a "hunt for yield" among investors may have made investors less discriminating. To the extent that this has been the case and has raised the leverage of issuers that were already heavily indebted, this may have sown the seeds of balance sheet vulnerabilities for the next cycle.

to fare better than small ones with expected default frequencies for large firms showing a significantly more pronounced improvement (see Chart 2.7). To some extent this appears to reflect the differences in the operating environments of the two groupings with larger firms tending to benefit from the strength of external demand and smaller firms faced with anaemic domestic demand. This means that banks with large portfolios of loans to small

Chart 2.7 Expected default frequency distributions for large and small euro area firms

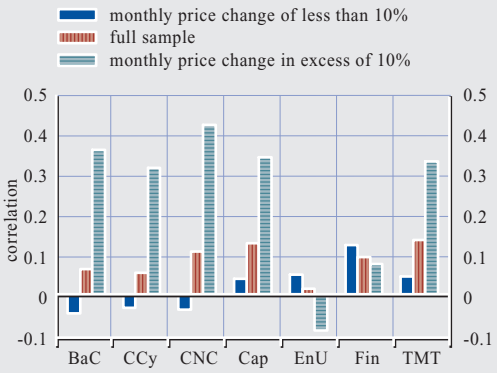
(Sep. 2004)



Sources: Moody's KMV and ECB calculations.
Note: The expected default frequency provides an estimate of the probability of default over the following year. Size is determined by the quartiles of the value of liabilities: small if less than 15 and large if greater than 293 million euro.

Chart 2.8 Correlation of monthly expected default frequencies and oil price changes

(Jan. 1992 – Jun. 2004, EUR)



Sources: Moody's KMV, Datastream and ECB calculations.
Note: Sectors are defined as follows: basic goods and construction (BaC), energy utilities (EnU), capital goods (Cap), consumer cyclical (CCy) and non-cyclical (CNC), financial (Fin) and technology, media and telecommunications (TMT).

firms may see little improvement in credit risk.

The surge of oil prices throughout 2004 may test the robustness of non-financial corporations' balance sheets. For those firms with high levels of energy consumption, rising oil prices can adversely impact on profit margins. In turn, as cash flows deteriorate, the ability of corporations to service their debts may be hampered. Correlations between monthly changes in median EDFs and monthly oil price changes show that when oil price changes are relatively small, there is little evidence that they have any bearing on market participants' assessments of the likelihood of default in any sector (see Chart 2.8). However, when oil price movements are large, a clear positive relationship emerges for most sub-sectors, with only the energy sector showing improvement. This suggests that concerns about the ability of corporations to repay their debts rise when oil prices rise sharply.

HOUSEHOLD SECTOR BALANCE SHEETS

Households in the euro area appear to face risks on both sides of their balance sheets. Relatively high house prices in some countries together with relatively high levels of indebtedness leave them vulnerable to the prospect of rising interest rates. This is because higher interest rates would raise debt servicing burdens in those countries where mortgages are contracted primarily at floating rates, and could take the steam out of property markets. Nevertheless, at an aggregate level, it does not appear likely that the strength of household balance sheets would be tested in the case of small changes in interest rates and house prices. This is mainly because households do not bear the bulk of interest rate risks in mortgages because of the preponderance of fixed or quasi-fixed-rate mortgages in several euro area countries, coupled with the fact that household financial assets have also increased, keeping debt-to-financial asset ratios at comfortable levels. This notwithstanding, significant differences in household exposure to plausible changes in interest rates and house prices exist across the euro area.

Looking first at household sector debt, reflecting strong lending growth, euro area household indebtedness increased more or less continuously after 1999. By Q3 2004, the euro area household debt-to-GDP ratio was estimated

at 54.5%, although this remains still relatively low by international standards. Annual growth rates of loans for house purchase rose to 9.9% in September 2004. The continued strength of housing loan growth reflected low mortgage lending rates and, in some Member States, a relaxing of credit standards[2] as well as strong housing market dynamics in several euro area countries (see Chart 2.9).[3] The October 2004 ECB Bank Lending Survey provided indications of easier credit standards for the approval of loans for house purchase. Even though it showed a decrease in net demand for these loans, overall demand remained positive.[4]

Differences in household indebtedness across euro area countries are considerable (see Chart S24). This diversity is explained not only by local housing market developments, but also by differences in the fiscal treatment of mortgages[5] and in economic performances.

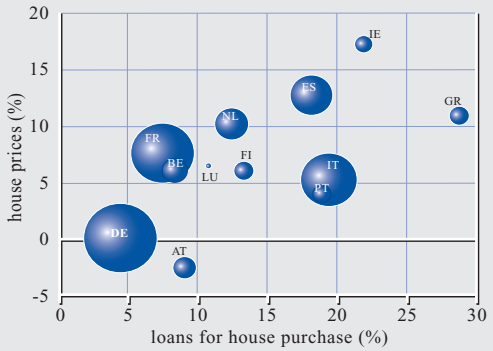
Turning to household assets, after the mid-1990s, the composition of their financial assets changed (see Chart 2.10). Insurance products gained in importance, while the proportion of shares declined. At the same time, there was an increase in the proportion of liquid instruments – such as deposits and currency – on the balance sheet of households.

In order to better understand changes in the risk profile of household's portfolios, an approximate calculation can be undertaken based on financial account data to account for households indirect holdings of equity and other assets through their investments in mutual and pension funds. Once this is accounted for, about one third of euro area household financial assets are potentially exposed to equity market developments.[6]

2 Notably, loan to value (LTV) ratios in mortgage lending have been rising in several countries.
3 See the Special Feature in this Review: *"Aggregate Household Indebtedness in the EU: Financial Stability Implications"*.
4 See ECB (2004), *"The Euro Area Bank Lending Survey"*, October.
5 Van Den Noord, P. (2003), *"Tax Incentives and House Price Volatility in the Euro Area: Theory and Evidence"*, OECD Working Paper, No 356. Neuteboom, P. (2002), *"Een Internationale Vergelijking van de Kosten en Risico's van Hypotheken (An International Comparison of Costs and Risks of Mortgages)"*, OTB Research Institute. Farinha, L. (2003), *"The effect of demographic and socioeconomic factors on households' indebtedness"*, Economic Bulletin, Banco de Portugal.
6 See Sanchis, A. and L. A. Maza (2003), *"Developments in the Spanish Household's Portfolios"*, Boletín Económico del Banco de España. This compares with more than 50% in the US. Debt securities accounted for around 32% in the euro area compared with 29% in the US, while liquid assets totalled around 40% of household assets in the euro area, compared with 16% in the US.

Chart 2.9 Euro area housing market dynamics and loans

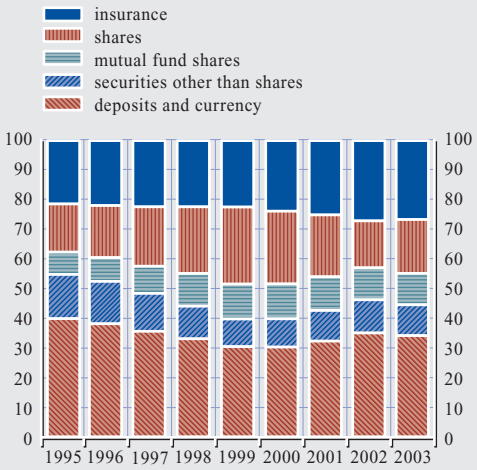
(1998 – 2003, average percentages per annum)



Source: ECB calculations based on national data.
Note: Circles are proportional to the size of real GDP.

Chart 2.10 Composition of financial assets of euro area household sector

(1995 – 2003, % of total financial assets)



Sources: ECB.

According to IMF estimates,[7] the proportion of non-financial assets in total household assets in Europe has remained broadly unchanged over recent years, at around half of the total.[8] This compares with around one-third in the US. In some countries, however, the share has increased, mainly because of rising house prices (see Chart 2.11). In addition, there are also wide cross-country differences, ranging from around 40% in the Netherlands to around 70% in Spain.

While data for the euro area as a whole are not available, there are indications that household wealth in the euro area has increased with rising property prices. Housing assets have also become more liquid in some euro area countries as financial innovation and the lifting of liquidity constraints have made it easier for households to borrow against housing wealth by taking out home equity loans.

Overall, euro area household assets seem to be mainly exposed to house prices as well as to equity prices. Nevertheless, the composition of household financial assets differs significantly across euro area countries.

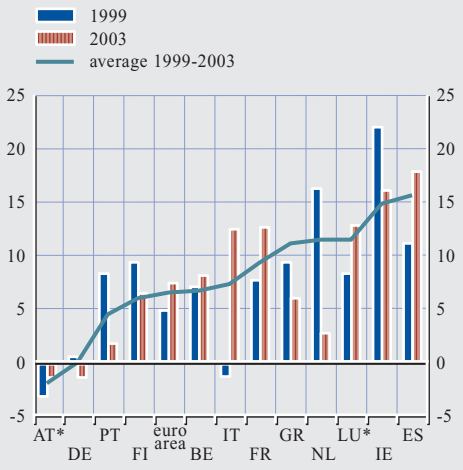
As for household net worth, changes will result from the accumulation of net savings (gross saving plus net capital transfers minus fixed capital depreciation) and from revaluation effects operating on assets and liabilities. After 2000, there was an increase in the euro area gross savings ratio of households which reached 14.5% in 2002, whereas net saving stabilised at around 9.25%. These developments were underpinned by the economic slowdown and deteriorating conditions in the labour market, both of which seemed to foster precautionary saving.[9] As a result, the ability of households to finance other sectors[10] continued to recover in 2002, reaching a level of 5.4% as a percentage of disposable income, although it remained below 1995 levels.

DEBT SERVICING CAPACITY OF HOUSEHOLDS

Although household indebtedness scaled new heights in the third quarter of 2004, the estimated ratio of total debt service burden (interest payments plus repayments of principal) to disposable income broadly stabilised after mid-2000. The decline in the interest payment burden of the household sector over this period appears to have partly offset the increase of the estimated repayment burden, driven by the rise of debt to disposable income (see Chart 2.12).[11] The portion of saving that is not earmarked for debt servicing, which functions as an indicator of the savings buffer to withstand significant interest rate rises, has also remained at comfortable levels over recent years. Also, the rise in the household debt-to-financial assets ratio, an indicator of households' ability to repay

Chart 2.11 Residential property price changes in the euro area and across euro area countries

(1999 – 2003; annual % changes)

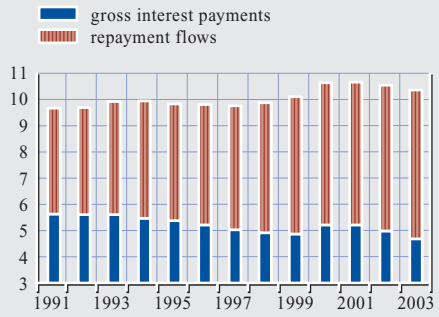


Sources: National sources and ECB calculations.
Note: *2002 values.

7 See IMF (2004), *Global Financial Stability Report*, September.
8 Although no official data are available for the euro area, it seems that the pattern is similar. See The Nederlandsche Bank (2003), *"Financial Behaviour of Dutch Households"*, Quarterly Bulletin, September.
9 The behaviour of the net saving ratio can be explained by the net variation of financial instruments plus the net change in non-financial assets.
10 This is net lending minus net borrowing.
11 Repayment flows are estimates based on an assumption of a constant maturity structure of the loans at euro area level. Though recent developments in mortgage lending might have entailed an increase in the duration of mortgage loans in some countries, there is no clear evidence of a significant change in euro area aggregated terms.

Chart 2.12 Total debt servicing burden of the euro area household sector as a ratio of disposable income

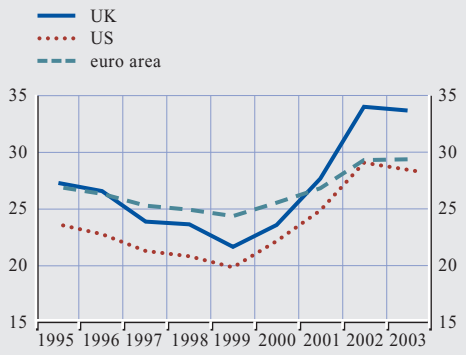
(1991 – 2003; %)



Sources: ECB calculations and estimates.

Chart 2.13 Household debt/financial assets ratio

(1995 – 2003, %)



Sources: ECB and OECD.

debt in the short term, was more muted than the rise in the debt-to-income ratio (see Chart 2.13). Overall, there has been little indication of households facing challenges in servicing their debts at prevailing interest rates.

HOUSEHOLD SECTOR RISKS: HOUSE PRICES

The sustainability of house prices in some Member States has been questioned by several observers, given that they reached historically high levels in 2003. In particular, house prices increased more rapidly than disposable income after 1999 (see Chart 2.14). To some extent, the strength of house prices is explained by the fact that the financing conditions facing households in mortgage markets were generally favourable over this period (see Special Feature on aggregate EU household indebtedness). Furthermore, it cannot be excluded that the poor performance of stock markets from 2000 through to early 2003 may have led investors to view investment in housing as providing a safer return.[12]

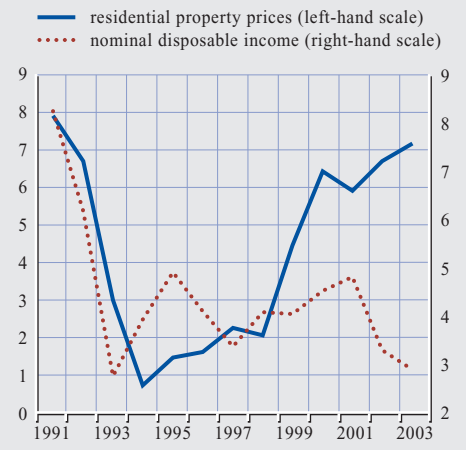
On the supply side, subdued residential investment since the mid-1990s in the euro area may also have contributed to strong house price increases. Among those countries that experienced relatively high average house price increases, only Spain and Ireland registered a generally robust increase in residential investment. Housing supply was particularly inert in the Netherlands, Italy and France.

Data shortcomings prevent the implementation of sophisticated methods to value aggregate house prices in the euro area. However, one yardstick is the ratio of house prices to

12 In fact, in the last two decades house prices have been buoyant, but their volatility has declined markedly.

Chart 2.14 Residential property prices and nominal household disposable income in the euro area

(1991 – 2003, % change)



Sources: National sources and ECB calculations.

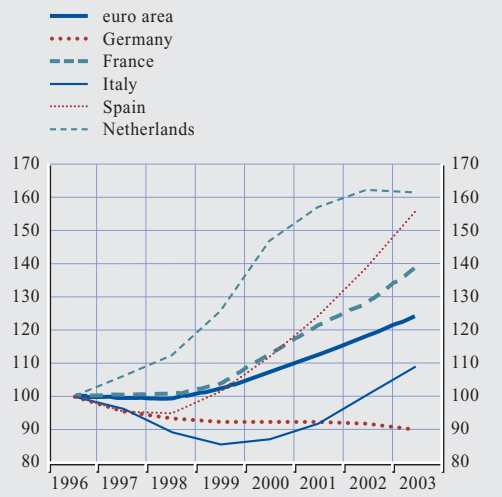
rents.[13] A prolonged divergence between rents and house price developments could be symptomatic of a developing overvaluation, unless there is a well-founded expectation that future rental income will be high. Applying such an indicator to euro area housing markets also carries some qualifications. First, since housing is essentially a non-tradable good, the concept of fair value may be difficult to apply to the euro area as a whole. Second, since the quality of house price data is often low and frequently not harmonised across countries, there are difficulties in distinguishing between quality improvements and genuine house price inflation.[14] Third, the choice of the base period for comparison may have an important bearing on the interpretation.

Notwithstanding caveats to the data, currently available evidence indicates that the house price-to-rent ratio has increased substantially since the second half of the 1990s in the Netherlands, Spain and France and, more recently, in Italy as well (Chart 2.15). However, in 2003, there was a levelling off of this ratio in the Netherlands. With regard to Spain, some research suggests that house prices in this country appear to be overvalued, with estimates ranging between 8% and 20%.[15] Such signs of overvaluation do not however necessarily imply the risk of strong corrections of house prices in the short run, and adjustment can also take place through rising rents. Unlike other asset markets, housing markets tend to adjust slowly, partly due to high transaction costs.

Since housing is the main asset, and mortgage debt the main liability held by households in euro area countries, a large house price correction might have important implications for private consumption and economic activity. There is a lack of widespread agreement on the significance of the housing wealth effect in the euro area, as houses, unlike bonds or equities, are also "consumed". Hence, for a given housing stock, when house prices rise, the resulting capital gain to the homeowner is partly, if not fully, offset by the higher discounted value of future rents.[16] The net effect will also depend on the extent to which private sector rents move in line with house prices, and on the differences in the financial position and the marginal propensity to consume of the different categories of households (such as owner-occupied, renters and investors) (see Table 2.1). In countries where home ownership is not high, a house price decline could benefit households through lower rents. At the same time, where home ownership rates are very high, the risk of adverse property market dynamics is likely to be mitigated, given the low likelihood that homeowners would shift to the rental sector to avoid an adverse property price movement, not least due to the typically high transaction costs involved.

Chart 2.15 House price-to-rent ratios for the euro area

(1996 – 2003, index 1996=100)



Sources: National sources and ECB calculations.

13 As the simplest implementation of the asset pricing approach, this ratio is analogous to the price-earnings ratio commonly used to judge stock price valuations.

14 See also McCarthy, J. and R. Peach (2004), *"Are Home Prices the Next Bubble?"*, FRBNY Economic Policy Review.

15 See Ayuso, J., J. Martinez, L. A. Maza and F. Restoy (2003), *"House Prices in Spain"*, Economic Bulletin, Banco de España, October.

16 See Muellbauer, J. and R. Lattimore (1995), *"The Consumption Function: A Theoretical and Empirical Overview"*, in Handbook of Applied Econometrics, Macroeconomics, M. H. Pesaran and M. Wickens (eds), Blackwell.

Table 2.1 Owner-occupied dwelling stock

(% of total stock)	1980	1990	2003
Germany	41	39	44
France	47	55	56
Italy	59	68	80
Spain	73	78	83
Netherlands	42	45	53

Source: RICS, European Housing review, various years.

HOUSEHOLD SECTOR RISKS: INTEREST RATE RISK

The risk of a significant deterioration in households' ability to service their debt in the near future seems rather low. However, the relatively high level of indebtedness of households leaves them more vulnerable to movements in interest rates, income and asset prices than in the past. In this context, it should be remembered that in some of the countries that experienced large increases in house prices over the past few years, the majority of mortgages are at variable rates. Some degree of myopia and imperfect understanding of risk could potentially explain why households appear to have overestimated the short-term benefits of floating rate contracts in some countries. This has contributed to an increase in household exposure to changes in interest rates.

The risk that interest rate changes might leave euro area households in a position whereby they cannot service their debt or whereby they have insufficient buffers to smooth consumption also appears limited. Even fairly strong increases in mortgage interest rates would leave the household interest payment-to-income ratio well below the levels seen in the early 1990s (see Box 6). The overall impact of any interest rate increase on households would depend on the context: for instance, if this increase were to be combined with a negative shock to income, it could seriously impair households' ability to service their mortgage debt. In addition, the macroeconomic effects would depend crucially on the distribution of debt across the household sector.[17]

17 See Debelle, G. (2004), *"Macroeconomic Implications of Rising Household Debt"*, BIS Working Papers No 153, June.

Box 6 Assessing the interest rate sensitivity of household mortgage debt in the euro area

The ability of the household sector to adapt to changing interest payments over the interest rate cycle can have potentially important consequences for financial stability. In simple terms, at an aggregate level, household exposures to changes in interest rates depend upon the share of outstanding debt whose contracted rate of interest will be subject to adjustment in the short run.[1] The higher the share of such debt in the total, the larger the effect on interest payments. In the absence of any offsetting growth in households' disposable income, an interest rate rise would have a negative impact on the sustainability of housing debt. This Box assesses the sensitivity of household mortgage debt in the euro area, going beyond a simple fixed versus floating distinction concerning the structure of mortgage contracts in individual countries.

It is important to distinguish between mortgages where the household sector bears the interest risk in the short run (defined here as up to and including one year) and mortgages where the household sector is protected from interest rate changes in the medium term. In particular, account should be taken of the fact that not all contracts that are usually described as being contracted "at variable rates" imply interest risk in the near future. This is because the concept

1 The evolution of interest rates (as well as expectations of future changes) can influence the type of contract chosen by new borrowers, thereby modifying the debt structure. Indeed, most borrowers would tend to chose short-term variable rates when interest rates fall and are expected to fall further, and fixed contracts when the rates are anticipated to have bottomed out. Other factors might play a role, including the level of financial education of borrowers, and the marketing policy of lenders (see for instance in Miles, D. (2004), *"The UK Mortgage Market: Taking a Longer-term View"*, March).

of "variability" has different meanings across Europe. Nevertheless, all types of mortgage contracts combine two key elements. First, there is an Initial Period of Fixation (IPF). This is the period of time during which the interest rate paid by the borrower is fixed and known in advance (with the time ranging between zero – in the case of a strictly variable-rate contract – and the whole duration of the loan – in the case of a purely fixed-rate contract). Second, there is a period of variability following the IPF (zero in the case of a purely fixed-rate contract), where variability could be more favourable either to the lender or to the borrower. The terms of the contracted mortgage interest rate can also take three forms. First, there are *referenced rates*. In such contracts, the mortgage rate follows an official index that is set in advance in the contract. Second, there are *renegotiable rates*, where the interest rate charged can be changed following bilateral negotiations between the lender and the borrower. The predetermined points in time when negotiation can occur are fixed within the loan contract. Third, there are *reviewable rates*. These are mortgage rates that can be changed at the initiative of the lender, not necessarily following a homogeneous rule. This all means that the impact of any rate change on repayment burdens will depend on the length of the IPF (up to or above one year), and the conditions under which the IPF rate will roll over to the new rate. For instance, loan contracts that include a switch to a predetermined rate or a series of rates agreed in advance would not be affected by a change in interest rate conditions.

Based on the limited data available[2], complemented by national sources and other evidence, a first estimate suggests that the share of outstanding mortgage debt that would be exposed in the short run to a change in interest rates represented around one-third of the total stock in the euro area in the second quarter of 2004. Of the remainder, the category of loans with an IPF of ten years appears to be of particular importance at a euro area level, reflecting the fact that this type of contract exists in many countries and is particularly important in Germany, France, Belgium and the Netherlands. Finally, the share of loans that are "locked in" to purely fixed rates throughout the loan duration (at all maturities) seems limited. However, when taking fixed-rate contracts with a long maturity (ten years and above) together with contracts with an IPF of ten years or above (the terms of which are rather similar in the short run), the estimated total share of quasi-fixed-rate mortgages rises to around 50%. This notwithstanding, these shares can differ widely across individual euro area countries. Moreover, given the important caveats with regard to data, these results should only be considered as a benchmark indicator.

Other characteristics of mortgage contracts can play an important role in dampening the overall sensitivity of household debt to interest rates. Variable-rate contracts may include a cap on the mortgage rate, defining an upper limit for the variation of the rate, which could be up to 1, 2 or 5 percentage points above the initial rate – which is the case in Belgium, France and to some extent in the Netherlands as well. Furthermore, the existence of prepayment options – repaying the loan before the maturity – with a low penalty provides households with the opportunity to take advantage of a more favourable interest rate environment (see Box 14). Some contracts allow households that are indebted at variable rates to modify the size of monthly repayments and/or the duration of the loan, in order to smoothen out the effects of a rate increase. This option could be used by some households to build up a prepayment buffer, allowing them to be "ahead" of their mortgage payments, if they perceive a low interest rate environment as being temporary.

2 The two main data sources centred on the IPF categories available at the euro area level (ECB and the European Mortgage Federation) present important limitations with respect to this analysis: they refer to new contracts, not to outstanding debt, recorded by original maturity/IPF. Information on the residual maturity of the outstanding contracts, which represents a central element of the interest rate sensitivity assessment, is not available.

In a study of the UK mortgage market, Miles (2004) presents evidence of UK borrowers myopic behaviour, who may be unaware of the risks involved with different mortgages. For example, many households, mostly first-time buyers, may tend to focus on the initial monthly repayment rather than on the long-term affordability. Given such myopia, borrowing at variable rates, they could behave as if the interest rate prevailing at the beginning of the mortgage was to be "fixed" over the entire duration of the contract, regardless of the current position in the interest rate cycle.

All in all the interest rate sensitivity of household mortgage debt cannot be gauged in a straightforward way. Quantitative estimates can complement qualitative information on the features of mortgage contracts, in order to provide a broader picture of exposures of mortgage debt to interest rate risk across euro area countries. It is clear that changes in interest rates will have different effects across countries. If mortgage debt-to-GDP ratios are high, but the typical contract includes a long period during which the interest rate is fixed, then a change in interest rates will have a relatively weak impact. By contrast, a high mortgage debt ratio combined with a high proportion of outstanding loans that are sensitive to changes in interest rates would present more risks. However, even then, if national consumer protection has resulted in favourable features in mortgage contracts, this could have a dampening effect.

III THE EURO AREA FINANCIAL SYSTEM

3 EURO AREA FINANCIAL MARKETS

3.1 KEY DEVELOPMENTS IN MONEY MARKETS

MONETARY POLICY RATES REMAIN UNCHANGED

Monetary policy interest rates in the euro area remained unchanged between June 2003 and mid-November 2004, with the minimum bid rate for the main refinancing operations remaining at 2%, although rate expectations were subject to some fluctuations throughout the year. The strength of oil prices after the summer gave rise, however, to expectations that the next rate change would be a hike, although this was not foreseen before the end of 2004. In this vein, in mid-November 2004, expected EONIA rates derived from short-term swaps were fully pricing first a 25 basis points rate hike during the second quarter of 2005 and some likelihood of a further hike of the same magnitude during the third quarter.

GENERAL MONEY MARKET CONDITIONS REMAIN FAVOURABLE

In euro money markets, it is notable that the importance of secured transactions in euro money markets, as measured by transaction volumes, has continued to grow (see Box 7). The spreads between uncollateralised interbank money market interest rates and collateralised repo rates can provide an indication of how money market participants perceive counterparty credit risks. These spreads widened in 2002 when some concerns surfaced about strains in some segments of the euro area banking industry. After late 2003, however, these spreads oscillated within relatively narrow ranges, regardless of the maturity, and remained close to historical norms (see Chart S25). This suggests that perceptions of counterparty credit risks have remained rather low. Bid-ask spreads can provide indications of liquidity conditions in different segments of the money markets. Since late 2002, these have generally remained rather low, reflecting high market liquidity. In the EONIA swap market,

Box 7 Structural trends in euro money markets

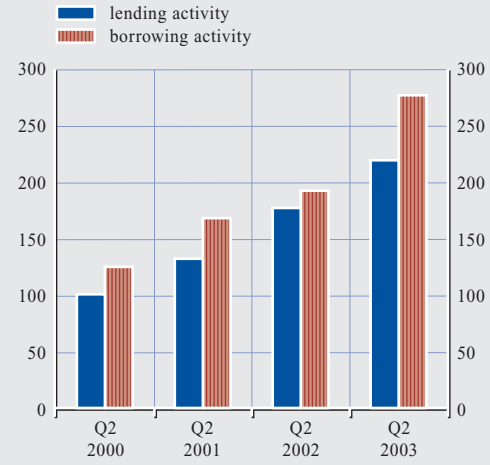
A recent study of the euro money markets undertaken by the ECB[1], based on data for the second quarter of 2003, sheds some light on structural developments in different segments of these markets. This Box reports on the main findings of this study and particularly highlights two important trends that were identified. First, the relative importance of unsecured deposit markets continued to decline, which benefited secured products. This might reflect a growing preference on the part of market participants for limiting credit risk exposures. Second, euro money market derivatives continued to grow in importance. Improving depth and liquidity in these markets can contribute to financial stability by facilitating the transfer and broader dispersion of interest rate risks from those who would rather not bear them to those who are able and willing to do so.

Overall, turnover expanded in all segments of the money market in 2003 compared with 2002. Even in the unsecured deposit markets, volumes rose by 24% in 2003, as opposed to a decline of 18% in 2002. This meant that turnover was 5% higher than in 2000, when data were collected for the first time. In the secured repo markets, which overtook the deposit markets as the most actively traded money market segment in 2002, there was continued strong growth. A rise of 34% in 2003 brought the volumes traded to more than double the amounts traded in 2000 (see Chart B7.1). Turnover increased even more rapidly in the OTC derivatives markets: foreign exchange swaps rose by 57% in 2003, interest rate swaps (other than overnight index swaps) by 36%, while overnight index swaps more than doubled compared with 2002 (see Chart B7.2).

1 See ECB (2004), *"Euro Money Market Study 2003"*, 16 January. The study is based on data received from a sample of credit institutions, implying that results must be interpreted with caution, as they are not necessarily representative of the euro money market as a whole.

Chart B7.1 Secured cash borrowing and lending

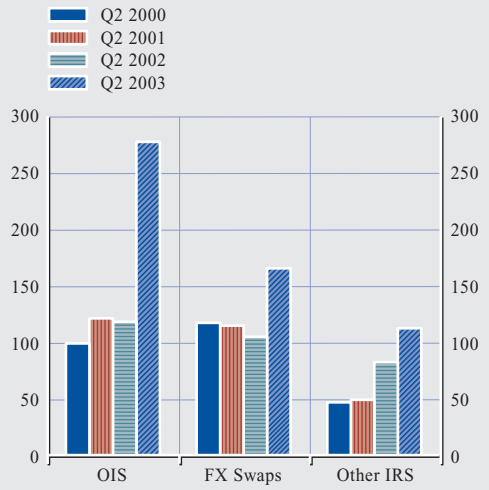
(cash lending in 2000 = 100)



Source: ECB.

Chart B7.2 Activity in selected derivatives markets

(OIS turnover in 2000 = 100)



Source: ECB.

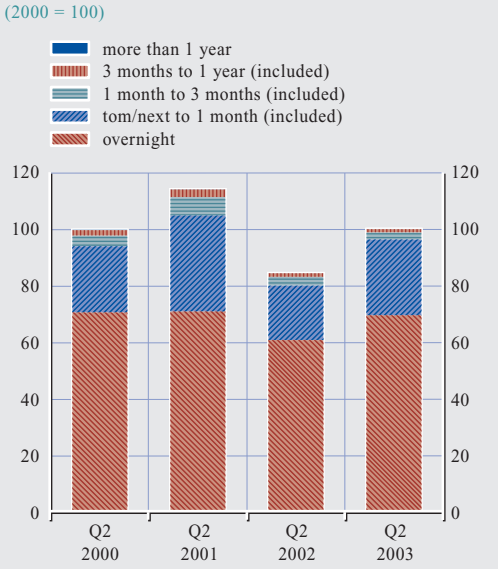
Note: The charts only provide turnover data on a relative basis. In Chart B7.1 the secured cash borrowing in Q2 2000 represents the 100 level, while Chart B7.2 depicts the Q2 2000 turnover in the overnight index swap (OIS) markets.

As in earlier years, the 2003 data confirm that activity in the euro money market tends to be highly concentrated in short maturities. In the unsecured deposit markets, for example, the share of overnight transactions in overall trading volume stood at around 70%, showing little change compared with the previous years (see Chart B7.3).[2] In the repo markets, the bulk of transactions took place in the segment between tom/next and one month, which accounted for 80% in 2003, up from 78% in 2002 (see Chart B7.4). Overnight maturity appears to be significantly less important in the repo markets than it is in the deposit markets. This is probably explained by technical difficulties linked to collateral settlement in this very short tenure. When the overnight maturity is excluded, the gain in importance of secured repo markets relative to the unsecured deposit markets is clear. In 2000 the respective shares were 35% for deposits and 65% for repos, while in 2003 they stood at 20% and 80% respectively. This development seems to mainly reflect banks' general aim of limiting their credit risk exposure, thereby contributing positively to financial stability.

In money market derivatives there are also indications that turnover tends to be highly concentrated in the shortest maturities. In the overnight index swap (OIS) market, the share of transactions with maturities of up to one month increased from 39% in 2000 to 57% in 2003. In foreign exchange swaps this share was even higher (at 83% in 2003), although no discernible trend is apparent over recent years.

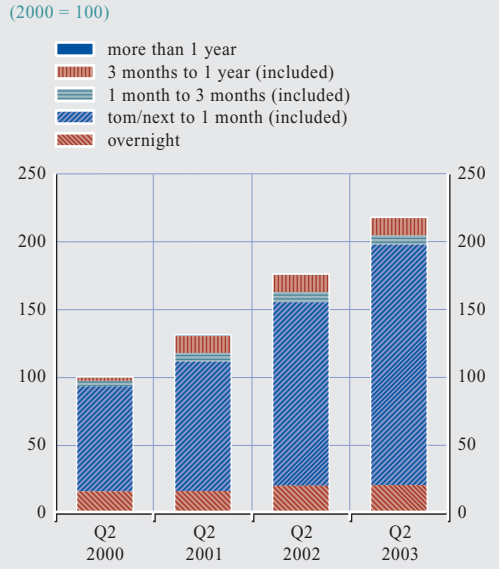
2 It should be noted that data on the number of transactions are not weighted by maturity. Hence, these figures should not be seen as an indicator of the amounts outstanding of interbank lending. For instance, if the amounts outstanding of overnight and one-week deposits were, on average, identical in size, the number of transactions in the overnight maturity would need to be five times (i.e. five working days) higher than the number of transactions in the one-week maturity.

Chart B7.3 Unsecured cash lending by maturity



Source: ECB.

Chart B7.4 Maturity breakdown in secured lending



Source: ECB.

Note: The charts only provide turnover data on a relative basis. In both charts the overall lending amount in Q2 2000 represents the 100 level.

Market concentration can provide a good indication of the market's dependency on individual market participants and the risks for the market if a significant counterparty were to exit. Overall, as in 2002, the ECB Money Market Study for 2003 reveals that the euro money markets are generally still rather concentrated. In the deposit markets, this concentration is least pronounced, with the ten largest market participants accounting for "only" one-third of the overall market. The repo market, however, is significantly more concentrated with the ten most active banks accounting for around 54% of the overall repo turnover. Finally, the OTC derivatives markets are the most concentrated. Here, the share of the ten most active banks varies between 71% (overnight index swaps) and 84% (cross-currency swaps). This indicates that it cannot be excluded that a potential failure of one of the major market players could lead to severe frictions in the functioning of these markets.

for example, spreads remained between 1 and 3 basis points (see Chart S26), with the exception of a recent increase for the one-week maturity.[1] Overall, this suggests that market participants faced little difficulty in accessing short-term funding, which is a positive feature for financial stability.

3.2 KEY DEVELOPMENTS IN CAPITAL MARKETS

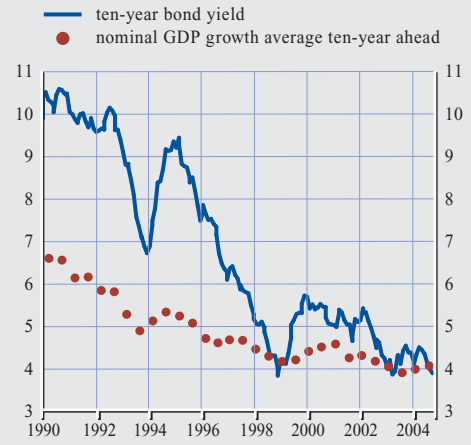
GOVERNMENT BOND YIELDS

Long-term bond yields in the euro area remained confined within a narrow range between late

1 The increased volatility of the EONIA towards the end of the maintenance periods in October and November 2004, led to a decrease in liquidity in short-term EONIA swaps. As a consequence, banks tended to quote in larger spreads.

Chart 3.1 Euro area ten-year bond yield and consensus nominal GDP growth expectations

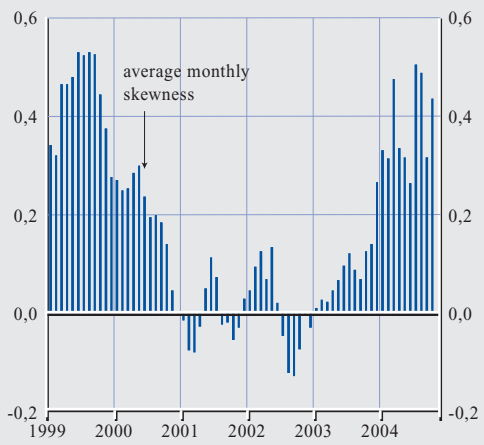
(Jan. 1990 – Nov. 2004, % per annum)



Sources: Reuters, Consensus Economics and ECB calculations.
Notes: Consensus long-term nominal GDP growth expectations equal average one to ten-year ahead inflation and real GDP growth forecasts with the same horizons.

Chart 3.3 Option-implied skewness coefficient for ten-year bond yields in Germany

(Jan. 1999 – Oct. 2004)

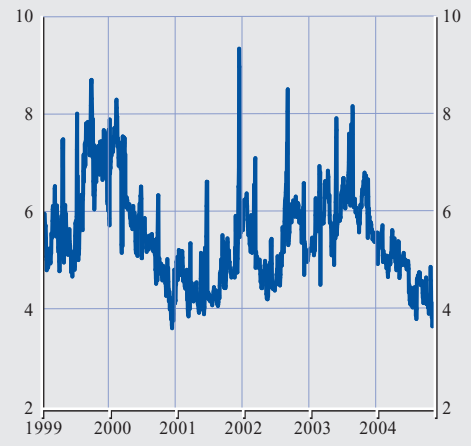


Sources: Eurex and ECB estimation.

2003 and mid-November 2004. While subject to similar swings as in the US after late 2003, patterns in euro area bond markets were less pronounced and euro area bond yields tended to track long-term consensus expectations for nominal GDP growth rather closely (see Chart 3.1).

Chart 3.2 Implied bond market volatility in the euro area

(Jan. 1999 – Nov. 2004, % per annum)



Sources: Bloomberg and ECB calculations.

Implied bond market volatility – an indicator of market expectations of the ranges within which bond yields may move in the period ahead – dropped significantly throughout 2004 in euro area bond markets (see Chart 3.2). However, this does not exclude the possibility that yields could be subject to some further upward pressure in the months ahead. One indicator that can shed light on the likelihood that market participants attach to the possibility of a large increase in long-term bond yields is the skewness in the probability distribution functions derived from bond futures' options prices. Positive values for this indicator throughout 2003 and 2004 suggest that market participants were not excluding the possibility of a sudden upturn in long-term yields (see Chart 3.3). These perceptions may have been linked to the low level of US bond yields.

EQUITY MARKETS

Equity markets in the euro area benefited from the improved economic outlook, relatively low interest rates, and efforts made by companies to put their balance sheets onto a more solid footing. In this environment, earnings growth

improved and analysts' expectations of short and long-term earnings growth remained relatively stable at high levels (see Chart 3.4). Correlation with US stock price movements was relatively high and stock prices in the euro area as measured by the Dow Jones EURO STOXX consolidated on the significant gains seen after March 2003 (see Chart S27). Additionally, implied volatility declined to a very low level by late 2004.

By mid-November 2004, price-earnings ratios for the euro area remained close to historical averages (see Chart S28), and the tightening of expected frequency distributions associated with low levels of stock market volatility implied in stock options – a yardstick of stock market uncertainties – suggested that market participants were not pricing in the possibility of sizeable changes in stock prices over the short term (see Chart S29).

Issuance conditions in the euro area equity markets were difficult in 2001 and 2002 following the sharp decline in stock prices, global corporate malfeasance-induced stock market volatility and geopolitical uncertainties. Subdued M&A activity may have further reduced corporate demand for external capital. The gradual upturn in economic activity, and the reversal of stock prices from March 2003 onwards, did not prompt a resurgence of issuance activity until early 2004.

The notable decline in stock price implied volatility may have made it easier to issue equity through secondary public offerings (SPOs) after mid-2003 (see Chart 3.5). Later on, the IPO markets began to recover in late 2003 and early 2004. However, the number of IPOs by non-financial corporations in the first half of 2004 in the euro area only amounted to around 40% of the total number recorded in 2002. By October 2004, deals in the pipeline also suggested further improvement in issuance in the months to come.

Although aggregate data for the euro area reveal some encouraging signs, there have been significant differences across countries. Indeed, particularly in Germany, the experience of the first three quarters of 2004 was rather disappointing, and half of the eight announced IPOs had to be cancelled, even though

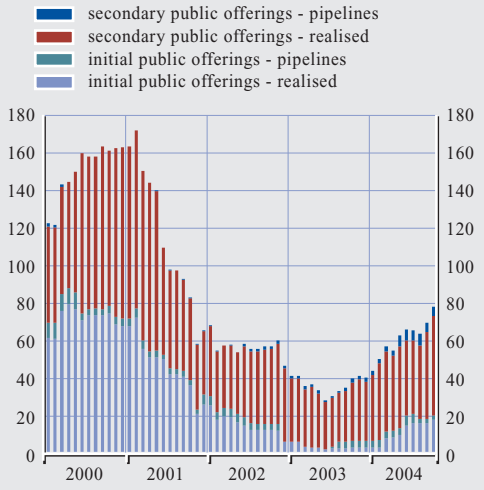
Chart 3.4 Dow Jones EURO STOXX expected and actual annual growth in earnings per share (EPS)

(Nov. 1999 – Oct. 2004, % growth per annum)

Source: Thomson Financial Datastream.

Chart 3.5 Gross equity issuance and pipeline deals in the euro area

(Jan. 2000 – Oct. 2004, EUR billions, 12-month moving sums)



Source: Thomson Financial Datastream.

preparations were already relatively advanced.[2] Moreover, even the flotation of a large well-known retail bank seemed to be at risk during the book-building phase, and only the lowering of the price band and an allotment at the lower end of this reduced price band finally guaranteed the success of this IPO.

CORPORATE BOND MARKETS

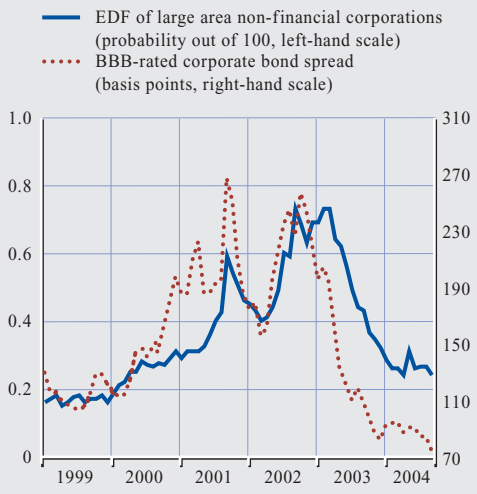
The ongoing recovery in stock prices, together with lowered equity market uncertainty, contributed to very compressed levels of lower-grade corporate bond spreads in the euro area throughout 2003 and 2004 (see Chart S31).

Balance sheet repair, the recovery of profits and the resulting overall improvement in credit quality – whereby more ratings were revised upwards than downwards – appear to have played an important role in this. A further technical factor appears to have been the growth of the market for collateralised debt obligations (CDOs), which has facilitated arbitrage in corporate bond markets and has possibly had more lasting effects on pricing. Additional demand for corporate bonds resulting from arbitrage transactions might in part have been responsible for the lowering of corporate spreads, although it is difficult to quantify the influence of this.

Although fundamental factors were clearly at play, it cannot be excluded that a further factor driving spreads narrower was the search for yield among investors that characterised global financial markets in an environment of low interest rates and limited supply of securities, irrespective of ratings. This hypothesis is supported by several factors. First of all, the decline in corporate bond spreads took place in an environment of declining government bond yields, a factor that is typically associated with a widening of spreads: low interest rates, all else being equal, raise the net present value of future liabilities. Second, the narrowing of BBB spreads was more pronounced than the decline in expected default frequencies (EDFs) – a more direct measure of credit risk – for large firms

Chart 3.6 Euro area large corporations' bond spreads and expected default frequencies (EDF)

(Jan. 1999 – Sep. 2004)



Sources: Thomson Financial Datastream and Moody's KMV.

(see Chart 3.6). Third, after late 2002, when spreads began to narrow globally, a remarkably high correlation developed between US and euro area BBB rated corporate bond spreads (see Chart 3.7). This was notable because even though corporate balance sheet repair took place in both corporate sectors after mid-2002, the degree of adjustment of corporate debt-to-GDP ratios was far more pronounced in the US. Moreover, the short-term economic outlook in the US became brighter than in the euro.

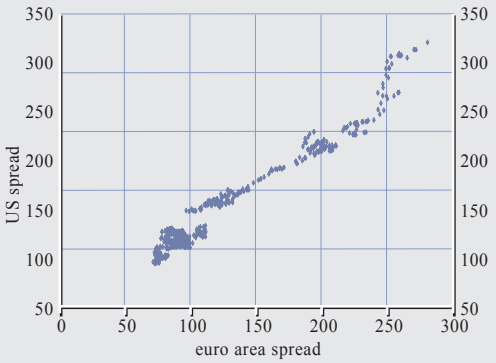
Ultimately, to the extent that there may not have been sufficient discrimination in the pricing of credit risks in euro area corporate bond markets, it may prove necessary for corporations to undertake further balance sheet repair in order to hold spreads down, particularly if long-term interest rates start to increase.

As for financing conditions, it took some time before corporations took advantage of low funding costs in corporate bond markets.

2 According to estimates, these four cancelled IPOs would have accounted for an overall volume of around EUR 3.3 billion; the poor performance has also reportedly discouraged some other companies that were considering a flotation.

Chart 3.7 BBB rated corporate bond spreads in the US and the euro area

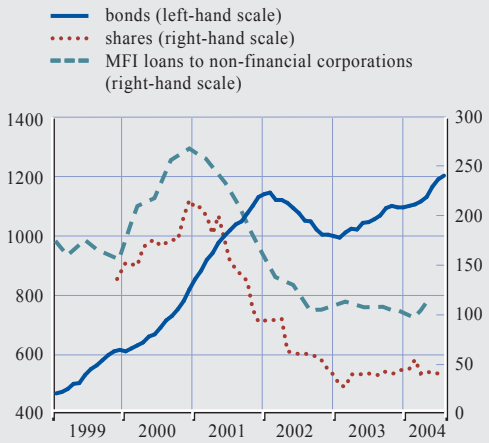
(Okt. 2002 – Nov. 2004, basis points)



Sources: Thomson Financial Datastream.

Chart 3.8 Bond, equity and loan issuance in the euro area

(Jan. 1999 – Aug. 2004, EUR billions, 12-month moving averages)



Source: ECB.
Note: "Bonds" refers to euro-denominated debt securities issued by the private sector, and "shares" refers to euro-denominated quoted shares issued by non-financial corporations.

Corporations appeared to shy away from raising new funds through debt securities issuance, partly because of ongoing efforts to reduce relatively high debt ratios. The compression of spreads in corporate bond markets may have fuelled renewed buoyancy in issuance activity in corporate bond markets in 2004.

Compared to bank lending and net equity issuance, the rise in corporate bond issuance activity was notable (see Chart 3.8). To some extens this appears to reflect improving liquidity conditions in these markets which, on balance, should favour financial stability (see Box 8). However, corporate bond issuance patterns show that issuance activity by the lowest-rated companies picked up significantly after mid-2003, possibly pointing to an overall deterioration in the credit quality of the debt stock (see Box 5).

Box 8 Structural trends in euro bond markets

A broadening of alternative sources of bond finance can contribute to financial stability by enhancing the diversity of financing options available to agents in need of funds. For instance, the coexistence of corporate debt securities markets and bank financing is beneficial to the stability of corporate financing. Likewise, the development of markets for bonds that are tied in some way or another to mortgages – such as covered bonds and mortgage-backed securities – can help banks to match their assets and liabilities more successfully; they can also facilitate a wider dispersion of the interest rate risks that are associated with mortgage lending (see also Box 14 on the distribution and management of prepayment risk in European mortgage markets). Moreover, as liquidity in bond markets improves, issuers benefit from enhanced flexibility. This means that funding needs can be quickly and easily satisfied. This Box highlights some key structural developments that took place in the euro-denominated bond market between 1999 and 2003 and which are relevant for financial stability.

Chart B8.1 displays the structure of euro area bond markets in terms of issuers. The government bond market, which was the dominant segment in terms of issuance in 1999, has since then been broadly similar in size as issuance by financial institutions (other monetary financial institutions). After four years of broad stagnation, the issuance by financial institutions grew strongly in 2003. Within this segment, unsecured bonds still represent the highest issuance. However, a rather dynamic market segment is the euro covered bond market – a market for bonds issued by banks to fund mortgage loans and, in some countries, loans to the public sector. Furthermore, issuance of asset-backed securities, including mortgage-backed securities, is increasing. The euro corporate bond market (non-financial and non-monetary financial corporations), which constitutes the third largest issuer segment, grew significantly after the launching of the euro. The remaining issuer segment is issuance by supranationals.

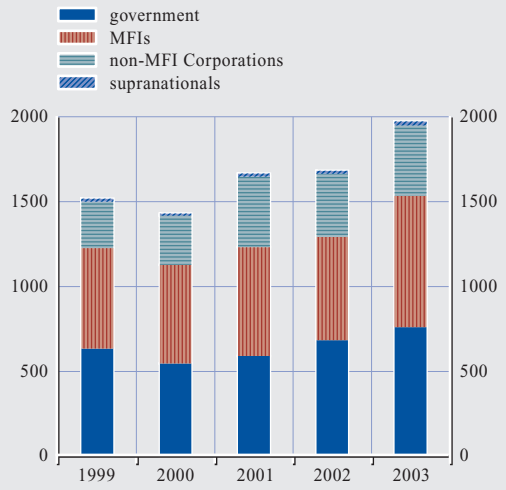
Apart from growth in the extent to which private sector issuers have been tapping bond markets for funds, there has been a significant improvement in the liquidity of bond markets. Since 1999, the trend has been towards larger issue sizes. Whereas in 1999 the share of issues over EUR 2 billion was around 30%, it grew to slightly more than 40% in 2003 (see Chart B8.2).

From a financial stability perspective, there have been some notable developments in the euro covered bond and corporate bond markets. Chart B8.3 shows the geographic composition of issuers in the euro covered bond market.[1] Overall, the euro covered bond market amounted to around EUR 1.3 trillion at the end of 2003. Around EUR 0.9 trillion of these bonds were covered by loans to the public sector, with more than 90% issued by German banks. Around EUR 0.4

1 It should be noted that while the chart provides an approximate indication of the relative market sizes, exactly comparable figures are not available. Moreover, the new issuance of a large covered bond by a single bank, as demonstrated in 2003, can influence the percentages.

Chart B8.1 Gross issuance by issuers in the euro-denominated bond market

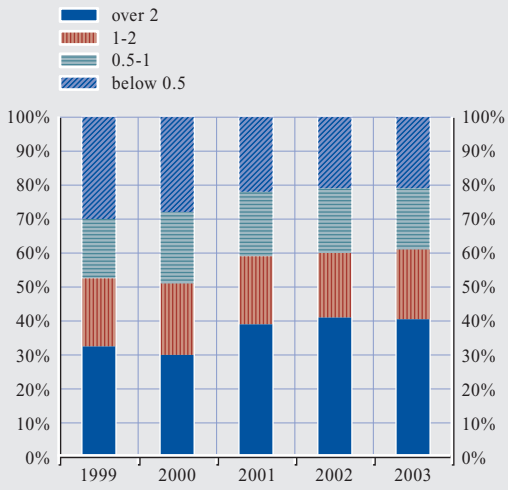
(EUR billions)



Source: ECB.

Chart B8.2 Gross issuance by issue size in the euro-denominated bond market

(EUR billions)



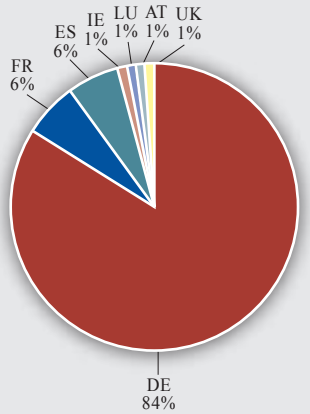
Source: European Commission.

trillion bonds were covered by mortgage loans.[2] The issuance of covered bonds declined between 1999 and 2001, mainly due to a sharp reduction in the issuance of German Pfandbriefe. A recovery subsequently got underway as issuance of covered bonds in other European countries began to increase. Much of this was due to product innovation, such as the development of structured covered bonds, and to enhancements to national covered bond legislation. Moreover, even in the absence of covered bond legislation, the issuance of euro-denominated covered bonds was stepped up in the UK – under UK common law and private contract law – in 2003 and 2004. From a financial stability perspective, covered bonds provide a means for mortgage banks to fund, via the capital market, long-term fixed-rate mortgage loans, and, in general, allow a better matching of banks' assets and liabilities when compared to funding via retail deposits.

The euro corporate bond market witnessed exceptional growth after 1999 (see Chart B8.4).[3] While in 1999 this market had been predominantly open to the highest quality credits, the market broadened to facilitate the funding needs of riskier issuers. In general, a maturing euro corporate bond market adds to the diversification of corporate financing. At times, bank lending does however prove to be the stabilising factor in corporate financing. As such, it is beneficial to the stability of corporate financing if both corporate debt securities markets and bank financing are available.[4] Likewise, the more comparable in size the different sources of financing are, the greater the benefits from having multiple avenues of corporate finance and the larger the number of companies that have access to both bank financing and debt securities markets. In this respect, the euro corporate bond market may still have to expand further.

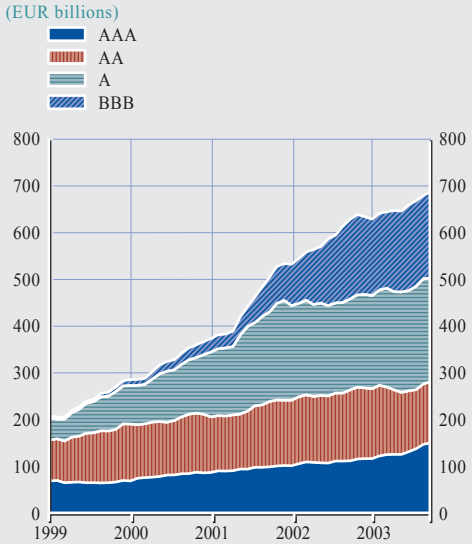
2 By comparison, Danish mortgage bonds are outstanding for an amount equivalent to around EUR 0.2 trillion.
3 See Baele et al. (2004), *"Measuring Financial Integration in the Euro Area"*, ECB Occasional Paper Series, No 14. It should be noted that the chart displays amounts outstanding only of investment-grade corporate bonds with a minimum issue size of EUR 100 million, and which are included in the Merrill Lynch EMU Corporate Bond Index.
4 See Davis, E. P. (2001), *"Multiple Avenues of Intermediation, Corporate Finance and Financial Stability"*, IMF Working Paper, No 01/115.

Chart B8.3 The euro covered bond market



Sources: European Mortgage Federation and ECB calculations.

Chart B8.4 The euro corporate bond market



Source: ECB.

Overall, the euro bond market has witnessed substantial growth and it has increased its share in the global bond market since 1999 at the expense of the US bond market. In addition, the euro bond market is now characterised by a wider variety of individual products. As an important structural development, a continued broadening of financing options and in particular a further increase in private sector issuance could in general contribute to financial stability in the euro area.

4 THE EURO AREA BANKING SECTOR[1]

4.1 STRUCTURAL DEVELOPMENTS IN THE BANKING SECTOR

Structural changes in the banking industry, although slow moving, can have important longer term consequences for financial stability for several reasons. For instance, strategic choices made by banks can affect profit and risk trade-offs and cost efficiency, and can ultimately have a bearing on the shock-absorptive capacity of the banking system. Consolidation can change the ways in which banks are linked to one another and, if banks expand into new activities such as insurance, they can change their longer-term risk profiles. This section reviews some of the key structural changes that have taken place in the euro banking sectors which may have more lasting consequences for financial stability.

CONSOLIDATION WITHIN DOMESTIC MARKETS

In the period between 1997 and 2003, nearly 2,300 euro area credit institutions, or 25% of the number that existed in 1997, had disappeared. During 2003 alone, their number declined by 4.5%, or 308 institutions, bringing their number to less than 6,600 (see Chart S33). The trend towards consolidation was motivated by banks' desire to grow, to achieve economies of scale, to reduce costs and to enhance efficiency. The latter entailed a restructuring of branch networks in many euro area countries. On average, branch networks were reduced by 2.5% during 2003, and by 9.4% (almost 17,000 branches) over the period between 1997 and 2003. Employment levels were also scaled down, beginning in earnest in 2001, resulting in a cumulative reduction in the number of employees by 75,000 in two years (see Chart S33). Consolidation is expected to continue, especially in the segment of cooperative and public banks, as a result of ongoing reforms in ownership structures.

As a result of these consolidation measures, concentration indices for the euro area increased, although they still remained rather low. The average market share of the five largest domestic banks in their local markets increased from 46% in 1997 to 53% in 2003.

The consolidation process may be improving the resilience of the euro area banking system, since it has provided banks with larger capital buffers, and larger banks typically have more advanced risk management systems. In the short run, however, the consolidation process may have had some negative effects on performance, since it takes some time before cost and revenue synergies are obtained.

INTERNATIONALISATION

Similar to the patterns seen between 2001 and 2003, mergers and acquisitions (M&A) activity in the banking industry in the first half of 2004 continued to be rather subdued (see Chart S34). The M&A volume remained low as did the number of deals. This contrasted markedly with the significant degree of M&A activity involving large credit institutions that took place in the run-up to and in the early years of the Economic and Monetary Union, spanning the period 1998-2000. In the past ten years, cross-border M&A within the euro area banking industry constituted only 10-15% of total M&A activity, which compares to around 40% for other industrial sectors over the same period.

Towards the end of 2004, there were some expectations that M&A activity may pick up, fuelled by higher stock market valuations, the presence of excess capital in the banking sector and competitive pressures.[2] In the next few years, cross-border M&A might increase in importance, since domestic markets have become increasingly concentrated and the potential for domestic mergers has been drying up in many smaller euro area countries. The recently adopted EU Takeover Directive

1 The Banking Supervision Committee (BSC) was closely involved in the preparation of this section and the analysis draws heavily on the BSC report entitled *"EU banking sector stability"*, November 2004.

2 See, for instance, Moody's (2004), *"Mergers and Acquisitions in European Banking: Between Myth and Reality"*, June.

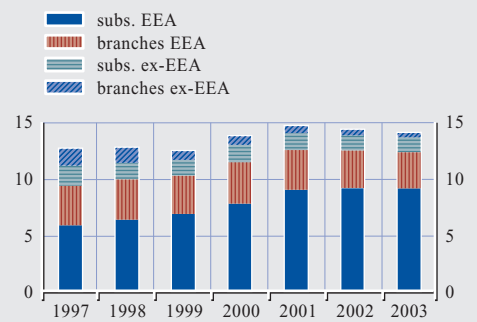
may also make cross-border M&A easier in the future. However, differences in tax, laws, the functioning of the judicial system and in consumer protection rules and cultural barriers will have to be overcome.

Since market concentration in the domestic market is often very high, euro area banks have expanded on a cross-border basis in order to grow. To this end, banks have been faced with a choice between commercial presence abroad through M&A or by setting up a new bank, and the cross-border provision of financial services. Commercial presence abroad through foreign branches and subsidiaries accounts for nearly 15% of euro area banking sector assets (see Chart 4.1). This figure has been relatively stable over time but conceals the increasing importance of European Economic Area (EEA) subsidiaries and the decreasing importance of non-EEA branches and subsidiaries, which reflects the better opportunities for euro area banks of setting up cross-border activities in the single euro area banking market.

To some extent, decisions on cross-border presence may be influenced by regulatory arbitrage, for example if banks decide to locate their headquarters in countries with lighter regulatory or supervisory burdens or more favourable tax regimes.

Chart 4.1 Share of foreign-owned assets in the euro area banking sector

(1997 – 2003, %)



Source: ECB.
Note: The total balance sheet concept is not harmonised across euro area countries.

Cross-border banking has grown significantly, especially in the fields of interbank loans and securities holdings, but not so much in the area of cross-border bank lending (see Chart S35). This reflects the fact that wholesale euro area banking markets are largely integrated, whereas retail banking remains highly segmented. The latter can be attributed to the need for proximity to customers as well as to regulatory and cultural barriers.

Increased cross-border activity supports banks' cross-country diversification strategies, thus possibly increasing banks' revenues. However, an increase in cross-border activity may also entail higher risks for banks if shocks in one country were to spill over to other economies, for example through the interbank market or the highly integrated securities markets.

CROSS-SECTOR COMPARISONS AND LINKAGES

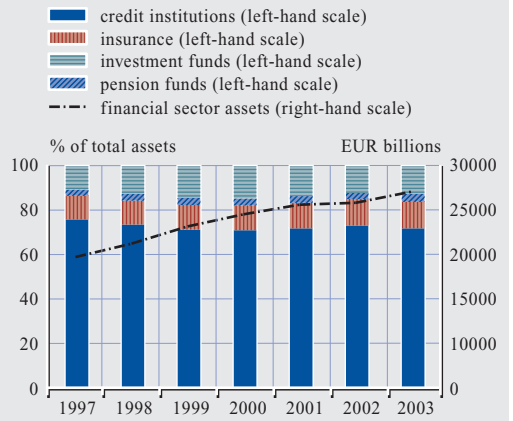
A comparison across different financial sectors in the euro area shows that banks remain predominant, maintaining a relatively stable share in the total assets of the financial industry (see Chart 4.2). This also indicates that the different euro area financial sectors – banking, insurance, investments and pension funds – have all grown at rather similar rates.

A comparison of the domestic credit-to-GDP ratio, which stood at almost 150% in 2003, with a stock market capitalisation-to-GDP ratio of around 70% in 2003, shows that euro area banks remain predominant in financial intermediation. The ratio of banking sector assets to GDP, a yardstick of the importance of the financial services provided by banks relative to the size of the economy, reached more than 260% in 2003 for the euro area, a rise of 4 percentage points compared with 2002 and 30 percentage points compared with 1997.

Banks and insurance companies have been increasingly cooperating as single financial services providers. The main goal of, and reason for, the emergence of the bancassurance

Chart 4.2 The relative importance of various financial sectors in the euro area

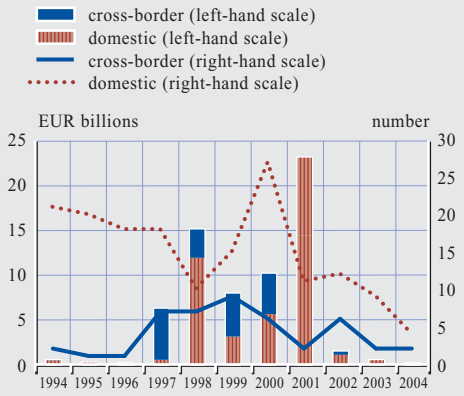
(1997 – 2003)



Sources: ECB and Banking Supervision Committee (BSC).
Note: The aggregation of the four sectors may not sum up to the entire financial sector, as some other financial intermediaries (e.g. non-bank leasing and factoring companies) are left out in some euro area countries.

Chart 4.3 Mergers and acquisitions (M&A) between euro area banks and insurance companies

(1994 – 2004)



Source: Thomson Financial (SDC Platinum).
Note: Cross-border deals refer to inter-euro area M&A. The number of deals includes both deals with and without reported value. Figures for 2004 cover the first half of the year.

model is to increase revenues by expanding into related areas and new markets. A further motivation is the possibility of diversification benefits through risk reduction and income smoothing. Cross-sectoral M&A between euro area banks and insurance companies, however, subsided after 2001 (see Chart 4.3). In the first half of 2004, only six deals were completed, of which four were domestic M&A transactions. By contrast with banking sector M&A, the percentage of cross-border deals has been slightly higher (between 20% and 30% over the last ten years).

Consolidation within and across borders as well as within sectors should lead to greater diversification of activities on the part of individual institutions. By making them less reliant on any single region or product line, this should contribute positively to financial stability in the euro area. Looking ahead, these tendencies will remain important drivers for change over the coming years. The euro area banking system is becoming more integrated and, as a result, competitive conditions will probably intensify. Inefficiencies are likely to be exploited owing to the increasing ease of entering banking markets abroad or providing cross-border financial services. This also means that inefficient institutions are unlikely to survive in the long run.

4.2 FINANCIAL CONDITIONS IN THE BANKING SECTOR

PROFITABILITY AND SOLVENCY

Profitability has strengthened, but some weakness remains

The profitability of the euro area banking sector improved in 2003, after having declined for two consecutive years. Indications are that a further strengthening of profitability took place in the first half of 2004. However, the consolidation of the improvement in banks' performance will ultimately depend upon the sustainability of the economic recovery, both at the euro area and the international level.

The average return on equity (ROE) of euro area banks, based on consolidated banking data, increased from 7.6% in 2002 to 7.9% in 2003 on aggregate (see Chart S36 and Table S5). Similarly, the percentage of banks with an

ROE of less than 5% fell considerably between 2002 and 2003, indicating a strengthening of profitability conditions across the weakest banks. Return on assets (ROA) levels also increased for euro area banks between 2002 and 2003 (see Table S5).

Notwithstanding the broadly positive conditions on aggregate, differences across countries in the euro area remained substantial. In at least one large banking sector, the aggregate ROE decreased in 2003 from the already very low level recorded in 2002.

Though the data are still preliminary on euro area banks' results for the first half of 2004, the indications are that positive profitability trends continued. The available data on the condition of banks for a sample of 50 large euro area banks (see Box 9 and Table S9) showed a pick-up in income generation and continued cost-cutting.

Diverse growth in banking income in 2003, with improvements strongest in non-interest income

Net interest income of euro area banks fell in 2003, both as a percentage of total assets and of total income (see Table S5). In banks' balance sheets, the share of total loans and advances to customers also fell as a share of total assets in 2003 (see Table S7). Nonetheless, the loan book remained the major interest-bearing asset class held by banks with loans to customers constituting almost 50% of banks' assets in 2003 (see Table S7).

Data on an unconsolidated basis can be used to gauge the divergent lending patterns in 2003 across banks' customers. The annual growth of new lending to households for house purchase was 7.9% as at December 2003 in the euro area as a whole (see Chart S37). Overall lending to households grew at a rate of 5.8% over the same period. On the other hand, lending to non-financial firms grew at a much slower pace, reaching a level of 2.2% in December 2003.

Box 9 Financial conditions of 50 large euro area banks

This box provides an assessment of performances in the euro area area banking sector during 2004 based on information provided in the published accounts of 50 large euro area banks. Historical data for these institutions also serve to complement the analysis in the main text. The 50 institutions were chosen because they represent a significant share of the assets of the domestic banking systems in individual euro area Member States.[1]

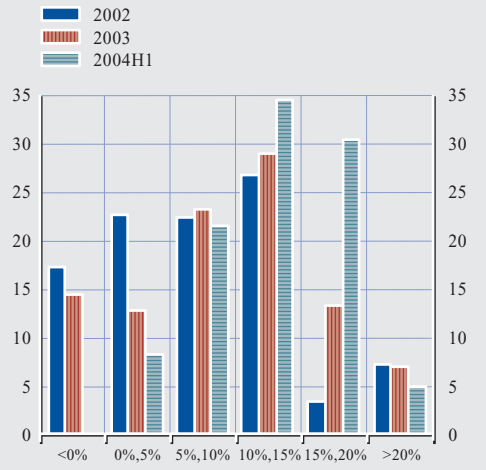
Overall, it appears that the condition of the 50 large banks in the euro area sample continued to improve in the first half of 2004, mainly driven by continued cost-cutting and reduced provisioning. However, income from traditional intermediation and trading activities weakened, clouding an otherwise positive outlook for large euro area financial institutions.

Profitability. While some of the banks in the group posted weaker profits in 2003 than in 2002, aggregate profitability increased, as measured by ROE after taxes and extraordinary items, to 6.7% in 2003 from about 6.1% in 2002.[2] There are also tentative indications that the

1 The banks were selected on the basis of their total assets and because they are generally active in more than one European country. The sample of banks remains the same over the reference period. Where the group owns substantial insurance operations, only the figures for the banking operation are taken into account. The comparability of banks' annual results could be affected by different accounting standards.

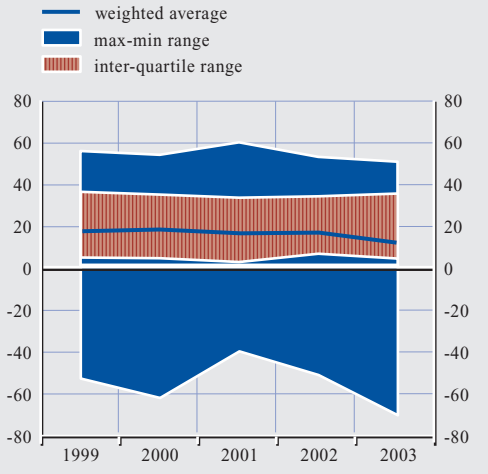
2 All figures in the text refer to weighted averages unless otherwise stated. The averages are weighted by each institution's total assets. The figures for the first half of 2004 (2004 H1) are based on non-audited interim reports. For 2004 H1 the sample covers approximately 40 euro area banks. Several institutions report an ROE only on a before-tax basis for 2004 H1 and are not included in the aggregate indicator, which calculates ROE after tax and extraordinary items.

Chart B9.1 Frequency distribution of ROE for large euro area banks



Source: ECB calculations based on published accounts.
Note: Data for 2004H1 are unaudited and are not based on the full sample.

Chart B9.2 Customer funding gap for large euro area banks



Source: ECB calculations based on the annual accounts of individual banks.
Note: The gap is calculated as the difference between customer loans and deposits expressed as a percentage of customer loans.

performances of these institutions improved in the first half of 2004 with an (annualised) ROE of 8.3%. Moreover, banks in the weakest performing quartile also managed to improve their ROE.

Income developments. Net interest income continued to decline from around 1.22% of total assets in 2002 to around 1.18% in 2003 and to 1.12% in the first half of 2004 (on an annualised basis). Even though loan volumes have grown over the past three years, this was insufficient to counteract the negative effects of a narrowing of interest rate margins on interest income. The narrowing of margins resulted from relatively low nominal interest rates and increased competition in some market segments. During the past years this narrowing has been further intensified by the need to use alternative (usually more expensive) sources of funding to cover the gap between the funding needs and availability of customer deposits (see Chart B9.2).[3]

Turning to non-interest income, interim financial statements (for banks that publish them) indicate that the exceptional trading profits made by many institutions in 2003 in an environment of buoyant stock markets are unlikely to be repeated in 2004 as a whole. On the other hand, a sizeable proportion of banks reported an increase in fee and commission income.

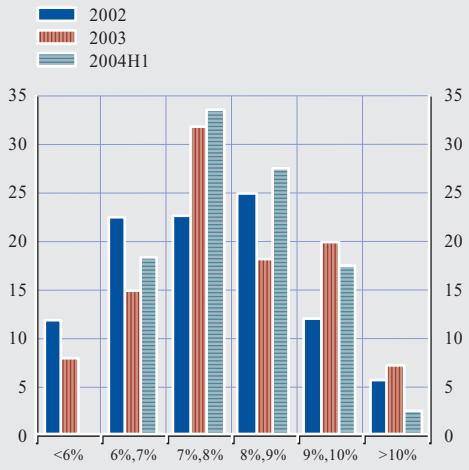
Provisions and costs. On average provisioning for loan losses fell from 0.32% of total assets in 2002 to 0.26% in 2003. The main factor behind this development, according to the published accounts of banks, was an improvement in credit risk related to the economic recovery. Indications from the financial results reported for the first half of 2004, as well as for the third quarter for some banks, are that they will fall again for 2004 as a whole, thus contributing to

3 Customer funding is defined as non-bank deposits. These include deposits from non-financial corporations, government and households. Customer loans are defined in a similar manner. Market funding includes issuance of debt securities such as medium-term notes, repos and unsecured interbank borrowing.

boosting profitability. The latest indications from the October 2004 ECB Bank Lending Survey tend to corroborate the perception of improved credit quality in 2004 (see Box 10).

Cost control has also been a priority for larger institutions in order to maintain profitability. The average cost-to-income ratio decreased from about 72% in 2002 to about 67% in 2003. Moreover, the degree of dispersion of this ratio between the quartiles continued to decrease up to the first half of 2004 (see Table S9). The main areas of cost-cutting were the rationalisation of branch networks and reductions in the number of staff. For some euro area institutions, it remains to be seen what further scope for cost reduction remains after the extensive cost-cutting measures already adopted.

Chart B9.3 Frequency distribution of Tier 1 capital for large euro area banks



Source: ECB calculations based on annual accounts and interim financial statements.
Note: Data for 2004 H1 are preliminary and are not based on the full sample.

Solvency. The key regulatory solvency ratios improved between 2002 and 2003. The average Tier 1 ratio was 6.4% in 2003, up from 5.6% in 2002. Encouragingly, those banks with the weakest solvency ratios in 2002 managed to move their solvency ratios onto a more solid footing between 2003 and the first half of 2004 (see Chart B9.3). The improved shock absorption capacity of these banks that this implies should contribute positively to financial stability in the euro area.

With regard to developments in the first half of 2004, some signs appeared of improved credit conditions and a pick-up in corporate loan demand. Based on unconsolidated data, the annual rate of growth in lending to non-financial firms accelerated after February 2004, rising from 3.0% to 4.3% by July 2004. The low interest rate environment continued to boost household lending, with the annual growth rate of new loans to households increasing to 8.9% in April 2004. Following the pick-up in loan demand, some initial indications that the declining trend in interest income may be reversing also appeared in the first half of 2004 in a sample of 50 large euro area banks (see Box 9).

Bank lending margins generally fell in the course of 2003 due to the low yield environment (see Chart S38).[3] Deposit margins broadly increased from May to November 2003, counteracting some of the negative pressures on overall margin from reduced lending margins (see Chart S39). However, this was not enough to boost the depressed net interest income in 2003. Overall margins started to show signs of improvement after mid-2004. However, banks' margins are likely to face further pressure, as indicated by a positive funding gap (see Chart 4.4), which forces banks to rely on more expensive market funding.

In addition to loans, other interest-bearing assets also contribute to net interest income. Banks increased their holdings of fixed income

3 Banks' deposit rates cannot become negative, while lending rates generally fall in a low interest environment, thus reducing banks' margins.

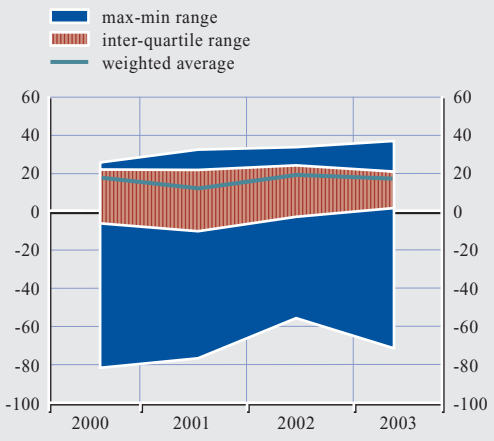
securities in 2003. Holdings of government bonds and other debt securities issued by public bodies increased as a share of total assets in 2003 by 1 percentage point, to 8.3%. In addition, the share of private sector debt securities grew by 0.2 percentage points to 12.2% (see Table S7).

Non-interest sources of income of euro area banks increased in 2003, both as a share of total income and of total assets (see Table S5). The income from trading and foreign exchange operations, as a share of total income, increased. The strengthening of trading income in the euro area can partly be explained by the recovery of stock markets in 2003.

In 2004, preliminary results indicate that non-interest income continued to grow at a fast pace. This was probably boosted by fees and commissions owing to the rebound in consumer credit in the first half of 2004. Consumer credit demand is expected to remain strong according to the October 2004 ECB Bank Lending Survey (see Box 10).

Chart 4.4 Customer funding gap for euro area banks

(2000 – 2003, % of loans to customers)



Source: Banking Supervision Committee (BSC).
Note: The customer funding gap is calculated as the difference between loans to customers and deposits from customers, expressed as a percentage of loans to customers.

Cost efficiency increased in 2003

Efforts to contain costs, which began in 2002, continued in 2003. This contributed to the improvement in the profitability of the euro area banking sector in 2003. Banks were able to improve their cost efficiency as indicated by a reduction in the aggregate cost-to-income ratio (see Table S5). The ratio stood at 64.5% in 2003, 2.4 percentage points lower than in 2002. The general improving trend in cost efficiency was common to most euro area countries, including those with the weakest profitability developments in 2003. In addition, further efforts to contain costs were made in the first half of 2004.

Staff and administrative costs fell significantly as measured against total assets (see Table S5). The aggregate reduction in staff costs was achieved despite the one-off severance payments, which weighed on costs in some banking sectors. On average, banks were able to reduce the number of staff, which contributed to an improvement in efficiency. The closing of branches in some countries represented an additional factor improving effiency.

Provisioning for loan losses decreased marginally in 2003

The flow of loan loss provisions of euro area banks decreased in 2003 compared to 2002, effectively contributing to improved profitability (see Table S5). However, the adequacy of provisioning remains questionable. Remaining weaknesses in the balance sheets of SMEs may have left some residual credit risk, particularly given the sluggishness of domestic demand. It remains unclear whether banks' provisioning has been adequate given the phase of the business cycle in the euro area.

While the flow of provisions decreased, the coverage of non-performing loans by provisioning reserves increased in the euro area as measured against total loans and advances or non-performing and doubtful assets (see Table S6). However, the aggregate figures hide important differences between countries. In some countries, relatively low levels of

Box 10 The Bank Lending Survey

The latest ECB Bank Lending Survey (BLS) of October 2004 shows that the net percentage of banks tightening credit standards to enterprises and households declined further in the third quarter of 2004 (see Chart B10.1). This is the second time since the BLS was started in January 2003 that a net easing in credit standards has been reported, and it continued a downward movement in the net percentage of banks tightening credit standards to enterprises. Among the factors explaining changes in credit standards, competition from other banks and from market financing contributed to the stronger net easing. At the same time, more negative perceptions regarding the industry or firm-specific outlook as well as higher costs related to bank capital positions slightly favoured a tightening in credit standards. Expectations regarding general economic activity remained broadly unchanged. Regarding the terms and conditions of credit, there was a decline in the net percentages of banks tightening credit standards via the size and maturity conditions of the loan as well as via margins on average loans.

According to the previous surveys covering the period from January 2003 to March 2004, the credit standards applied to the approval of loans to enterprises were tightened during the entire period. However, the degree of additional tightening consistently fell from one reporting period to the next. For the third quarter of 2004, banks reported a further slight net easing of credit standards for loans or credit lines to enterprises. This continued a downward movement that started with the first Bank Lending Survey for the last quarter of 2002. In terms of the conditions of credit, the tightening during 2003 and early 2004 was mainly achieved through increased margins on average loans although the contributions of this condition of credit towards tightening declined after the end of 2003.

Overall, preliminary evidence from the BLS indicates that banks tightened their credit standards in the euro area between late 2002 and 2003, mostly reflecting an increase in the perception of

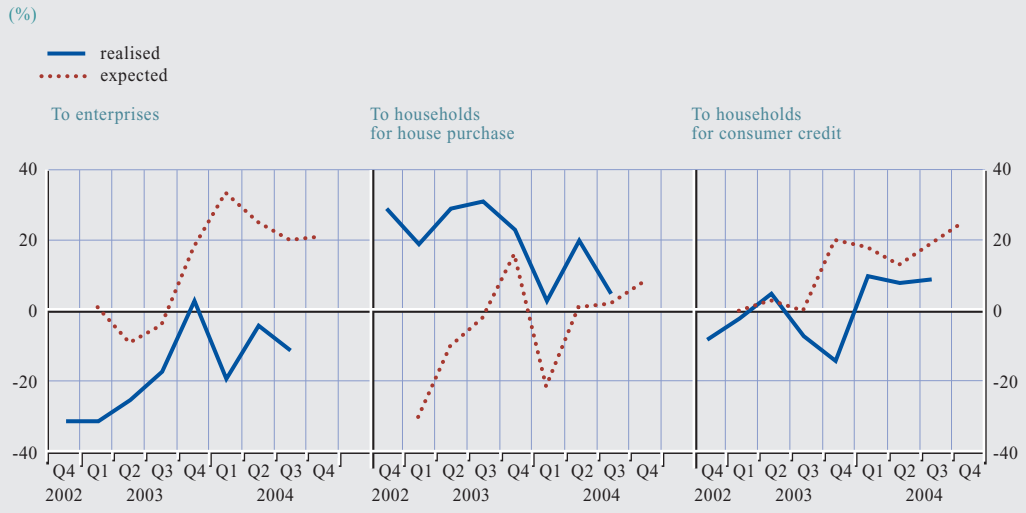
Chart B10.1 Changes in credit standards (net percentages of banks contributing to tightening credit standards)

Source: ECB Bank Lending Survey.

risk. This probably compares with a substantially looser credit regime in the second half of the 1990s, which made the tightening more forceful. However, the percentage of banks tightening credit standards has consistently declined. As in the US, a continuation of this trend would imply an improvement in credit conditions in the near future.

Demand for loans of households has continued to be higher than expected, and this could raise concerns about households' leverage. Net demand for loans for house purchase increased substantially. The increase in housing loan demand has been consistently higher than banks have expected. However, changes in the demand for loans by enterprises continued to be negative and below what banks have expected. A major factor that has contributed to the overall, still negative, changes in net demand is the increased use of internal financing by enterprises.

Chart B10.2 Changes in credit demand



Source: ECB Bank Lending Survey.

provisioning in 2003 meant that the stock of provisions fell considerably. This led some banks to increase provisioning by late-2004.

While the share of non-performing and doubtful loans in total loans and advances decreased only marginally in 2003, it fell as a proportion of own funds owing to faster growth in capital buffers (see Table S6).

In 2003 write-downs on investment portfolios had a strong impact on the profits of some large euro area banking sectors. The increase in write-downs was induced by the need to clean balance sheets from overvaluations of assets. In the remaining countries, loans represent a major share of banks' assets. Consequently asset write-downs had only a minor effect on bank results in these countries.

Capital adequacy broadly improved in 2003

Overall, banks' capital adequacy levels improved in 2003, with the overall solvency and Tier 1 ratios increasing in the euro area (see Table S8). At end-2003, the average Tier 1 ratio stood at 8.7%, up 0.4 percentage points from 2002, while the overall solvency ratio was 11.9%, up 0.5 percentage points from 2002.

The distribution in the overall solvency ratio shifted towards the higher brackets, which further indicates a strengthening of the solvency of euro area banks (see Chart S40). There are signs that these tendencies continued in the first half of 2004.

Euro area banks recorded a small fall in both on-balance sheet risk-weighted assets and their risk-adjusted trading book items between 2002 and 2003, as a percentage of total risk-weighted assets. Of the components of the trading book own funds requirements, only the one for foreign exchange rate risk fell in 2003 (see Table S8).

Liquidity and funding conditions broadly favourable

On banks' assets side, liquidity broadly increased, as indicated by the increase in the broadest liquidity indicator, which includes debt securities issued by public bodies, as well as cash and treasury bills (see Table S7).

Box 11 Net interest income and non-interest income in euro area banks

Banks have continued to broaden their potential sources of income growth, especially in light of declining margins on traditional retail lending. One possible effect of these attempts to diversify income sources might be an increase in the share of non-interest income in banks' total income, which could in turn reduce cyclical variation in banks' overall income. This Box examines whether this has occurred for a sample of 140 large euro area banks by looking at the changes over the period 1999-2003.

One component of non-interest income is fee and commission income, which accounts for the largest share of non-interest income for most institutions. This is the income received by financial institutions for the provision of services not directly related to lending, i.e. it excludes interest received from loans. It does, however, include fees for the arranging of loans and income from payment services. Therefore, a positive relationship between this component and

Chart B11.1 Change in net interest income vs. net commission income

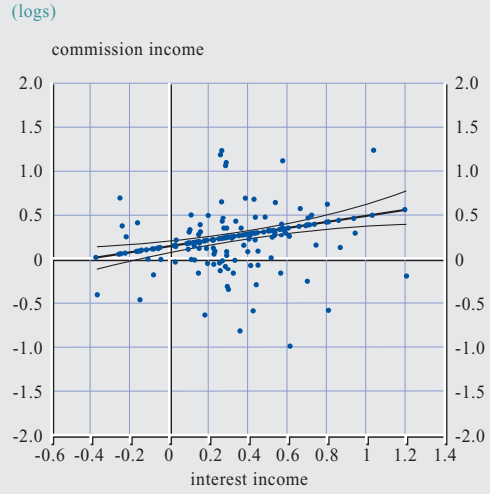
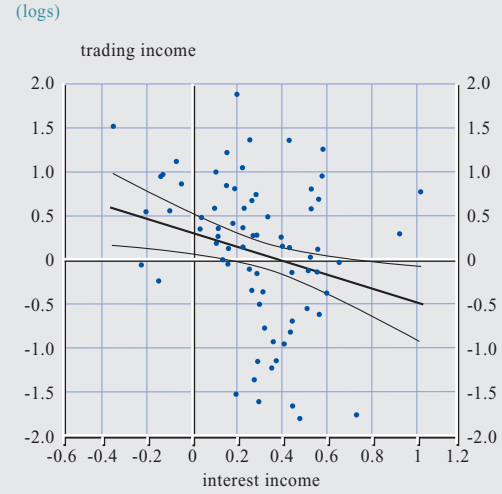


Chart B11.2 Change in net interest income vs. net trading income



Source: ECB calculations based on annual accounts.
Note: The lines in both charts are regression lines fitted on a cross-section of banks using robust regression; the outer lines represent the 95% confidence interval.

interest income could be expected, as both will be driven by the lending cycle.[1] For the sampled euro area banks, this indeed appears to be the case (see Chart B11.1). Therefore, the potential diversification benefit from expanding activities towards sources of fee and commission income would appear to have been rather limited over recent years. Another type of non-interest income for banks is trading income. While the share of trading income in non-interest income is not as important as that of fee and commission income, it has nevertheless become more important for some institutions. There appears to be a weak negative relationship between this source of income and interest income (see Chart B11.2).[2] This could imply that although banks have potentially been incurring more market risk, this may have provided some diversification benefits. However, this may come at the expense of greater volatility for non-interest income as a whole.

Overall, the results suggest that the most important non-interest income sources are positively, though weakly, related to interest income for this sample of banks and time period. This implies that non-interest income may not necessarily be a substitute for interest income in times of slower income growth.

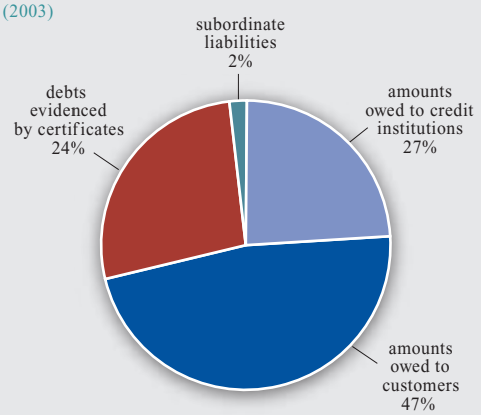
1 Fee income is also generated by the cross selling of products provided by institutions. This may account for the flat slope of the regression line. However, banks do not generally provide such a detailed breakdown in their published accounts to show the importance or otherwise of this source of income.

2 The regressions are estimated using robust regression methods to control for outliers. The results from these regressions are: commission income = α + 0.10 Interest income. The t-statistic on interest income is 3.54 and F(1,202)=12.52[.000]; trading income = α - 0.76 Interest income. The t-statistic on income is 2.72 and F(1,139)=7.41[.007].

On their liabilities side, banks faced some funding challenges in 2003. While customer deposits still represent the largest share of funding (see Chart 4.5), on aggregate the share of deposits in total assets fell slightly in 2003 (see Table S7). The general downward trend in customer deposits over the past few years has forced banks to search for more expensive market funding.

Chart 4.5 Structure of euro area banks' funding

(2003)



Source: Banking Supervision Committee (BSC).

There were again large differences in deposit growth between euro area countries. While deposit growth was sluggish in a number of countries in 2003, some large euro area banking sectors registered an increase in the level of customer deposits. This alleviated some of the pressures on net interest income for these banking sectors as the increasing share of relatively inexpensive deposits positively contribute to interest margins.

4.3 RISKS FACING THE BANKING SECTOR

Although the outlook for the stability of the financial system is viewed as having improved since end-2003, some potential sources of risk and vulnerability remain both within the banking sector as well as outside it. A macro-

prudential analysis must therefore involve a careful assessment of these risks (see Box 12).

Within the banking system, pockets of fragility may remain in some euro area countries where banks' profitability further decreased in 2003 from already low levels. However, signs of improvement in these sectors appeared in the first half of 2004.

Additional fragility for all euro area banks may have been induced by the low returns in fixed-income markets, as they seem to have encouraged greater risk-taking, in particular by banks. To the extent that this search for yield has raised asset prices above their intrinsic values in some corporate or emerging economy debt and other market segments, vulnerabilities to a reappraisal and repricing of risk may be present. Concerns about market and liquidity risk persist despite the relatively smooth adjustment of market prices to increases in US official interest rates. Shocks to banks from market movements could be transmitted via their direct market exposures as well as indirectly through existing interlinkages to other financial institutions via rising income and credit risks (see Box 13).

Persistently wide global imbalances and movements in oil prices continue to pose risks to banks. While these risks would have an impact on banks if they were to affect foreign exchange markets as well as other financial market segments, they may also have a stronger impact indirectly through other economic sectors. The above concerns may be particularly relevant for the SME sector in the euro area. While large euro area companies have benefited from the strength of import demand from the US, Japan and China, this has not been the case for the majority of SMEs. Further deterioration in the condition of SMEs could adversely affect banks' credit quality. Increasing oil prices could also have negative implications for banks, indirectly through the corporate sector as well as through the most highly income-geared households in the euro area. In addition, household disposable income is heavily dependent on positive macroeconomic developments. Furthermore, in countries where

Box 12 A framework for macro-prudential analysis

Financial stability is an important economic policy objective.[1] Financial stability analysis requires a broad view on the economic environment. It draws upon a large pool of data in order to measure the condition of the macroeconomy and its sub-sectors, and it links this with information on the functioning of financial markets and the financial condition of key financial intermediaries. A comprehensive framework is especially necessary as the weight attributed to different sources of financial instability changes and new sources may appear over time.

Macro-prudential analysis is an integral part of the broader framework of financial stability analysis.[2] Owing to the importance of banks in financial intermediation as well as the special role they play in the economy, a large share of the data and tools developed for financial stability analysis aims at measuring the ability of the banking system to withstand shocks.

The origin of the macro-prudential analysis frameworks lies in the series of costly banking crises in the 1980s and 1990s which revealed the need to augment existing micro-prudential frameworks by analysing the conditions and risk absorption capacity of the banking system. The term "macro-prudential" was developed to distinguish this new approach from the assessment of individual institutions. The purpose of macro-prudential analysis is to assess the stability of

1 See Schinasi, G.J. (2004), *"Private Finance and Public Policy"*, IMF Working Paper 04/120.
2 See Houben, A. , J. Kakes and G.J. Schinasi (2004), *"Towards a framework for financial stability"*, De Nederlandsche Bank Occasional Studies, Vol.2 (1).

the financial system as a whole and to describe the threats to it that could result from common shocks that affect either many or all financial institutions at the same time, or from shocks that could spread from one institution to another.

The need to set up a formalised macro-prudential framework is reflected in the increasing work in this field undertaken by several international institutions. As a general feature, most frameworks aim at identifying potential indicators that should be monitored on a regular basis.

Macro-prudential analysis of the ESCB

The European System of Central Banks (ESCB) has been carrying out a macro-prudential analysis on a regular basis since 2000.[3] The analytical framework has been reflected in the statistical production of macro-prudential indicators. The set of macro-prudential indicators consists of data that gauge macroeconomic developments and forecasts, the financial conditions of households and firms, the conditions of other financial institutions, general financial market developments and the current financial condition of the banking sector. In addition, it includes a number of forward-looking indicators. These indicators aim at capturing the expected outlook for the key institutions over short to medium-term horizons using high-frequency market data. One example of such an indicator is the distance-to-default of the banking sector.

In the ESCB framework, indicators that measure actual and/or potential sources of risk are identified. These risks could stem from real economic developments such as deteriorating balance sheet conditions of households or non-financial firms. Sources of risk can also materialise through turbulent conditions in financial markets, triggered by, for instance, the failure of a major counterparty, or owing to fragilities in financial system infrastructures. After assessing the possible external macroeconomic sources of risk or financial market-related fragilities, the current condition of the banking system is assessed using backward-looking indicators – usually based on income statements and balance sheets – in order to gauge the ability of the sector to absorb disturbances. The aim of this exercise is also to capture possible internal fragilities in the sector such as inadequate provisioning, low capital buffers or otherwise insufficient risk management.

Next, the likelihood of instability in the banking sector is assessed by identifying the likely transmission channels of possible shocks to the banking system through banks' exposures to credit, interest rate, foreign exchange and other market risks. In addition, contagion risk is assessed, as there can be a risk that a liquidity crisis in one financial market segment can spread to another, thereby threatening the stability of the financial system. To take into account the fact that some plausible shocks may have a low probability of striking the financial system but would entail a high cost if they were to do so, stress testing of the impact of some plausible events on the banking sector may also be performed. Finally, banking systems' ability to withstand these shocks is assessed by estimating the expected size of the losses generated under a shock and comparing these to existing buffers in the system. Analysis of forward-looking market indicators can complement these assessments.

3 See Mörttinen, L. , P. Poloni, P. Sandars and J. Vesala, *"The analysis of banking sector health using macro-prudential indicators"*, ECB Occasional Papers, forthcoming.

IMF Financial Soundness Indicators

The IMF has set up a framework for macro-prudential analysis to analyse the soundness of the financial system.[4] As a part of this, a set of Financial Soundness Indicators has been identified for periodic monitoring to serve as a tool for enhancing crisis prevention. The set consists of a core set and an encouraged set of indicators. The core set of indicators focuses on generally available indicators relating to banks, whereas the encouraged set primarily focuses on conditions in the non-bank financial sector, the corporate and household sectors, and real estate markets. Most of the indicators identified by the IMF match the macro-prudential indicators set up by the ESCB. The IMF indicators focus on capturing the shock-absorbing buffers in the banking sector on the basis of, among other aspects, banks' capital adequacy.

4 See V. Sundararajan et al. (2002), *"Financial soundness indicators: analytical aspects and country practices"*, IMF Occasional Paper 212.

house prices have risen rapidly, a reversal of this trend could pose problems for households through reduced wealth and collateral values. This could affect banks, particularly in those countries where house price increases have been followed by increasing loan-to-collateral value ratios. Although declines in residential property prices are not widely expected in the euro area, downside risks to house price inflation may have increased in some countries.

Links between euro area banks and the banking systems in the other EU25 countries are of particular importance in the case of the NMSs, where many domestic banks are owned by foreign, mostly euro area banks. While ownership links between euro area and non-euro area EU15 countries are less prominent, other forms of interbank linkages between euro and non-euro area EU15 banks are discussed in Box 13.

CREDIT RISK EXPOSURES

Household credit risk has remained contained

In an environment of relatively slow economic growth and subdued lending growth to non-financial firms, banks continued to lend to households at a rapid pace.[4] The importance of the risks stemming from household lending for the stability of the banking sector depends upon actual exposures, the interest rate sensitivity of household loan portfolios as well as collateral values and other credit standards.

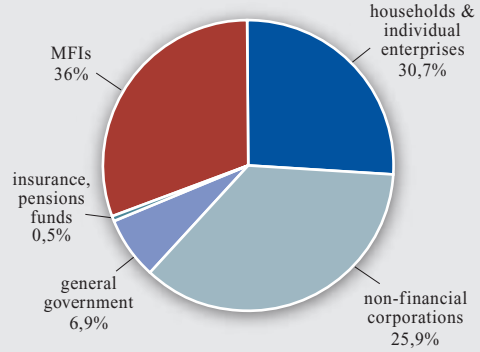
Household lending in the euro area represents over 30% of the loan portfolio of banks, according to non-consolidated data (see Chart 4.6). Its growth was a major contributing factor to banks' loan growth after 1999. However, this did not lead to a notable change in the composition of banks' loan portfolios away from other sectors, including non-financial firms. It cannot be ruled out that the aggregate data may mask some important differences within the euro area.

The household loan portfolio consists of lending for house purchase, consumer credit

4 See the Special Feature *"Aggregate Household Indebtedness in the EU: Financial Stability Implications"*.

Chart 4.6 Structure of euro area banks' aggregate non-consolidated lending books

(June 2004)



Source: ECB.

and other loans. The share of mortgage lending in total lending to households is large. The impact of changes in interest rates on banks from their exposures to households depends on the direction of the interest rate change. Both credit quality and demand are sensitive to rising interest rates. The sensitivity of credit quality is largely determined by the effect of increasing interest rates on the repayment burden. While risks of rising interest rates were in late 2004

Box 13 Interbank linkages in the euro area

Shocks can be quickly transmitted within the banking system through the interbank market. This is why financial stability analysis requires regular monitoring of interbank linkages. For this purpose, non-consolidated data on interbank assets and liabilities of euro area banks aggregated at a country level can provide useful information. It is important to note that mapping of interbank relationships is not sufficient to measure contagion risk in interbank markets, as proper measurement of contagion requires detailed consolidated data on each bank's interbank exposures, also taking into account the different risk mitigation measures (such as collateralisation, netting, hedging, etc.).

Risks faced by banks in their interbank positions are different in the case of assets and liabilities. Interbank asset positions create a channel for contagion through credit risk. Interbank liability positions expose banks to funding risk. With the creation of an integrated money market in euros, the importance of funding risk may have declined. Access to a large pool of interbank lenders reduces the risk of a loss of liquidity for sound institutions in the case of the withdrawal of any specific creditor bank. Instead of liquidity exposures to a specific bank or country, only systematic aggregate liquidity shortages at the euro market level may, at times, remain a source of concern.

Notwithstanding data limitations,[1] some patterns in the activities of euro area banks in the interbank market can be identified. In particular, the domestic share of each country's total interbank positions remains larger than the cross-border one, although the average result may hide country differences. There are in general indications that larger countries rely more heavily on their domestic interbank market than smaller ones (see Table B13.1).

Some patterns also emerge from the evolution of the euro area interbank market since the launch of the euro. The average domestic share of interbank assets has declined (see Table B13.1). This suggests that banks have substituted domestic for cross-border interbank credit risk, which implies an increase in cross-border creditor exposures. Developments on the liability side have been somewhat different: although the average domestic share of the interbank market fell considerably between 1998 and 2001, it increased slightly again between 2001 and 2004 (see Table B13.1). Herfindahl indices[2] can be used to gauge changes in the concentration of the cross-border interbank market in the euro area. Weighted averages show a slight increasing trend in concentration between 1998 and 2004 (see Table B13.1).

1 The data collected by the ECB enable the identification of non-consolidated exposures of the national banking systems vis-à-vis each other. The major limitation of these data is that they include interbank transactions between subsidiaries, branches and parents located in different centres, as large exposures in non-consolidated data can often be explained by transactions between parents and branches. These data also suffer from the exclusion of potential second-round effects.

2 The Herfindahl index for country i is the sum of the squared shares of all other countries in the cross-border volume of interbank assets/liabilities of country i, excluding the rest of the world. The corresponding index for the euro area countries is a weighted average of the country indices. Weights are assigned according to the share of each country's cross-border assets/liabilities in euro area cross-border asset/liabilities.

Table B13.1 Major features of the euro area interbank market

	Assets			Liabilities		
	1998	2001	2004	1998	2001	2004
Domestic share of each country's total interbank assets and liabilities (weighted averages)	60	58.6	55.8	588.7	51.7	52.8
Herfindahl index of countries' share of cross-border interbank positions (weighted averages)	23.2	22.3	24.7	23.4	27.1	25.2

Source: ECB.

In terms of developments vis-à-vis other geographical areas, Table B13.2 shows the aggregate trends. There is a clear increase in the share of the euro area and non-euro area EU15 countries in total interbank assets over the period 1998-2004, whereas the share of the rest of the world has been decreasing. The largest relative increase has taken place in the share of the non-euro area EU15 countries. Given the location of London in this region, and its role as a major financial centre, this development can be explained on two grounds. First, UK banks have become major intermediaries in the euro market in London, supported by London's position as the largest euro market centre. Second, as data are on an unconsolidated basis, the increase in the UK share also covers a flow of funds towards subsidiaries of euro area banks from their parent banks in the euro area.

Table B13.2 Aggregate interbank cross-border assets of euro area creditor countries vis-à-vis borrowers in other euro area countries, non-euro area EU-15 countries and the rest of the world (RoW)

(percentages of unconsolidated euro area aggregate cross-border interbank assets)

	euro area	non-euro EU-15	RoW
1998	40.9	26.8	32.3
2001	46.7	29.4	23.7
2004	47.2	32.9	19.9

Source: ECB.

Overall, the ECB's data indicate a significant increase in cross-border linkages from the euro area banks to the EU15 countries, whereas the share of domestic banks in interbank assets has continued to decrease between 1998 and 2004. This is potentially a mitigating factor with regard to the interbank transmission of risk, as more diversified links between institutions can be considered to enhance stability. On the other hand, concentration within the EU15 may have increased, as indicated by the reduced role of banks outside the EU15 and the greater importance of EU15 financial centres. This puts increased emphasis on the financial condition of key institutions in these centres. Owing to the importance of interbank markets as a transmission channel, they warrant continued monitoring not only with regard to the evolution of assets and liabilities, but also the condition of counterparties involved and the risk mitigation measures used.

considered to be a source of vulnerability for banks, decreasing interest rates can also pose risks for banks. This could take place through prepayment of loans, i.e. by households refinancing their loans in order to benefit from lower interest rates. However mortgage prepayment risk in the euro area is estimated to be low (see Box 14).

In assessing the repayment burden from rising interest rates, the share of fixed and variable rate mortgages is an important factor. The larger the share of variable rate loans, the more likely it is that increasing interest rates will burden households directly through increased debt servicing costs. On the other hand, in countries where banks grant most housing loans at fixed

rates household credit risks might be contained. The share of outstanding mortgage debt that could be exposed in the short run to a change in interest rates in the euro area was estimated at around one-third of the total stock in the euro area in the second quarter of 2004 (see Box 6). However, there are wide differences across countries. Heavily-indebted households would be most vulnerable to an upturn in interest rates; however, according to the limited information available, these borrowers appear to constitute only a small proportion of banks' loan books in the euro area. This would seem to indicate that any impact from increasing interest rates would to a large extent be carried by banks rather than households. While interest rate risks are likely to be contained in the case of banks via hedging, the banking industry may remain vulnerable, in the short run, to a decline in business volumes if household credit demand were to decline.

A further important factor in determining the credit risk from household sector loan portfolios is the way in which credit standards are set in granting loans. If risk premia and loan to value ratios (LTVs) on mortgages are adequate, then banks should be well insulated against the risk of rising defaults, although the ability of banks to realise collateral varies greatly across countries. LTVs increased slightly in several countries in 2003. There is also some evidence for individual countries that some borrowers have LTVs ranging between 90% and 100%. However, as a proportion of the overall stock of lending for house purchase, these only represent a small number.

With regard to consumer credit exposures, while there were substantial increases in unsecured credit outstanding in some countries, the stock of consumer loans and other credit as a proportion of total household loans remained rather small.

Evidence from a number of countries suggests that payment arrears on consumer credit are higher than they are on mortgage debt as households with stretched balance sheets tend to default on consumer credit first. Consequently it is important that margins on consumer credit reflect their higher probability of default. Banks have been making efforts to price consumer credit risk more efficiently. For instance, the use of credit scoring models by banks or their consumer finance company subsidiaries has become widespread.

To conclude, while the larger share of floating-rate loans, lowered margins and increased LTV ratios on new lending for house purchase may be indicative of heightened credit risk going forward (as loan losses start to add up usually two to three years after the signing of the loan agreement), the overall household loan portfolio is only assessed to pose a risk of significant losses for banks in the unlikely occurance of simultaneously rising unemployment, falling house prices and rising interest rates.

Credit risk in non-financial firm portfolios is higher for SMEs

Developments in the credit quality of banks' corporate loan portfolios have been mixed. While there are positive indications that in 2003 and the first half of 2004 the balance sheets of large euro area companies moved onto a more solid footing – mainly thanks to the strength of external demand – the SME sector continued to be faced with sluggish domestic demand. Against this background, insolvencies in the euro area continued to rise in 2004.

With regard to direct channels between SMEs and banks, there are some indications that these exposures are substantial in certain banking sectors. However, it is important to note that banks' links to the SME sector go beyond those of direct exposures. The SME sector accounts for a large share of employment in the economy. Hence, financial strains in this corporate sub-sector can pose risks for banks insofar as this is passed through to household credit risks, for instance due to labour shedding.

Banks' pricing of loans to SMEs should reflect the less positive aggregate condition of the sector. Using the size of a loan as a proxy for the size of the company there seems to be a

Box 14 The distribution and management of prepayment risk in European mortgage markets

Prepayment risk is a risk that banks can face if they grant homeowners the option to take advantage of lower mortgage interest rates by refinancing their mortgages on more favourable terms. This Box examines the prevalence of prepayment risk in the European mortgage markets, and examines how such risks are typically managed.

Mortgages with a prepayment option are commonplace in the US, and prepayment activity has tended to be highly sensitive to long-term interest rate changes. For instance, between mid-2002 and mid-2003, when US mortgage interest rates reached the lowest levels seen in more than 40 years, homeowners made substantial prepayments on their mortgages. In total, almost half of the total outstanding mortgage debt in the US was refinanced at lower rates.[1] The handling of these prepayments – mainly by the two (systemically important) US mortgage agencies Fannie Mae and Freddie Mac – had important consequences for the functioning of the financial market. This is because prepayment risk is typically hedged in fixed income and swap markets. As this hedging is often imperfect, unexpected bouts of mortgage prepayments can create volatility in bond markets, as institutions must adapt their hedges swiftly.[2]

The prevalence and handling of prepayment risk differs in two respects between Europe and the US. First, while in the US prepayment costs may be priced into the interest rate, in many European countries lump-sum prepayment penalties are induced by statutory requirements. Often banks impose charges on homeowners for early repayment. These fees force households to bear part of the prepayment risk and, if the fees are sufficiently high, may deter homeowners from prepayment, thereby nullifying the prepayment risk faced by banks. An exception to this is the Danish mortgage market, where long-term fixed-rate mortgage loans with an embedded option of a penalty-free prepayment are typically offered, as in the US.[3]

A second source of difference between the US and European mortgage markets is the way banks fund their mortgage loans, because an adequate funding instrument could allow the mortgage bank to pass on the (residual) prepayment risk to investors. In Europe, the bulk of the funding of mortgages is still provided by retail deposits and other retail instruments (in total around 75% of overall funding), rather than through funding sources that allow the transfer of the risk, such as mortgage-backed securities. Hence, in Europe, the (residual) prepayment risk lies mostly with the banks. However, the share of market funding has been rising, as housing and capital markets are becoming increasingly intertwined through mortgage (covered) bonds and mortgage-backed securities.

Mortgage (covered) bonds are debt securities that are secured ("covered") by a pool of mortgage loans. They are not ordinarily linked to specific mortgage loans. The pool of mortgage loans stays on the balance sheet of the respective mortgage bank ("on-balance sheet securitisation"). Still, in particular in the case of longer-term fixed-rate mortgages, the general interest rate risk faced by banks is relatively lower in the case of funding through mortgage bonds compared to retail deposits, owing to the better duration match between assets and liabilities. By late 2004, nearly 20% of the outstanding mortgage loans in the EU were funded through mortgage bonds,

1 See Federal Reserve Board (2004), *"Testimony of Chairman Alan Greenspan"*, the Federal Reserve Board's semi-annual Monetary Policy Report to Congress before the Committee on Banking, Housing, and Urban Affairs, US Senate, 20 July.
2 See IMF, *"Global Financial Stability Reports"*, September 2003 and March 2004.
3 See BIS (2004), *"The Danish Mortgage Market"*, BIS Quarterly Review, pp. 95-109, March. In fact, the Danish and the US mortgage markets are globally exceptional as regards the characteristics of the embedded option of a penalty-free prepayment.

with the relative importance varying between countries. Mortgage bond funding is of relatively higher importance in Germany, Sweden and Austria.

By contrast to mortgage bonds, mortgage-backed securities – involving the securitisation of specific mortgage loans which are removed from the balance sheet of the originating institution ("off-balance sheet securitisation") – transfer the prepayment risk from the originating mortgage bank to the holder of the mortgage-backed security, as in the US. Around 5% of the outstanding mortgage loans in the EU are funded through mortgage-backed securities. This type of funding is relatively more significant in the UK, Spain, Italy and Ireland. Finally, in the Danish mortgage market, funding takes place almost fully via so-called callable bonds, which are pass-through securities where the mortgage banks do not retain any prepayment risk but pass it on to investors, as in the case of mortgage-backed securities.

Prepayment risk in Europe is much less concentrated than in the US. It is nevertheless difficult to manage because borrowers do not always pursue rational option exercise strategies, even though the possibility of prepayment constitutes an 'option'.[4] This means that a precondition for sufficient hedging is adequate modelling of prepayment risk. Models that predict patterns of prepayment can be estimated from historical prepayment rates. This information can be used to calculate option-adjusted key figures so as to correctly price the prepayment risk, i.e. the option's value. Such modelling is conducted by mortgage banks and investors in the Danish market, and is facilitated by the fact that Danish mortgage banks share information on mortgages and prepayment statistics. Such information may not however be collected on a consistent basis in other European countries, and even less so on a pan-European level.[5] In the US, banks and investors also make use of models to forecast prepayment risk.

Turning to the instruments that are used in practice to hedge mortgage prepayment risk, many participants, instead of hedging the prepayment optionality with options on interest rate swaps (swaptions), use swaps-based dynamic hedging to mimic an option synthetically. Despite the dangers associated with such replication – including the risks that derive from imperfect hedging – the still widespread use of plain vanilla swaps as hedges might be explained by several factors. Familiarity with using swaps may be one explanation; another reason might be that the purchase of an option requires the outlay of cash upfront.[6] While sophisticated risk managers tend to prefer the use of options, liquid option markets to hedge prepayment risk do not yet exist in all European mortgage markets.

A study undertaken by the European Mortgage Federation in 2003[7] examined the mortgage markets in selected European countries which were deemed to be representative of the European context. It was found that in Germany, prepayment risk is fully borne by homeowners, so that mortgage banks in Germany are not exposed to this risk. Owing to either regulation or consumer pressure, early repayment fees are capped in Spain, France, Italy, the Netherlands, Portugal and

4 Homeowners do not necessarily exercise rational strategies in view of changes in interest rates (so-called optimal prepayments), and demographic events which involve house sales (e.g. job relocation) may also generate prepayments (so-called sub-optimal prepayments). On the two types of prepayment, see Federal Resere Bank of San Francisco (1998), *"Mortgage Interest Rates, Valuation, and Prepayment Risk"*, Economic Letter, 9 October.

5 See for example respective statements on the UK market in Risk Magazine (2004), *"Short Shrift for Long-term Mortgages"*, Vol. 17, No 6, June.

6 See Risk Magazine (2003), *"How to Survive a Mortgage Meltdown"*, Vol. 16, No 12, December.

7 At the request of the European Mortgage Federation, Mercer Oliver Wyman produced a *"Study on the Financial Integration of European Mortgage Markets"* in October 2003.

the UK, implying that the originating mortgage banks in these countries must, at least as a first step, take the (residual) prepayment risk that is not covered by the (capped) fee. In Denmark, investors bear the prepayment risk.

To conclude, given widespread mortgage prepayment penalty fees and the fact that the bulk of the funding of mortgages is provided by retail deposits, mortgage prepayment risk in Europe is mainly faced by the originating banks as well as homeowners, while relatively little spills over to capital markets. Furthermore, prepayment risk is much less concentrated than in the US. Hence, compared to the US, European fixed income markets tend to be less subject to bouts of turbulence stemming from mortgage refinancing.

divergence in the pricing of risk by banks.[5] Margins on loans below EUR 1 million remained above those of loans over EUR 1 million in 2003 and 2004 (see Chart 4.7).[6] Furthermore, the gap between the two steadily increased during this period. On the other hand, there are indications that the same factors have affected the pricing of large loans and corporate bonds

With regard to bank exposures to aggregate industries, data were collected for seven euro area countries. Sectors are classified according to the following breakdown: basic materials and construction, consumer cyclicals and non-cyclicals, capital goods, energy and utilities, financial, and technology and telecommunications. The risk entailed in banks' positions towards these sectors can be gauged by using the standard expected probability of default of a sector (EDF) in one year's time. Multiplying the mean EDF by banks' exposure produces the exposure at risk for these banks. For this exercise, euro area mean EDFs were used. The associated mean EDF for all sectors decreased from May 2003 to June 2004 following the perceived general improvement in the economic outlook for the euro area (see Table S11). In addition, exposures had decreased for nearly all sectors. Consequently, exposures at risk were reduced quite significantly across the board, indicating an improvement in credit risk concerning these aggregate sectors.

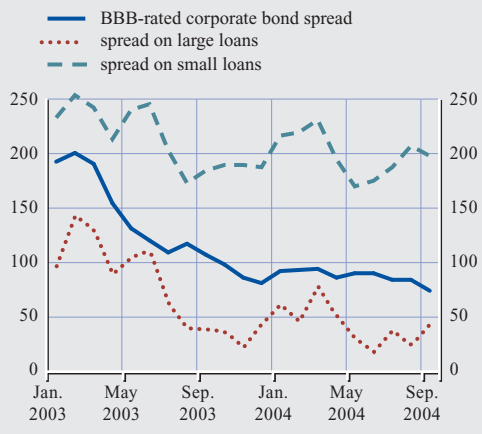
Turning to specific sub-sectors, euro area authorities indicated that exposures of banks to the real estate and/or construction industries were sizeable in many countries in 2003. The financial conditions of these industries tend to be highly sensitive to business cycle conditions, particularly in those countries where excess capacity was built up or where real estate prices had started to fall.

Commercial property price developments varied across euro area countries in 2003. For

5 In some countries, however, such a divergence in the pricing of risk was not registered, as banks tended to substantially lower their margins even towards SMEs due to strong competition among credit institutions.
6 With original maturity between 1 and 5 years.

Chart 4.7 Euro area corporate bond and bank loan spreads

(Jan. 2003 – Sep. 2004, basis points)



Source: ECB and Thomson Financial Datastream.
Note: Spread between rate on loans to non-financial corporations with one up to five years' initial rate fixation below (small) and above (large) one EUR million and the three year government bond yield.

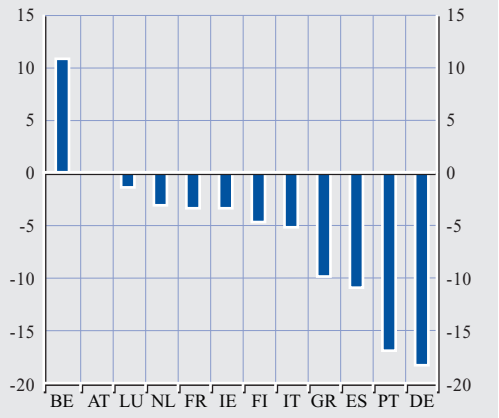
example, in the office space sector, year-on-year price declines were quite common across some major cities (see Chart 4.8). This reflected a mixture of high vacancy rates and lower rents on newly signed contracts. The decline in asset values may make it more difficult for property companies to service their debts. However, this risk will be offset to some extent if the expected improvement in economic growth materialises.

In 2004, the assessment of construction and real estate industries may have improved somewhat. For instance, there were some initial signs of improving rents and vacancy rates in the first half of 2004 for some major cities. By the second half of 2004, there were no signs that significant problems had arisen in these sectors.

The risks that were present in the telecommunications and computer services industries seem to have faded somewhat. However, banks' exposures to these sectors have in general been limited and were reported to have continued to decrease in the euro area from May 2003 to June 2004.

Chart 4.8 Annual office price changes in the euro area

(2002 – 2003, %)



Sources: Jones Lang LaSalle, FPD Savills and ECB calculations.
Note: Calculations are based on changes in capital values for offices in major cities. Austria recorded no change over the period.

INTEREST RATE RISK EXPOSURES

As discussed in other parts of this Review, although not priced into market yield curves, the pricing of long-term interest rate options does not exclude the possibility of a sizeable increase in global long-term interest rates. Banks monitor their exposure to interest rate changes very carefully: large institutions frequently run stress tests which include the event of changes in interest rates.[7] For instance, a common stress test is to assess the impact on banks' balance sheets of an upturn in long-term interest rates of the magnitude seen in 1994 (when yields on US ten-year bonds increased from 5.8% in January to 8.1% in November).

Banks could be affected by changes in interest rates in several ways. In their banking books, banks could be exposed to repricing effects on their assets and liabilities.[8] They would also be exposed to valuation risk on their investment and trading portfolio. Furthermore, banks could also be exposed to the risk of an adverse impact of interest rate changes on the credit quality and the ability of customers to service debt, on the demand for credit as well as basis risk[9] and optionality, such as prepayment, within banking books, or off-balance sheet items.

While there is some evidence that banks have increased their fixed income instrument holdings, measuring valuation risk in banks' banking books would require detailed information on the remaining maturities as well as purchasing prices. This information is not currently available on aggregate.

To assess valuation risks in banks' fixed income trading portfolios, information on value-at-risk

7 See the Committee on the Global Financial System (2001), *"A Survey of Stress Tests and Current Practice at Major Financial Institutions"*, April.
8 Repricing risk is the risk that banks' interest expenses will increase by more than interest receivables when interest rates change. Its motivation lies in the maturity mismatches between assets and liabilities.
9 Basis risk arises from imperfect correlation in the adjustment of the rates earned and paid on different instruments with otherwise similar repricing characteristics.

(VaR) indicators was collected (see Table S10).[10] These indicators were made available by a smaller set of countries, as not all national authorities collect them; for this reason, the results should be interpreted with caution as they may not be representative of developments in the full set of euro area banking sectors. Moreover, VaRs can only offer a partial assessment of the full interest rate risk, and are in general compounded with stress tests analysis to cover more extreme swings in interest rates.

The interest rate VaR usually counts for the largest part of the total VaR. Notwithstanding significant differences across countries, these market risk yardsticks had increased by mid-2004 when compared with a year before. Given the low level of volatility prevailing in the summer of 2004, the increase in the level of VaR readings suggests that the underlying risk positions had increased even more rapidly. Nonetheless, the VaR indicators comprise only a small proportion of bank Tier 1 equity capital.

FOREIGN EXCHANGE RISK EXPOSURES HAVE DECREASED

In analysing the possible impact of foreign exchange risk on the euro area banking sector, a distinction should be made between direct and indirect effects. Direct effects can be defined as those that have a direct impact on banking groups' balance sheets and profitability, while indirect effects are those that have an impact on the balance sheets and cash flows of banks' clients. At the banking group level, direct foreign exchange risks can arise via two different channels: currency mismatches – either in asset and liability positions or in respective income and cost streams – and the translation effect, i.e. the conversion of profits denominated in a specific currency to the banking group's accounting currency. Indirect effects can arise from mismatches in clients' asset/liability positions and income/cost streams, or from adverse effects arising from subdued economic activity, particularly in the traded sector of the economy.

Direct effects could materialise via banks' trading exposures. However, these seem to have declined in 2003 if measured using own funds requirements for foreign exchange risk. The share of these exposures in own funds requirements declined in 2003 when compared with the level in 2002 (see Table S8).

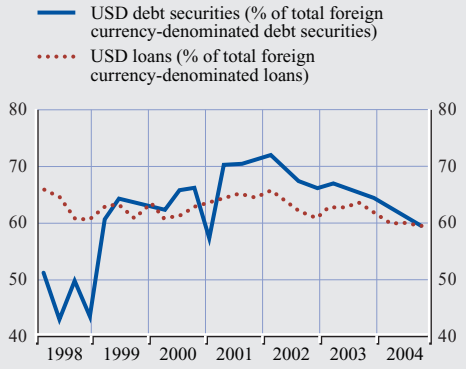
Banks have decreased their holdings of US dollar-denominated assets since December 2001, while reducing liabilities in the same currency at a more contained pace (see Chart 4.9). In this light, banks seem to have positioned themselves to benefit from a potential appreciation of the euro, so that in this respect foreign exchange risk looks subdued.[11] All other balance sheet items denominated in foreign currency have remained broadly constant and at a low level, with very minor changes in the major currency composition of the foreign currency denomination.

10 VaR is a statistical measure of potential losses over a given holding period. The measure consists of a benchmark loss amount and an accompanying probability estimate. On the basis of a historical distribution of returns, a confidence interval is constructed in which losses in excess of the benchmark loss amount are estimated to occur with a specified likelihood. For instance, for a 99th percentile VaR, losses in excess of the benchmark loss would be expected to occur 1% of the time.

11 On both the assets and liabilities side of MFIs, amounts denominated in US dollars always account for over half of total foreign currency-denominated positions.

Chart 4.9 Euro area banks' foreign currency-denominated assets, selected balance sheet items

(Q1 1998 – Q2 2004, %)



Source: ECB.

EQUITY RISK EXPOSURES INCREASED MODERATELY

The strength of the stock markets in 2003 slightly increased euro area banks' income from market activities in 2003 when compared with 2002 (see Table S5). So far in 2004, stock markets have generally moved sideways. This lack of direction in the market, coupled with low volatility, may have discouraged trading activity by banks in 2004. However, equity VaR readings increased between June 2003 and June 2004, with very few exceptions.[12]

BANK EXPOSURES TOWARDS HEDGE FUNDS

Banks' direct exposures towards hedge funds are most likely to arise from their prime brokerage relationships. Direct credit exposures include loans, credit lines and trading exposures in OTC markets (including credit risk (see Box 15)), derivatives markets and others. The recent, relatively mediocre investment performance of hedge funds could signal that direct credit risks have become more relevant. The CSFB/Tremont Hedge Fund Index recorded an increase of only 5.1% year-to-date return in October 2004, with three months in 2004 posting negative returns, while there were no negative returns months in 2003, and the CSFB/Tremont Hedge Fund Index increased by 15.4% in the same year.

For some euro area banks, the income stream from prime brokerage services constitutes a very significant share of total trading and commission income, ranging between 25% and 40%. Increasingly banks are also investing in or setting up hedge funds.

Prime brokerage is a rather concentrated industry and it is primarily dominated by US entities, although certain euro area banks are also among the established players. However, it is becoming more competitive as new banks enter the market. As hedge funds may use the services of several different prime brokers it is possible that a single bank lacks sufficient information on the full risk profile of its customer. In addition, the prime brokerage industry may become less resilient as a number of new entrants aggressively try to gain market share, which could also allow hedge funds to negotiate better access to credit.

Indirect risks may also materialise, for example, through credit risk on counterparties that have large exposures to hedge funds. In addition, since hedge funds are active traders in financial markets, banks' trading book positions could be exposed to market volatility potentially caused by hedge funds realigning their positions. Banks also face indirect risks on the income side; as hedge funds proliferate, banks risk losing asset management income.

EMERGING MARKET EXPOSURES INCREASED

Conditions in emerging market economies have been improving, as discussed at the beginning of this Review. However, risks continue to stem from the potential vulnerability of these economies to an upturn in global interest rates and from the possibility of a disorderly correction of global imbalances. In addition, in non-oil exporting emerging economies, the sharp upturn in oil prices may heighten inflationary pressures. With emerging market economies' debt ratios still relatively high, a sudden increase in risk aversion or a change in market participants' expectations with regard to the pace of interest rate changes in industrialised countries may negatively affect emerging market stability.

There was a general increase in banks' lending to emerging markets in 2003 and the first quarter of 2004 (see Table S4).[13] According to BIS statistics, overall lending to emerging markets increased significantly after early 2003. In particular, the holding of securities, mostly bonds, by BIS reporting banks saw relatively rapid growth (see Chart S6). However, it remains unclear whether this could be ascribed

12 Information on VaRs was collected from public reports of six major euro area banks. Although the developments in these VaRs are broadly in line with the ones of those collected by the BSC (see Table S10), the publicly available VaRs offer a further breakdown of VaRs into equity, interest rate and commodity.

13 These data may be affected by foreign exchange movements, as all figures are converted into US dollars.

to an ongoing search for yield by international investors.

Concerning individual regions of the world, euro area banks in most countries remain relatively heavily exposed to Latin America, and exposure to the main economies there with the exception of Argentina increased in the course of 2003 (see Chart S41). In the case of Argentina, this development can most likely be explained by the uncertainty associated with the ongoing renegotiation of its foreign debt. On the other hand, strong economic performance in Brazil explains the increased exposure by euro area banks.

While the exposures of some euro area banks to emerging Asia remain somewhat lower than those to Latin America, exposures to emerging Asia also increased vis-à-vis all countries in the region from Q1 2003 to Q1 2004 (see Chart S42).

While on aggregate exposures of euro area banks to emerging market economies represent a small share of these banks' own funds, euro area banks with heavy exposures to these economies might be affected by negative external developments.

SOURCES OF RISK IN BANKS' EXPOSURES TO NEW MEMBER STATES

Foreign ownership is high in the NMSs, and is dominated by euro area banks. On average, 71% of total assets of NMSs banks are controlled by foreign investors. Thus, equity investments made in the NMSs may give rise to another risk transmission channel for euro area countries.[14]

Exposures of euro area banks to the NMSs may arise on account of links between the two banking systems. Cross-border lending by euro area banks to the NMSs has gained importance, increasing by 38% between 2002 and 2003. Loan exposures to the NMSs, however, still have only limited relevance for euro area banks' global exposures, comprising 3% of total foreign claims and 5% of claims on EU25 countries.

Cross-border exposures of euro area banks to the NMSs are highly concentrated by both creditor and borrower countries. As at Q4 2003, three euro area countries accounted for more than two-thirds of cross-border lending from the euro area to the NMSs. On the borrowers' side, the three largest central and eastern European countries comprised 78% of total claims on the NMSs.

Looking at the relative importance of the NMSs in foreign exposures by country, at the end of 2003 the proportion of cross-border loans to the NMSs reached at least 10% of total claims on EU25 countries in three countries.

14 For a more detailed analysis of the conditions in NMS banks, see the two BSC reports entitled *"Report on EU Banking Structures"*, 2004 and *"EU Banking Sector Stability"*, 2004.

Box 15 Credit derivatives markets continue to grow rapidly

The growth of credit derivatives markets over recent years has captured much attention. However, it is useful to recall that credit risk has been shared and transferred between counterparties since at least the 1970s. Loan guarantees and insurance preceded loan syndication, which emerged and became widespread in the 1970s. This was followed shortly afterwards by more traditional forms of securitisation.[1] Credit derivatives emerged in the 1990s, and the market for these products has been growing at exponential rates.[2] The International Swaps and Derivatives Association (ISDA) has estimated that the notional amount of credit derivatives outstanding globally was USD 3.78 trillion at end-2003. By mid-2004, this figure had grown to USD 5.44 trillion. While the market has been rapidly expanding, it is useful to put its size into perspective: OTC traded

1 See ECB (2004), *"Credit Risk Transfer by EU banks: Activities, Risks and Risk Management"*, May.
2 Credit derivatives include single-name credit default swaps (CDSs) and different indices, as well as portfolio and basket products embedding credit derivatives, including synthetic collateralised debt obligations (CDOs).

credit derivatives only represent around 2-3% of the more than USD 200 trillion total notional amounts of OTC derivatives outstanding.[3]

Gauging the size and importance of the credit derivatives markets poses several challenges. For instance, notional amounts, which are frequently used to assess the size of derivatives markets, often have little connection with the actual pricing of underlying risk. A recent report published by Fitch Ratings has complemented existing information by shedding some light on the market values of credit protection positions that were bought and sold by surveyed institutions.[4] According to this survey, the reported mismatch – or net transfer of credit risk between counterparties – was approximately USD 22 billion at the time of the survey. All in all, these findings suggest that the risk transfer that actually takes place in this market is far lower than the notional amounts imply.

Table B15.1 Credit derivatives

(notional amounts)

Credit Derivatives (USD billions)	1997	1998	1999	2000	2001	2002	2003	2004	Surveyed institutions
British Bankers Association[1]	180	350	586	893	1,189	1,952*	3,548	5,021*	*BBA member banks*
International Swaps Derivatives Association							3,780	5,440**	*ISDA members*

Note: Data excludes traditional asset-backed securities, guarantees and credit insurance. Whereas the public sector sources (BIS, OCC) report actual volumes of credit derivatives traded by banks, the other sources report estimates (in many cases market participants are directly asked about their estimate of the size of the market). 1 Data excludes assets swaps. See also British Bankers Association (2004); *"BBA Credit Derivates Report 2003/2004"*.
*End of the year forecast,**H1

While credit risk transfer instruments have enabled cross-sectoral risk transfer, the bulk of market activity in the credit derivatives markets has continued to take place between banks. Intra-dealer activities, it seems, explain a large share of market growth in credit derivatives. It also seems that the market is rather concentrated among a few key intermediaries, including some major financial institutions in the euro area. Even though, on aggregate and globally, euro area banks are reported to be protection buyers, approximately half of all banks, particularly those that are regional, continue to act as protection sellers (see Fitch, 2004). Many of these banks are motivated by the more attractive returns of credit derivatives compared to the domestic markets, in addition to using these instruments to diversify their portfolios. In particular, the credit derivatives markets allow such banks to take on exposures to large corporate names they might not otherwise be able to acquire.

Some important changes have taken place in the structure of counterparties in the credit derivatives markets over recent years. The global insurance industry, which had been an active protection seller in credit derivatives instruments, began to pull out of the market in 2003.[5] This

3 These mostly consist of interest rate derivatives.
4 See Fitch Ratings (2004), *"Global Credit Derivatives Survey – Single Name CDS Fuel Growth"*, September.
5 See ECB (2004), *"Credit Risk Transfer by EU Banks: Activities, Risks and Risk Management"*, May.

appears to have continued in 2004. Despite its declining role, the insurance sector continues to be a major seller of protection on aggregate. Taking the place of the insurance industry, hedge funds have become more active in the market. Owing to the fact that hedge funds are not regulated, very little is known about their activities. This means that the transparency of the risk-sharing taking place in the market has been declining. Information on hedge fund activities can be collected from key credit derivatives dealers that have hedge funds as counterparties. On this basis, Fitch Ratings found that, for a number of more active intermediaries, hedge funds can comprise as much as 20-30% of the overall credit derivatives trading volume. Anecdotal evidence also points to hedge funds playing an active role in credit index and other correlation trading.

The growing presence of hedge funds in credit derivatives markets should provide important benefits for the functioning of the market by contributing to its deepening and widening. Over time, this should improve the efficiency of price formation in cash instruments, such as corporate bonds. However, as data are lacking on the credit derivatives positions of hedge funds, this emphasises the need for counterparties in the market to put sophisticated risk management techniques into place and to take a consolidated view on the risks being taken through key intermediaries. Moreover, the growing importance of hedge funds for the functioning of these markets also raises potential concerns related to the possible implications of market liquidity and pricing that could arise from changes in strategies or from market exits. In other words, looking ahead, the financial condition of hedge funds will probably have an important bearing on the future development of the credit derivatives market.

Links between euro area and NMS banks may create a transmission channel for financial fragility originating in the NMSs to the euro area. The major sources of risks for NMS banks are to a large extent related to the rapid pace of credit growth and the potential foreign exchange mismatches in non-financial sectors' balance sheets.

Rapid credit growth can potentially have negative implications for credit quality, particularly if it leads to a sizeable build-up in liabilities. However, the fast expansion of housing loans in the NMSs has so far had a positive short-term impact on the quality of household loan portfolios, owing to the lags between the signing of the loan contract and the accumulation of loan losses. Banks have also adopted on average more conservative LTV ratios than in the euro area. According to available data, LTVs typically do not exceed 70% in most NMSs.

Looking forward, sources of vulnerability could arise from the fact that the share of non-performing loans is likely to rise when the high rate of lending growth begins to decelerate. In addition, risk management may lag behind the lending expansion at times of rapid lending growth, resulting in the underpricing of credit risk. Finally, as mortgage loan contracts typically have floating interest rates in many NMSs, they leave households exposed to changes in interest rates.

A risk that is specific to NMS banks concerns their foreign currency exposures, although the vulnerability of these countries to foreign exchange shocks varies quite significantly. The proportion of foreign currency-denominated assets and liabilities ranges between 14% and 74% and 17% and 67% respectively. The share of foreign currency balance sheet items tends to be highest in countries with either full or quasi-currency boards.

While the currency mismatches between assets and liabilities in banks' balance sheets are in

general small,[15] suggesting contained direct exposures to foreign exchange rate risk in the NMSs, indirect exposures may be more relevant. Indirect foreign exchange exposure for banks can arise through the indebtedness of the domestic non-financial corporate and household sectors in foreign currencies. The proportion of foreign currency-denominated loans is significant in most NMSs, reaching at least 20% in seven countries. The substantial share of foreign currency lending to households and firms that operate in closed sectors of the economy may expose banking sectors to credit risk if these borrowers are hit by losses as a result of rapid exchange rate movements.

While it has to be recognised that cross-linkages may increase the transmission of problems between the euro area and the NMSs, it is also important to stress the positive implications. NMS banks have contributed strongly to the profitability of euro area banks in recent years, and have in turn benefited from the close links with euro area banks through knowledge transfer, including improvements in risk management systems. Looking ahead, over the medium to long run, this will have a stabilising effect on the banking systems in the NMSs.

4.4 SHOCK ABSORPTION CAPACITY OF THE BANKING SECTOR

MARKET INDICATORS

Various market indicators reflected improved banking sector profitability after the end of 2003, coupled with an improvement in banks' external conditions. They can also be interpreted as showing that markets consider the risks lying ahead to be manageable for the majority of large banks.

The average distance-to-default[16] of a sample of large euro area banks began to improve after July 2003. By September 2004, the average values of this indicator had risen to levels not seen since early 1998 (see Chart S43). Additionally, the minimum distance-to-default and the average for the weakest 10% of banks had also improved from the low points reached in early 2003, although they still remained below the levels that had prevailed between January 1998 and mid-2001.

In relation to an analysis of systemic stability, the asset-weighted distance-to-default can be a more useful indicator than the simple average, as the former measures the proportion of the euro area banking sector at risk. While the asset-weighted and simple averages moved in tandem, the asset-weighted distance-to-default consistently remained lower and the gap between the loss widened after late 2001. This suggested that the largest banks in the sample were assessed by market participants to be weaker. However, the gap narrowed in the course of 2003 and 2004 reflecting an improvement in conditions of larger banks as well as suggesting a more homogeneous assessment of the banking sector.

The share of large banks with a weak distance-to-default reading continuously declined from mid-2003 onwards (see Chart S44). By September 2004, 9%, as a share of total assets in the sample, were classified as speculative grade compared with over 70% in the third quarter of 2003. This indicator suggests that substantial improvement has taken place among large euro area banks.

Credit default swap spreads for the euro area banks declined markedly in the course of 2003 (see Chart S45). Notwithstanding a slight upturn in early 2004, they began to fall again in the third quarter of 2004, reaching the lowest levels seen since at least early 2001. Although these patterns generally corroborate the assessment contained in distances-to-default, it cannot be excluded that movements in these spreads might also reflect the hunt for yield that took place across a wide variety of fixed income markets.

15 As a percentage of total assets, the on-balance sheet foreign currency position remains below 5% in most NMSs.

16 The distance-to-default represents the number of asset value standard deviations away from the default point. It is calculated using option pricing theory to solve for the unobservable market value of assets and its volatility from observable equity market capitalisation, volatility figures and leverage data. The default point is defined as the point at which the value of the bank is precisely equal to the value of its liabilities (i.e. its equity is zero).

Rating agency assessments support the analysis above. The major risk factors clouding the outlook for banks' ratings mirrored those discussed in this Review. They were the continued fragility of the economic upturn linked to growing imbalances in the US economy, and the possibility of further oil price increases. Concerning the credit risks of banks, the slow pace of economic recovery in the euro area is not expected to bring about any material decline in the number of SME insolvencies. Furthermore, the concern remains that some banks have excessive single-name concentrations in their loan books. Turning to households, risks from housing markets, where prices had increased significantly in some countries, could manifest themselves either in declining property prices, or weaker consumer confidence.

Turning to the market risks of banks, rating agencies signalled that income from trading activities could suffer from rising interest rates in the course of 2004.

4.5 OVERALL ASSESSMENT

The financial condition of euro area banks began to improve in 2003, and further consolidated in the first half of 2004. The improvement in banks' profits in 2003 relied on further cost-cutting, lower provisioning and income sources other than interest income. According to regulatory capital ratios, banks were able to enhance their capital buffers in 2003.

Rising holdings of fixed income instruments indicate that banks were more exposed to interest rate risk in 2003 and the first half of 2004. In the event of a rise in long-term interest rates, some direct capital losses could be expected from these exposures. In line with the increasing holding of fixed income instruments, there are also some signs of increased market risk-taking by banks. On the basis of VaR readings of major euro area institutions, there are cases where there has been a substantial increase in VaRs, notwithstanding rather low market volatility. In such an environment, careful analysis and monitoring of market risk-taking on the side of supervisors is required to ensure that banks adequately stress test their open positions for unexpected events that are not ordinarily tracked by VaR techniques.

Finally, most of the individual risks identified, such as a rapid unwinding of global imbalances, the indirect effect of potentially prolonged high oil prices and rising long-term interest rates, could ultimately culminate in higher credit risk particularly through SME and household loan portfolios. Exposures to the construction and real estate, as well as to energy-sensitive sectors, warrant close monitoring owing to signs of weakness in the commercial real estate markets in some countries and the substantial recent increase in energy costs. An across-the-board deterioration in credit quality could become an issue in the event of substantially lower than expected economic growth, combined with higher interest rates.

Notwithstanding the above, patterns in market indicators confirm that the financial positions of most large banks in the euro area have improved since late 2002, a time when concerns about fragility were uppermost. Moreover, given that the risks identified in this Review should also be priced into these indicators, this suggests that either the likelihood of these risks crystallising was perceived to be low, or that banks are conidered to be generally well-positioned to deal with them.

5 OTHER EURO AREA FINANCIAL INSTITUTIONS

5.1 FINANCIAL CONDITIONS IN THE INSURANCE SECTOR[1]

The recovery of equity markets after March 2003 helped ease pre-existing balance sheet strains in the euro area insurance sector. In this environment, both life and non-life insurance companies enjoyed a strenghtening of profits in 2003. This facilitated an enhancement of capital bases. Despite some concerns among market participants about the capability of the euro area insurance sector to maintain profit growth, the risks surrounding the outlook for the sector by late 2004 appeared to be balanced.

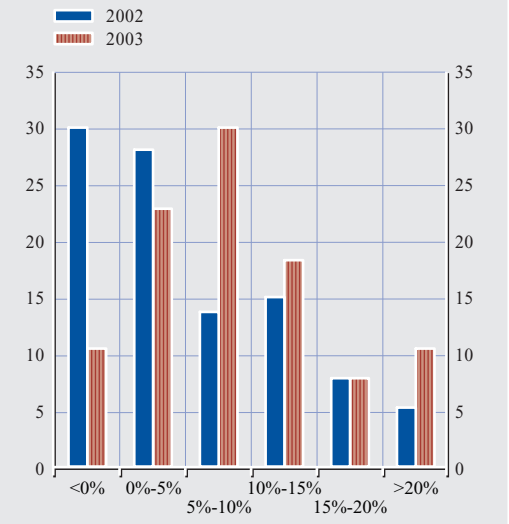
IMPROVED PROFITABILITY IN 2003

Profits (after tax and extraordinary income) grew by more than 20% in 2003 for the euro area insurance sector as a whole. This reversed earlier declines. However, differences in performances were significant across the life, non-life and reinsurance industries.[2]

The average return on equity (ROE)[3] of non-life insurance companies improved significantly from 3% in 2002 to 10.7% in 2003. The ROE of life insurers also rose from 8.6% in 2002 to 10.7% in 2003. The frequency distribution of ROE across the life insurance sector shows that even the weakest firms managed to improve their performance: the share of companies with an ROE of less than 5% declined from around 58% in 2002 to around 33% in 2003 (see Chart 5.1). From a financial stability viewpoint, this is a positive signal. The ROE of reinsurance companies was particularly volatile after 2001 due to significant declines in capital that were related to man-made and natural catastrophes.[4] From an average ROE of 21% in 2002 – which was significantly higher than in 2001 – it dropped to 14.5% in 2003.

Profitability in the insurance business derives from two broad sources of income: net investment income and income from underwriting. Net investment income was an important factor shaping profitability in the reinsurance sector and to a lesser extent also for life insurers. Reinsurers succeeded in capitalising on the upturn in the stock market, achieving net investment income growth of 131.7% in 2003. By contrast, the investment income of non-life

Chart 5.1 Frequency distribution of return on equity of euro area life insurance companies



Source: ISIS.

1 The assessment of the financial conditions of the euro area insurance industry is based on unconsolidated accounts. The source for balance sheet and income statement data was Bureau van Dijk (ISIS database). The sample of firms is composed of 153 life insurers, 255 non-life companies and 30 reinsurance companies.

2 Treating reinsurance companies as a separate sector and thus excluding them from the life and non-life sector samples alters the assessment of these two industry groupings.

3 ROE is calculated as the ratio of profits after taxes and extraordinary income to capital and also, when available, non-distributable reserves, claims of equalisation, of non-life shareholders' funds, of other reserves, of distributable reserves and of profits and losses. The average ROE is weighted by the net premium earned for non-life and reinsurance companies and by the net premium written for life companies.

4 Another factor that is likely to have influenced ROE's in the reinsurance sector is the issuance of catastrophe bonds. Known as "cat bonds", these securities facilitate the transferring of risks related to exceptional events to investors. However, this is not without cost as their issuance may impact both the profits and equity of reinsurance firms. This is because the return paid to the holders of these bonds by reinsurance companies is typically higher than the yields that can be obtained from investing in Treasury bonds: the difference between the two is the premium paid by re-insurers to be covered against significant catastrophes.

insurers underwent a sharp decline in 2003 (-19.5%), unwinding, to a certain extent, a strong performance in 2002 (35.2%).

Life insurers in the euro area were unable to benefit fully from the recovery of the stock market in 2003. This was mainly because earlier balance sheet restructuring after the bursting of the stock market bubble had led to a significant reduction in the equity weights on their balance sheets (see Box 16). At the same time, yields on high-quality fixed income securities remained relatively low and changed little overall during the year. However, life insurers managed to raise their net investment income by 4.9% in 2003, up from -1.2% in 2002.

Concerning patterns in premium income, there were differences in growth across sub-sectors of the insurance industry. Benefiting from the strength of household savings, life companies managed to improve their underwriting results significantly: net average premium income increased by 11.4% in 2003, up from 3.1% in 2002. This was despite the fact that the low level of yields on asset portfolios had led life insurers to reduce the attractiveness of traditional life policies by lowering the guaranteed returns on new policies and by lowering maturity bonuses in 2003. However, with the stock market recovery, the interest of investors in linked products was revived. Investment in unit-linked products grew at rates in excess of 20% in 2003, whereas investment in traditional products only grew at slightly more than 7%. Finally, old policies with high long-term minimum guaranteed returns continued to impinge on the financial results of the whole life insurance segment in 2003.

Growth in net premium income of non-life companies was 7.1% in 2003, identical to the figure achieved in 2002. However, unlike previous years, financial results from underwriting – underwriting income less underwriting expenses – were positive in 2003. Higher policy premia and stricter underwriting

Box 16 Solvency and balance sheet restructuring in the euro area life insurance sector

Persistently low interest rates have left the life insurance sector with significant balance sheet vulnerabilities. In the past, when interest rates were higher than those prevailing towards the end of the 1990s and early 2000s, life insurance companies in the euro area sold savings products to households with guaranteed returns. Given the long-term nature of these policies and that they had fixed returns, strains on profits began to emerge. This was because the yields earned on the asset side became lower than the offered minimum guaranteed returns on the policies they had sold. The continuous declines in interest rate also raised the duration – or interest rate sensitivity – of life insurers' liabilities. In other words, their balance sheets were left increasingly exposed to interest rate risk, as any change in long-term interest rates translated into a change in the net present value of their liability, just as bond prices are affected by interest rate changes. Against this background, this Box examines the ways in which the life insurance industry has attempted to tackle its balance sheet mismatches.

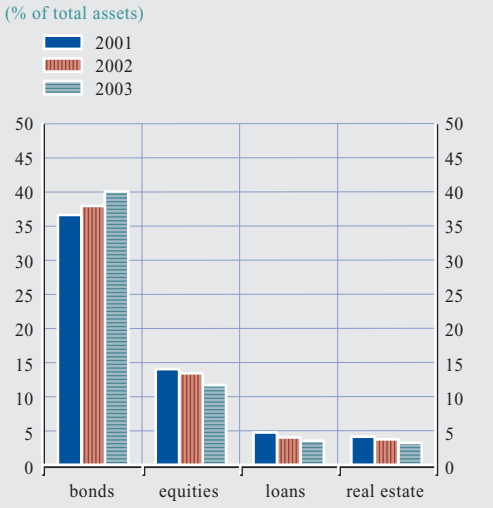
In order to lessen the interest rate risk for the net worth of life insurers, the assets backing the liabilities should ideally be chosen so that they broadly match the duration and convexity of the liability.[1] In the euro area, there are few bonds available with maturities beyond ten years, so that eliminating balance sheet interest rate sensitivities proved challenging. Hence, life insurers turned to equities both for long-term hedges of their liabilities and to increase the yields on

1 The modified duration is a yardstick of the sensitivity of a bond portfolio's value to a small change in interest rates. This relationship is typically not proportional and convexity measures this aspect of the price-yield relationship. Used in conjunction with duration, a more refined estimate of bond price sensitivity to changes in interest rates is possible.

their investment portfolios. They also reacted to their growing balance sheet mismatches by seeking higher returns in the credit derivative market. As a result, the portfolio of euro area life insurance companies became more risky. Then, when equity markets began to tumble from 2000 onwards, the losses on equity holdings strained the solvency of life insurers and reserves were eroded (e.g. hidden, free premium refund and policyholders' free reserves). To avoid a solvency crisis and also in response to pressures from rating agencies, significant distressed selling of equities by life insurers took place in 2001.

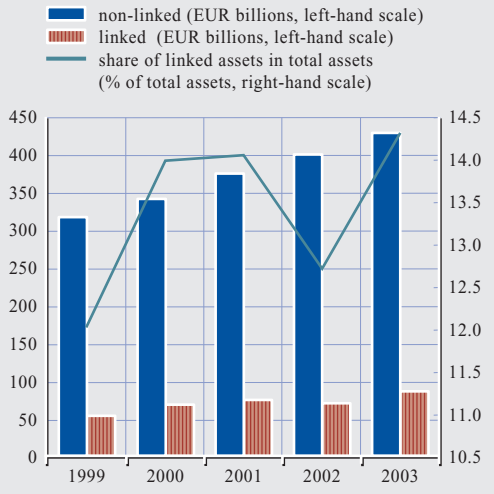
Risk rebalancing was evident in the life insurance industry throughout 2002 and 2003, the aim of which was to reduce investment risk, the most important risk for life insurers, so that capital bases could meet regulatory capital adequacy ratios. The main way in which this occurred was through an increase in the share of bonds in total assets and through a cutting back of the proportion of equities (see Chart B16.1). There were also indications that life insurers had retreated from the credit derivatives markets. However, duration gaps still remained negative, so that low interest rate levels continued to pose challenges for life insurance firms. Insurance companies also attempted to lessen their balance sheet risks in 2003 by transferring investment risks to the household sector. By reducing the guaranteed returns on traditional policies, insurers have sought to encourage households to invest in linked products, whose yield is typically indexed on stock indexes and whose risk is not borne by the life insurer (see Chart B16.2). They had some success with this in 2003, although the share of linked assets only recovered to where it had been in 2000. From a financial stability viewpoint, a shifting of risks to the household sector should overall have a positive effect in the short-term since it reduces strains on life insurers' balance sheets and leads to a wider diffusion of risks. Nevertheless, the medium-term implications are less clear since insurers, as financial intermediaries, are likely to be better positioned than households to bear and manage investment risk over long horizons.

Chart B16.1 Asset portfolios of euro area insurance companies



Source: ISIS.
Note: The data are derived from a sample of 43 composite insurance firms.

Chart B16.2 Linked and non-linked products and the share of linked products in total assets of euro area insurance companies



Source: ISIS.

conditions were the main factors that drove this improvement in the core business of non-life firms. For the reinsurance sector, however, average premium income declined by 1.4% in 2003, contrasting sharply with growth of around 68% in 2002.

BALANCE SHEET RESTRUCTURING

In 2003 non-life and reinsurance companies continued to improve their capital positions, whereas the life sector only managed to halt deterioration in solvency.[5] The solvency positions of insurers can be roughly gauged by the ratio of surplus to total liabilities. The average of this ratio for non-life insurers rose to 25.2% in 2003, up from 23.4% in 2002. For the reinsurance sector, it also increased from 17.7% in 2002 to 23.6% in 2003.

Following three consecutive years of decline, the solvency ratio for the life insurance industry only rose slightly to 3.5% in 2003 compared with 3.4% the previous year. Underlying these aggregate figures, about 25% of life insurers continued to display solvency ratios of less than 2%, showing no sign of improvement compared with 2002. From a financial stability viewpoint, the fact that the weakest capitalised life insurers were unsuccessful in rebuilding capital bases poses a risk.

The reason why it has proved more challenging for life insurers than other insurance companies to improve their solvency positions has been related to their inability to raise net investment income in an environment in which interest rates have remained persistently low. Poor investment performances forced insurance companies to reduce the guaranteed returns on life products, in turn making these products less attractive. Given this and looking ahead, it seems unlikely that the capital bases of life insurers can be rebuilt by raising profitability. This, combined with the fact that relatively unreceptive conditions in equity markets have made it difficult for life insurance companies to raise fresh capital, has added to the challenges the sector has been confronted with.

Another way in which the financially weakest life insurers could improve their solvency positions would be to reduce portfolio risk, which would necessitate some further balance sheet restructuring. However, the incentives to pursue such risk rebalancing in favour of less volatile and more secured investment appear to be relatively weak. In particular, with risks of a sudden upturn in long-term interest discounted into options prices, the risk of capital losses that could be incurred by building up bond positions may have deterred life insurers from this course. Moreover, even if long-term rates were not to rise, such a portfolio reallocation would not contribute positively to net investment income or profits, since returns on fixed income instruments have been relatively low.

Any upturn in long-term interest rates would, in the short run, reduce the value of the fixed income assets held by life insurers and thus the capital return from these securities. Although this poses additional risks for profitability, it would improve the solvency positions of life insurers by reducing the net present value of liabilities by more than the fall in the value of assets, the effect being stronger the wider the negative duration gap.

5.2 RISKS FACING THE INSURANCE SECTOR

Concerning risks and vulnerabilities facing the life insurance sector, there are five key concerns. First, products already contracted at long-term guaranteed minimum returns remain a non-negligible threat to the life sector as they will continue to pose strains on balance sheets. Second, the impending introduction of Solvency II and International Accounting Standards (IAS) by 2007-2009 will increase expenses linked to the implementation of new risk management systems. However, in the medium term the new regulatory requirements should prove to be

5 The solvency ratios of life and non-life/reinsurance companies are not comparable as some of their main components (uncommitted bonus reserves and equalisation reserves respectively) differ owing to sector-specific accounting regulations.

positive for the financial stability of the insurance industry. Third, implicit options embedded in traditional profit-sharing contracts also pose a risk. The fair value of these options was generally not considered to be a concern when stock prices were rising – indeed, due to competitive pressures, these options were frequently not even priced by insurers. A challenge for life insurers will be to provide an adequate valuation of these implicit options in order to limit underwriting risk. Fourth, the euro area life insurance sector remains poorly capitalised. Issuing fresh capital to an unreceptive market may prove to be challenging. Finally, the largest risk facing life insurers is related to rising life expectancies. A catch up in reserves for deferred annuities will prove necessary in the period ahead because of the increase in longevity. As historically reinsurance companies have been rather reluctant in bearing the so-called longevity risk, this could prove to be an ongoing challenge for the life insurance sector.

For the non-life sector, the main risk lying ahead are the accelerating declines in premium rates, which may lead to a significant deterioration in underwriting results. The strong capital base of non-life insurers has exacerbated competition in the industry, putting downward pressure on policy prices. By late 2004, the risk of mispricing is likely to be mitigated by the persistence of low investment returns. The negative correlation observed between net investment and underwriting income, if it remains, would tend to dampen the downward trend in premium rates, at least until portfolio investment returns begin to recover. Looking ahead, the main challenge for non-life companies over the medium to long term will be to adopt more discriminating behaviour in the pricing of policies, so that companies can manage to raise their underwriting results on a sustainable basis, thus enabling them to earn profit on their core business.

Whereas the impact of Florida's hurricanes in 2004 on euro area non-life insurers is likely to be negligible, the impact on the reinsurance sector is expected to be more significant (see Box 17). Recent appraisals of probable losses related to the damages caused by the storms could prove to be more important than originally estimated, as has often been the case following major catastrophes. However, insofar as the expected losses should not be sufficiently large to erode the capital bases of euro area reinsurers, rating downgrades in this sector appear unlikely. This is reassuring as the pernicious effects of trigger clauses included in reinsurance contracts and

Box 17 The impact of Florida's hurricanes on the euro area insurance sector

The 2004 storm season in the eastern US was the most severe since 1886, when four hurricanes struck Texas. The four hurricanes that hit Florida in August and September 2004 caused serious damage to property and, even though a significant portion of the financial cost was borne by the state and by households, led to significant losses for the insurance sector.[1] For multiple events such as successive hurricanes, precise estimates of losses are difficult to compute because they involve mapping specific damage to each storm. Preliminary estimates of the losses from the 2004 hurricane season range between USD 21.2 and USD 26.2 billion, thereby making it the most costly year to date for hurricane-related claims, eclipsing the previous record of USD 22 billion in 1992. This Box assesses the likely impact for the euro area insurance sector.

The losses from hurricane damage that will be incurred by the euro area insurance sector, albeit significant for some important individual companies, are likely to be contained, with any dent in profits unlikely to entail any rating revisions. There are three reasons for this. First, losses

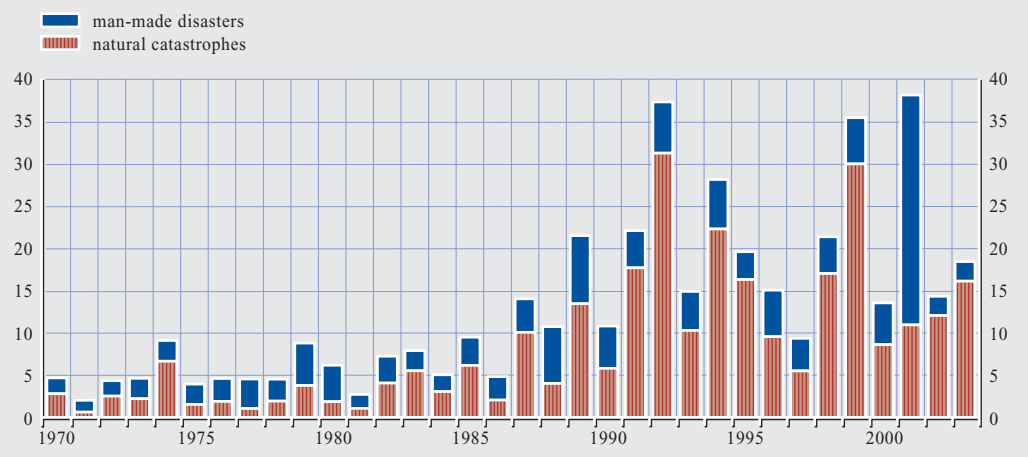
1 The losses related to floods are covered by a public entity, the National Flood Insurance Program, which reduces the insured losses for insurance companies.

must be shared between primary insurers (of homes and commercial property) and reinsurance companies. Primary insurers are mostly located in the US or based in Bermuda, whereas five of the ten largest reinsurers are located in Europe and three in the euro area. Therefore, Florida's events will affect the euro area insurance sector mainly through reinsurance companies. Second, the losses incurred by the reinsurance sector will be limited as the number of successive events is high. This is because of the sharing arrangements that usually exist between primary and reinsurance companies. In a property catastrophe reinsurance contract, the primary insurer usually bears the losses up to a predetermined amount – the attachment point – with all the losses beyond this threshold being incurred by reinsurance companies. A large hurricane with the same aggregated loss as the four separate events would have been far costlier for the reinsurance sector than the costs borne for the four separate events. Indeed for four separate events, primary insurers must pay four times the amount below the attachment point, compared to only one time for a single large event. Third, primary insurers are typically covered against a single event or two events, and after the occurrence of one event, primary insurers have to pay a preset reinstatement premium to continue coverage for subsequent catastrophes. However, in the case of multiple events (more than two), the primary insurance companies will either renegotiate the contract with a new price and terms, or remain uninsured. In the middle of a hurricane season, the latter alternative can probably be ruled out. Therefore, the storm-related losses for reinsurers should be partially compensated by an increase in premium written due to a rise in protection covering multiple events.

The euro area reinsurance sector could be liable for roughly 10% of the total estimated insured losses related to the four hurricanes, with the losses being concentrated among a small number of companies and representing between 2.5% to 11% of their net premium written. Reduced profits of reinsurance companies are however likely to ease the downward pressure on premium prices that was observed in some business lines in 2004. Up to a point, this could even be beneficial for the sector.

Chart B17.1 Real insured losses from disasters and catastrophes

(USD billions)



Source: Swiss Re.

directly related to downgrades of reinsurers have proven to be destabilising in the past. This is because liquidity shrinkage can follow any downgrade as clients of the reinsurance company can withdraw their business and demand a partial reimbursement of the premium paid. Trigger clauses are problematic for financial stability as they make reinsurance companies – which often are effectively insurers of last resort – more vulnerable to the types of runs that can hit banks when there is a loss of confidence. Looking ahead, this could be problematic if the scale and frequency of natural catastrophes were to become more unpredictable, entailing more important and volatile losses for reinsurers.

MARKET-BASED INDICATORS OF THE INSURANCE SECTOR'S SHOCK ABSORPTION CAPACITY

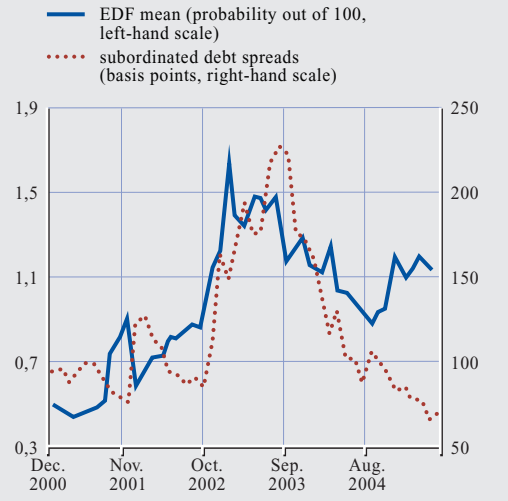
Although the financial position of the euro area insurance sector improved in 2003, market-based indicators have provided conflicting signals on views about prospects in the period ahead (see Chart 5.2). Subordinated spreads continued to narrow after August 2003. On the face of it, this would tend to suggest a positive assessment of the industry's future. However, just as bond spreads have been squeezed by an ongoing hunt for yield across a wide variety of fixed income markets, it cannot be ruled out that this phenomenon has also distorted the indicator properties of traditional yardsticks of credit risk perceptions for the insurance industry.

Indicators based on pricing in equity markets and their derivatives reveal a somewhat different picture to bond spreads. Insurance stock price indexes significantly underperformed relative to the Dow Jones EURO STOXX index in 2004 (see Chart 5.3). However, it is important to note that insurance sector stock prices tend to be highly sensitive to movements in the general stock market, typically outperforming in rising markets and underperforming in bearish markets.[6] Hence, the underperformance of the insurance sector relative to the stock market

6 To some extent, this pattern is often explained by the structure of the balance sheets of insurance companies. As they have long-term, essentially fixed income liabilities, investments in their shares can effectively be seen as leveraged stock market positions. In addition, general strength in equity markets can benefit insurance companies through increasing fees and commissions from policies sold on linked products on the liability side.

Chart 5.2 Subordinated bond spreads and expected default frequencies (EDF) for the euro area insurance industry

(Dec. 2000 – Oct. 2004)



Sources: Moody's KMV and JP Morgan Chase.

Chart 5.3 Cumulative change in euro area insurance stock price indices relative to the Dow Jones EURO STOXX

(Jan. 2004 – Nov. 2004)

Source: Thomson Financial Datastream.

as a whole in 2004 should be seen more as a reflection of the sluggish recovery of the whole equity market than of specific concerns for this sector.

After February 2004, expected default frequencies (EDFs), another equity-based indicator, for the sector began to rise. This suggests that market participants increasingly came to believe that insurance companies would remain challenged by the risks that lie ahead, and that the ability of the sector to absorb disturbances turned negative in the course of 2004.

Differing perceptions of the outlook for the insurance industry have also been apparent in credit ratings. In the first three quarters of 2004, five insurers were downgraded by Fitch, whereas only two were upgraded. Nevertheless, in July both Fitch and S&P revised their outlook for the reinsurance sector from negative to stable, while Moody's followed suit in September.

5.3 OVERALL ASSESSMENT

Euro area insurance companies appear to be on the road to recovery, both in terms of profitability and in improving capital adequacy. The growth in non-life insurers' profits is likely to be sustained in the period ahead. Even though risks remain – as indicated by patterns in expected default frequencies – there are a few signs of an improving outlook. These include the performance of the non-life insurance stock index, decreasing spreads on subordinated debt – notwithstanding hunt for yield considerations – and increasing solvency ratios. Life insurance companies also appear to be slowly improving. However, unlike 2003, the performance of the stock market in 2004 is likely to contribute to a lesser extent to any improvement of net investment income and thus profits. Nevertheless, over the medium term, the capital adequacy of life insurers would improve significantly if long-term interest rates were to rise. Regarding euro area reinsurance companies, the prospects for 2004 are also encouraging, despite the important losses related to hurricanes in the US. Natural disasters that had occurred by late 2004 were only expected to cut into profits to a limited extent.

6 STRENGTHENING EURO AREA FINANCIAL SYSTEM INFRASTRUCTURES

6.1 PAYMENT SYSTEMS

Payment systems are the networks through which financial markets and market participants are interconnected, and are thus essential for the functioning of the financial system. Both market participants and central banks have a strong interest in ensuring that payment systems function in a secure and reliable manner. This is in the interests of market participants because they use payment systems to transfer claims and to pay off liabilities. Central banks have numerous reasons for seeking this: they use payment systems as channels for transmitting monetary impulses; they often offer their own payment systems; and they provide accounts and central bank money for the settling of payments.

Payment systems are vulnerable to failure if they are not sufficiently protected against financial and non-financial risks (see Box 18). In fact, if such risks do materialise, the consequences for the stability of the financial system could be enormous.

PAYMENT SYSTEMS OVERSIGHT

In view of safeguarding payment systems against instabilities and with the aim of avoiding systemic risk, payment systems oversight has two key goals: to promote both the safety and the efficiency of payment systems. The Core Principles report of the Committee on Payment and Settlement Systems (CPSS)[1] recognises the leading oversight role of central banks in payment systems, and explicitly spells out four responsibilities of the central bank in applying the Core Principles.

Payment system oversight is one of the Eurosystem's main tasks. By overseeing payment systems – particularly those that are systemically important, such as TARGET and EURO1 – the Eurosystem contributes to maintaining and strengthening the stability of the financial system of the euro area as a whole and, to some extent, even beyond.

One of the most recent oversight activities carried out by the Eurosystem was the assessment of all euro large-value payment systems, with the exception of EURO1[2], against the CPSS Core Principles. The findings from this assessment were published by the ECB in May 2004.[3] This report concluded that all TARGET components and non-TARGET euro large-value payment systems achieve a high degree of compliance with the Core Principles. With respect to TARGET, the Eurosystem oversight function identified a few issues related to business continuity arrangements and economic efficiency. Regarding business continuity, the main concerns expressed by the overseers related to the fact that, for some local real-time gross settlement systems (RTGSs), a "hot" standby site is located less than one kilometre away from the primary site. Furthermore, a need is seen to simplify the system and the backup procedures as well as to improve testing procedures. However, the experience so far has shown that contingency arrangements can comfortably accommodate TARGET component failures of a short duration. In view of the concerns expressed by the overseers on the economic efficiency of the current TARGET system, it has been noted that all local RTGS systems apply a formal pricing policy and the common TARGET cost methodology, but that cost recovery levels differ significantly. Regarding the review of the non-TARGET euro large-value payment systems, the assessment by the Eurosystem oversight function did not reveal any major shortcomings.

1 The *"Core Principles for Systemically Important Payment Systems"* were published in January 2001 by the CPSS. The Core Principles are increasingly used to assess the soundness of systemically important payment systems. The ECB Governing Council adopted the Core Principles as the minimum standards of the Eurosystem's common oversight policy on payment systems in January 2001.

2 The EURO1 system operated by the Clearing Company of the Euro Banking Association (EBA) falls outside the scope of the assessment exercise because the ECB, in cooperation with the IMF, had already assessed EURO1 in 2001, and found it to be fully compliant with all ten CPSS Core Principles.

3 See ECB (2004), *"Assessment of Euro Large-value Payment Systems against the Core Principles"*, May.

Box 18 Sources of risk in payment systems

Credit risk

The financial risk that a counterparty will not settle an obligation in full, either when due or at any time thereafter. In exchange-for-value systems, credit risk is generally defined to include replacement cost risk and principal risk.

Liquidity risk

The financial risk that a counterparty (or a participant in a settlement system) will not settle an obligation for full value when due. Liquidity risk is usually temporary. It does not imply that a counterparty or participant is insolvent, since these may be able to settle the required debit obligations at some unspecified time thereafter.

Foreign exchange settlement risk

The risk that one party to a foreign exchange transaction pays the currency it sold, but does not receive the currency it bought. This risk is also known as Herstatt risk.

Legal risk

The risk of loss arising from the unexpected application of a law or regulation or because a contract cannot be enforced.

Technical/operational risk

The risk of human error (including system management failures), deficiencies in information systems (e.g. as a result of a breakdown of some component of the hardware, software or communications systems or a terrorist attack) or failure of internal controls which are crucial for settlement. Technical/operational risk may cause or exacerbate credit or liquidity risk.

Systemic risk

The risk that the failure of one participant in a transfer system or a disruption to the system itself or in financial markets will result in other participants in the system or financial market participants not being able to meet their obligations when due (the so-called domino effect). Systemic risk is a consequence of the materialisation of (non-) financial risks.

LATEST DEVELOPMENTS IN TARGET

TARGET is the payments backbone of the euro area. TARGET offers settlement in central bank money with immediate finality: the receiving participant can always be certain that funds received through TARGET are unconditional and irrevocable. Participants in TARGET incur neither principal nor credit risk through participation in this system.

In order to analyse the status of the TARGET system's security and its operational reliability, as well as to provide the ECB decision-making bodies with a picture of the overall risk situation in TARGET, the Eurosystem's TARGET operational function recently carried out a TARGET security assessment based on a new risk management framework. The methodology employed involved comparing TARGET with a

theoretical but ideally secured and operationally reliable payment system. It was concluded that TARGET, compared with this predefined benchmark risk profile, is subject to some residual risks, a fact which, owing to the very nature of payment systems, cannot be ruled out. To the extent that these residual risks can be further mitigated, follow-up action plans have been established and will be implemented in due course.

TARGET2

Since the introduction of the euro on 1 January 1999, technical developments and market pressures have been supporting a process of market infrastructure consolidation. This can be seen in the Decision of the ECB Governing Council on 24 October 2002 on the long-term strategy for TARGET, which acknowledged that, although TARGET had successfully met its main objectives, namely to provide a sound channel for the implementation of the ECB's monetary policy and to contribute to the development of a single euro money market, its heterogeneous design, reflecting the reality of the mid-1990s, would translate over time into a number of problems for its users, who increasingly expect a more harmonised service. Cost efficiency was also considered problematic. Last, but not least, the ability of the present TARGET system to cope with new challenges, particularly those posed by EU enlargement, was questioned.

The TARGET2 payment system will replace the current TARGET system, and is expected to address fully all these issues, which were also identified in the above-mentioned assessment against the CPSS Core Principles and the TARGET security assessment. The system is scheduled to go live in 2007.[4] In general, six features distinguish TARGET2 from the current TARGET system, providing a system that will be even more resilient to severe disruptions and even more robust to financial and non-financial risks. First, the current decentralised system composed of 16 local RTGS systems will be consolidated into a single technical platform. Second, considering the high liquidity needs of an RTGS system, TARGET2 will offer state-of-the-art liquidity management tools and liquidity-saving features, combining the advantages of RTGS systems – including immediate finality and zero credit risk – and net settlement systems which have low liquidity needs. Third, TARGET2 will apply the latest technology and standards. Fourth, it will take the high time-criticality of some types of payments into account by enabling participants to submit timed transactions, such as those needed for Continuous Linked Settlement (CLS) payments. Fifth, regarding the large number of ancillary systems, such as securities settlement systems and retail payment systems, that have to settle in TARGET2, the main advantage of TARGET2 for them will be that they will be able to reach any RTGS account on the single technical platform through a standardised interface. Sixth, TARGET2 will offer the highest possible level of reliability and resilience, as well as robust business continuity and contingency arrangements which are commensurate with the systemic importance of the TARGET infrastructure (see Box 19).

TARGET2 will be able to perform its critical tasks under abnormal circumstances, overcoming failures that require on-site recovery, alternate site recovery, and alternate region recovery. Business continuity arrangements will be based on cutting-edge technology. High service continuity, performance, availability, resilience and security will be major cornerstones. TARGET2 will ensure that critical payments are processed within 30 minutes and that all other payments are at least processed with the same value date. Furthermore, the operating day will end with a maximum delay of two hours, the two sites will be in different locations and will have different risk profiles, and the secondary region will be able to restart within two hours. Special technical (e.g. firewalls) and organisational (e.g. security policies) measures will address issues related to cyber attacks (e.g. virus infections).

4 Banca d'Italia, the Banque de France and the Deutsche Bundesbank proposed to build and operate the future system.

Box 19 Business continuity in payment systems

The rapid recovery and resumption of payment systems, in particular for systemically important payment systems (SIPS), is a key prerequisite for the resilience of the financial system to adverse shocks. In light of the new risks posed by the post 11 September environment, a number of efforts are currently under way worldwide to improve the recovery and resumption capabilities of payment systems. The objective is to provide guidance to system operators so that sufficiently robust and consistent levels of resilience are achieved across those systems. From a practical perspective, the evolution of the oversight policy for payment systems will consist of a further specification of Core Principle VII. This Principle states that *"the system should ensure a high degree of security and operational reliability and should have contingency arrangements for timely completion of daily processing"*, but contains implementation guidelines that only cover business continuity arrangements in a rather generic way.

The main elements of business continuity plans that should contribute to ensuring a level of resilience of payment systems consistent with the objective set out by CP VII are the following:

1. Systems should have a well-defined business continuity strategy, which should be endorsed by senior level management. Critical functions should be identified and processes within those functions categorised according to their criticality. Business continuity objectives should aim at the recovery and resumption of the critical functions within the same settlement day.

2. Business continuity plans should envisage a variety of plausible scenarios, including major, wide area disasters. Systems should have a secondary site and the latter's dependency on the same critical infrastructure components used by the primary site should be the minimum compatible with the stated recovery objectives under the scenarios considered. Well-structured crisis management teams and formal procedures to manage crises should be set up.

3. The effectiveness of the business continuity plans needs to be ensured through regular testing of each aspect of the plan. Performing whole days of live operations from the backup site should be considered, and the latter should also be periodically tested with the backup facilities of major participants. Participation of systems in industry-wide testing could be implemented. The business continuity plans should be periodically updated and their disclosure by system operators considered.

SETTLEMENT IN EURO LARGE-VALUE PAYMENT SYSTEMS CONTINUES TO GROW[5]

TARGET

From a financial stability perspective, it is preferable that very high-value payments should be processed safely via RTGS systems such as TARGET. The trend towards settling large-value payments in TARGET, the RTGS system for the euro which commenced operations on 4 January 1999, continued in 2004, in line with the Eurosystem's policy of encouraging large-value payments to be settled in central bank money. In terms of their value, 89% of all large-value payments settled through euro large-value payment systems were settled through TARGET by October 2004, slightly above the level reached in 2003. This is up from 69% in 1999 (see Chart 6.1).

Considering the fact that, in 2004, five of the national RTGS systems that are part of the

5 Large-value payments are mainly exchanged between banks or between participants in the financial markets, and usually require urgent and timely settlement.

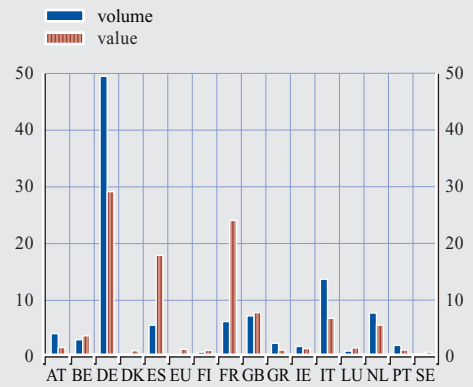
Chart 6.1 Large-value payments processed via TARGET

(Jan. 1999 – Oct. 2004, % of total value of EUR transactions)

Source: ECB.

Chart 6.2 Large-value payments processed via TARGET

(Jan. 2004 – Jun. 2004, % of the NCBs'/ECB's share in terms of value and volume)



Source: ECB.

TARGET system had a share of 82% in terms of volume and 83% in terms of value of all transactions sent via TARGET, it is particularly important for financial stability in the euro area that these systems are reliable and secure to avoid adversely affecting the smooth functioning of TARGET as a whole (see Chart 6.2).

EURO1

EURO1 is the largest privately operated EU-wide multilateral deferred net settlement system for euro credit transfers. It is owned by some 70 large international commercial banks both within and outside the EU, all of which are members of the Euro Banking Association (EBA). The ECB assessed EURO1 in close cooperation with the IMF, and found the system to be fully compliant with all ten CPSS Core Principles. As the overseer of EURO1, the ECB acknowledges that EURO1 has sound risk management features that protect the system against the materialisation of credit and liquidity risk to the greatest possible extent.

One notable development in EURO1 is that the average value of any payment processed has consistently fallen since EURO1 went live on 4 January 1999. Whereas the average value per payment was EUR 1.8 million in 2001, this figure had dropped by October 2004 to EUR 1.1 million. From a financial stability perspective this is a welcome development, because the lowering of the volume of very high-value payments processed via EURO1 is paralleled by the increasing volume of such payments made in RTGS mode, notably in TARGET.

Since the EBA undertook a review of its business continuity plans in 2002, which led to the relocation of its secondary site to another city, no changes to the infrastructure of the EURO1 system have taken place.

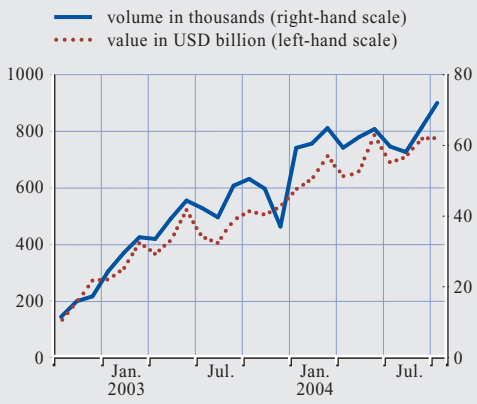
CLS

The Continuous Linked Settlement (CLS) system began settling foreign exchange (FX) transactions in September 2002. After having added four new currencies in September 2003, CLS now settles eleven major currencies, with steadily increasing amounts settled. Between October 2002 and October 2004, for example, there was a six-fold increase in the value of trades settled in CLS equivalent to USD 772 billion (see Chart 6.3).

Every FX trade gives rise to payment flows in the two currencies involved. CLS, thanks to its Payment versus Payment (PVP) mechanism,

Chart 6.3 Volumes and values of FX trades settled via CLS in USD billion equivalent

(Oct. 2002 – Oct. 2004)



Source: ECB.

has in October 2004 eliminated an average daily amount of more than USD 1.5 trillion[6] of foreign exchange settlement risk. Thus, CLS substantially reduces systemic risk. It is thought that the values currently settled via CLS constitute approximately one-quarter of the entire global FX market. Accordingly, FX settlement risk remains relevant for those trades that are settled outside CLS. However, with new participants joining and existing participants connecting additional branches, it is expected that the settlement values in CLS and the system's market share will continue to grow. In addition, CLS has planned to include four additional currencies by the end of 2004, namely the New Zealand dollar, the Hong Kong dollar, the South Korean won and the South African rand. Therefore, FX settlement risk should in general further decrease. The euro, with a settlement share of 22%, is the second most settled currency in CLS after the US dollar with 48%.

CLS has greatly reduced banks' liquidity needs for FX settlement because CLS funding positions in the respective currencies are calculated on a net basis. Due to this netting effect, the participants' funding requirements average below 3% of their settled transactions, thus reducing liquidity risk. Nevertheless, even though liquidity needs are reduced, an increase in liquidity risk is inherent in the CLS process. This is because CLS requires participants to pay by a certain time, whereas such time-criticality does not apply for FX payments settled outside the CLS framework.

During its two years of operation, CLS has been very stable, settling all the trades submitted with the exception of two technical incidents in 2003, which had no systemic implications.

CORRESPONDENT BANKING

Apart from interbank funds transfer systems (IFTSs), correspondent banking arrangements represent another important channel of payment flows, even though they are significantly less important than payment systems such as TARGET. Contrary to what might have been expected before the launch of the euro, correspondent banking within the euro area continues to be of high importance, despite the establishment of IFTSs operating in euro. Correspondent banking in euro in the EU is a highly concentrated activity involving only a few players. A recent survey conducted by the ESCB among a sample of banks in the EU showed that the top 10% of reporting banks accounted for almost 80% of the value (and 34% of the volume) of the reported correspondent banking payments in euro.

At this stage, the Eurosystem has assessed there to be no immediate systemic risk in the high degree of concentration of correspondent banking. This is because the large majority of payment flows are executed via IFTSs such as TARGET. However, in view of the Eurosystem's interest in the stability of the financial system as a whole, it will continue to monitor developments in this particular area of business and to assess risks specific to correspondent banking arrangements.

6 The degree of FX settlement risk that is eliminated by CLS is not identical to the settlement values, since a certain amount of this risk is reintroduced by so-called in/out swaps, which facilitate liquidity management.

SWIFT

The financial industry depends heavily on secure messaging services. The large majority of financial institutions rely on SWIFT – an industry-owned cooperative that supplies secure, standardised messaging services and interface software – for these messaging needs. Therefore, the operational reliability and security of SWIFT is particularly important for the financial industry and has some significant consequences.

In 2002, SWIFT announced its plans to migrate away from older technologies (the so-called X.25) to an internet-based telecommunication protocol (the so-called Internet Protocol, IP) which is available through the SWIFTNet service. IP allows geographically diverse networks of computers to communicate with each other. The X.25 is a data communications interface specification adopted as a standard by the International Consultative Committee for Telegraphy and Telephony (CCITT). X.25 was developed in the era of simple terminals that directly connected to host computers via specific endpoints (modems) using a public telecommunications network. The IP protocol, on the other hand, allows random access from a single point to other endpoints available on the internet. There are a number of business and technical factors that drive this migration from X.25 to IP networking. The business drivers for the migration include customer demand for IP-based services, the need to reduce operational costs, and SWIFT's strategy to deliver new or enhanced services globally via the internet and, concurrently, to increase market penetration with current service offerings. Technical drivers for the migration include the increasing cost of the X.25 infrastructure (support, maintenance, etc.), and diminishing X.25 network skills available in the market. By migrating to the IP-based SWIFTNet service, SWIFT prevents the risk of obsolescence related to X.25-based technologies. Since it is increasingly hard to assure vendor support for X.25, prolonged use of these technologies might negatively affect SWIFT's operational reliability, which would be a very unwelcome development from a financial stability perspective. SWIFTNet's infrastructure migration plan also includes Public Key Infrastructure (PKI) security services. PKI will be the mandatory SWIFT product required to secure the SWIFTNet services with authentication, non-repudiation, integrity, confidentiality and access control capabilities. From SWIFT's perspective, the change thus represents a move to industry standards, not only for connectivity but also for security reasons.

The migration to SWIFTNet started in August 2002 and SWIFT has planned to migrate all message traffic to SWIFTNet by the end of 2004.

The G10 central banks and the ECB are increasing their involvement in the security issues associated with the use of IP, an industry standard that is more omnipresent than X.25, and thus more open to potential threats. The ECB's involvement in the cooperative oversight of SWIFT (in co-operation with the G10 central banks) aims at ensuring that SWIFT has in place appropriate structures, processes, procedures and controls to manage effectively the risk it may pose to the financial industry and to market infrastructures.

6.2 SECURITIES CLEARING AND SETTLEMENT SYSTEMS

Since the start of EMU, a process of integration has been underway within the financial markets of the euro area. As a result, the frequency of securities trades that are cleared and settled across borders in the euro area has risen. However, the costs for post-trade services across borders have remained high when compared to domestic clearing and settlement costs. One reason for this is the fact that cross-border clearing and settlement often involves cross-system clearing and settlement, as trading partners located in different countries often do not use the same clearing and settlement system. To lessen the need for cross-system clearing and settlement, market participants and public authorities have called for international consolidation of clearing

Table 6.1 CSDs in the euro area

Country	January 1999	October 2004
Belgium	NBB-SSS CIK Euroclear	NBB-SSS CIK Euroclear Bank
Germany	Deutsche Boerse Clearing (DBC)	Clearstream Frankfurt (former DBC)
Greece	BOGS CSD SA	BOGS CSD SA
Spain	CADE SCLV Espaclear SCL Bilbao SCL Barcelona SCL Valencia	Iberclear SCL Bilbao SCL Barcelona SCL Valencia
France	Sicovam	Euroclear France (former Sicovam)
Ireland	CBISSO NTMA	NTMA
Italy	Monte Titoli CAT	Monte Titoli
Luxembourg	Cedel	Clearstream Luxembourg (former Cedel)
Netherlands	Necigef	Euroclear Netherlands (former Necigef)
Austria	OeKB	OeKB
Portugal	Interbolsa SITEME	Interbolsa SITEME
Finland	APK	APK

Source: ECB (2004).

Table 6.2 Euro area CCPs for financial instruments

Country	January 1999	October 2004
Belgium	ELFOX (derivatives)	one
Germany	Eurex Clearing (derivatives)	Eurex Clearing (derivatives, repos, securities)
Greece	ADECH (derivatives)	ADECH (derivatives)
Spain	MEFF Renta Fija (derivatives on debt instruments) MEFF Renta Variable (derivatives on equities)	MEFF Renta Fija (repos, govt bonds, derivatives on debt instruments) MEFF Renta Variable (derivatives on equities)[1]
France	Bourse de Paris (SBF) (equities and options); Matif (derivatives; subsidy of SBF) Clearnet (repos, govt bonds; subsidy of Matif)	LCH.Clearnet SA (derivatives, repos, securities, also for markets in BE, NL, PT and for MTS markets)
Ireland	none	none
Italy	CC&G (derivatives)	CC&G (derivatives, securities, also for MTS Italy)
Luxembourg	none	none
Netherlands	Effectenclearing (securities); EOCC (derivatives)	none
Austria	Vienna Stock Exchange (derivatives)	Vienna Stock Exchange (derivatives)
Portugal	BVLP (derivatives)	none
Finland	HEX (derivatives)	OMX (derivatives)

[1] MEFF Renta Fija and MEFF Renta Variable belong to the same holding company.
[2] LCH. Clearnet SA is incorporated in France, but also serves the markets in Belgium, the Netherlands and Portugal.

Source: ECB (2004).

and settlement systems, especially of central counterparties (CCPs) and central securities depositories (CSDs).

The industry has responded to these requirements in several ways. By October 2004, the number of CSDs located in the 12 countries of the euro area had been only slightly reduced, dropping from 23 in January 1999 down to 19 in October 2004 (see Table 6.1). However, whereas back in January 1999 no two CSDs in the euro area belonged to the same group, several corporate CSD groups have since been formed. Clearstream International comprises Clearstream Frankfurt and an international CSD, Clearstream Luxembourg. Euroclear Group consists of the international CSD Euroclear Bank and the national CSDs Euroclear France, Euroclear Netherlands and CrestCo (UK). The Finnish APK, together with the CSDs of Latvia and Estonia, belong to OMX Group which, in September 2004, signed an agreement with the Swedish CSD VPC to merge APK and VPC by the end of 2004. Finally, all four Spanish CSDs are now organised under one holding company.

In the field of CCP clearing, developments have been somewhat different. Between January 1999 and October 2004, the number of CCPs for financial instruments (derivatives, securities, repos) in the euro area dropped from 14 to eight (see Table 6.2). This relatively sharp decline was driven by developments in the Euronext countries (France, Belgium, the Netherlands and Portugal). In May 1999, the three French CCPs were merged into Clearnet SA, while in 2001, Clearnet took over the activities of the Dutch and Belgian CCPs. In 2003, Clearnet SA and London Clearing House (LCH), the UK's CCP, were brought under a common holding company. Clearnet SA was renamed LCH. Clearnet SA and LCH was renamed LCH.Clearnet Ltd. Finally, in 2004 LCH.Clearnet SA took over the activities of the Portuguese CCP.

Overall, the process of consolidation of CSDs has so far mainly resulted in the mere restructuring of legal entities. CSD groups have been formed without technical mergers or the closing down of major CSDs. In the case of CCPs, on the other hand, there have been more technical mergers and a reduction in the number of legal entities acting as CCPs. This notwithstanding, technical consolidation will probably also take place soon in the field of CSDs. Euroclear, for example, has announced that it will establish a single IT platform which all CSDs in the group will use by 2006. For its part, Clearstream Frankfurt has been using for several years the settlement platform of Clearstream Luxembourg for some activities.

Ongoing consolidation of clearing and settlement systems will probably increase the technical efficiency of the clearing and settlement of cross-border securities transactions in Europe, as it should reduce, on average, the number of different systems that are involved. In turn, this means that less information and fewer instructions will have to be sent from one system to another, which may reduce the risk of failures and thus systemic risk. On the other hand, consolidation will also lead to the concentration of activities within a few large systems. If such systems were to fail, the securities markets could be severely disrupted, and it may take some time to fill the gap created by their failure (see the Special Feature on Securities Settlement Systems and Financial Stability).

Apart from the tendency towards consolidation of CCPs, Table 6.2 reveals another trend. In January 1999, almost all CCPs in the euro area cleared only derivatives transactions. However, in recent years they have expanded their activities, and many CCPs now also cover repos and securities trades. CCPs seemto be looking for new business opportunities in an increasingly competitive market. From a risk perspective, this may constitute a positive trend. By assuming counterparty risk, CCPs remove it from their trading partners. As CCPs specialise in managing risk, they are also better placed to cope with counterparty risk. The current search of CCPs for more business may thus offer the potential to make financial markets safer.

Consolidation of CSDs, consolidation of CCPs and the search of the latter for more business tends to go hand in hand with an internationalisation of the activities of clearing and settlement infrastructures. There is therefore an increasing need to coordinate the activities of overseers and regulators of clearing and settlement systems across countries. In this light, the ESCB and the Committee of European Securities Regulators (CESR) set up a joint working group in October 2001 to design new standards for securities clearing and settlement systems. The purpose of the joint working group was to adapt the CPSS-IOSCO recommendations on securities settlement systems (see Box 20) to the EU environment. A first set of 19 draft ESCB-CESR standards was published for consultation in July 2003. In October 2004, a report with the 19 standards was approved by the Governing Council of the ECB and by CESR. The standards will come into force when an "assessment methodology" has been developed.

Box 20 CPSS-IOSCO Recommendations for securities settlement systems

In November 2001, recommendations were published for the design and operation of securities settlement systems, drafted by a joint task force of the Committee on Payment and Settlement Systems (CPSS) of the central banks of the Group of Ten countries and the International Organisation of Securities Commissions (IOSCO).[1] These 19 CPSS-IOSCO recommendations set out minimum standards that securities settlement systems should meet. They encompass the legal framework for securities settlement, risk management procedures, access, governance, efficiency, transparency and regulation and oversight, and they explicitly aim at "maintaining financial stability by strengthening the financial infrastructure". This Box discusses some of the recommendations that have a direct relation to financial stability.

Some of the CPSS-IOSCO recommendations address credit risk. Credit risk is the risk of loss due to the default of another party. For example, one party in a securities transaction, say bank A, may not be able to fulfil its delivery obligation, on the settlement date or later, typically due to insolvency. The other party, say bank B, may lose up to the full value of the assets involved in the transaction (principal risk). This is the case if assets are transferred from B to A and included in A's estate so that A's creditors can claim them, even though no assets have been transferred from A to B. As a consequence, B and B's creditors may also become insolvent. To avoid this type of contagion, CPSS-IOSCO recommendation 7, for example, suggests that CSDs should settle in delivery versus payment (DVP) mode. This means that if a transaction involves delivery of securities (from the seller to the buyer) and payment of money (from the buyer to the seller), then securities are delivered if and only if money is actually paid.

Defaulting is not only limited to one party in a transaction: it is also possible for an operator of a securities settlement system or a cash settlement agent (i.e. a bank in which cash is held that is used to settle the cash leg of transactions). The default of a settlement system or of a major cash settlement agent could potentially disrupt a large part of the financial markets. Recommendation 9 therefore suggests that CSDs should provide no credit or only limited, and preferably secured, credit to participants or other parties. Recommendation 10 proposes that measures should be taken to avoid a situation whereby participants in a CSD incur losses from the default of a cash settlement agent. It also expresses a preference for the central bank to act as the cash settlement agent for all transactions settled in a CSD.

Another concern addressed by the CPSS-IOSCO recommendations is liquidity risk. Liquidity risk arises if one party in a securities transaction, say again bank A, is unable to fulfil its delivery obligation in time. Settlement is postponed in this case and carried out later. However, the other party, bank B, can still incur losses if it urgently needs funds (B has sold securities to A) or securities (B has bought securities from A). In the worst case, B has already sold on the funds or securities to a third party and consequently finds itself unable to fulfil the delivery obligation in time. To avoid such contagion effects, recommendation 5 suggests that participants in settlement systems should have access to securities lending and borrowing arrangements so that they can borrow securities if needed. Recommendation 4 promotes another alternative to mitigate liquidity risk that also helps in reducing some forms of credit risk, the establishment of a central counterparty (CCP) clearing house.

1 See *"Recommendations for Securities Settlement Systems: A Report of the Committee on Payment and Settlement Systems and the Technical Committee of the International Organisation of Securities Commissions"*, BIS and IOSCO, November 2001 (www.bis.org and www.iosco.org).

Finally, recommendation 11 aims at strengthening the operational reliability of securities (clearing and) settlement processes. It is clear that the technical breakdown of a settlement system or any other important settlement service provider would lead to substantial disruption of the financial markets. Recommendation 11 therefore stresses the need for reliable and secure systems, and furthermore suggests that backup facilities should be put in place to avoid information loss, and that measures should be taken to ensure that activities can be resumed quickly in case of technical problems.

Central banks and regulators have used the CPSS-IOSCO recommendations several times since 2002 to assess settlement systems. In addition, they have been used extensively by the International Monetary Fund and the World Bank in undertaking their Financial Sector Assessment Program (FSAP) assessments. In October 2001, the ESCB and CESR set up a joint working group to adapt the CPSS-IOSCO recommendations to the EU environment. After intense discussions with interested parties, the ESCB-CESR working group drafted a report with a set of 19 standards that was formally approved in October 2004. The standards will come into force when an "assessment methodology" has been developed. These standards aim at strengthening the CPSS-IOSCO recommendations in the European context. Furthermore, it is expected that the ESCB-CESR standards will become part of national legislation, making them also easier to enforce.

The Eurosystem regularly assesses CSDs eligible for Eurosystem credit operations against the standards established by the EMI in 1997.[7] Although the assessment of CSDs against the Eurosystem standards aims at ensuring that the Eurosystem will not be exposed to inappropriate risks when conducting its monetary policy operations, it has also contributed to reducing risks of financial system instability in the euro area. For example, the Eurosystem standards require CSDs to have measures in place that will protect them against operational failure and bankruptcy. Operational failures or bankruptcies of CSDs could disrupt the entire market and not only Eurosystem monetary policy operations (see the Special Feature on Securities Settlement Systems and Financial Stability). It is planned that the ESCB-CESR standards will soon replace the Eurosystem standards. CSDs would then be assessed against the ESCB-CESR standards, and an addendum to these standards that takes into account specific needs of the Eurosystem will be drafted.

In March 2004, the CPSS-IOSCO task force published a consultative report with a set of draft recommendations for CCPs. International standards for CCP risk management procedures can be seen as a critical element in promoting the safety of financial markets. The CPSS-IOSCO task force is currently reviewing the comments received in the consultative process in order to finalise the recommendations based on these comments.

To sum up, it may be emphasised that the European securities clearing and settlement industry is changing rapidly. Since clearing and settlement systems are essential for financial markets, it is important to follow these developments closely from a regulatory and oversight perspective. ESCB-CESR and CPSS-IOSCO are making an important contribution in this respect.

7 See EMI (1997), *"Standards for the Use of EU Securities Settlement Systems in ESCB Credit Operations"*.

IV SPECIAL FEATURES

A CROSS-BORDER BANK CONTAGION RISK IN EUROPE

INTRODUCTION AND BACKGROUND

Contagion across banks is widely perceived to be an important element in banking crises and thus a major systemic stability concern. For example, the private sector rescue operation of Long Term Capital Management (LTCM), which was coordinated by the Federal Reserve Bank of New York, was justified on the grounds of the risk of contagion to banks. Similarly, contagion risks transmitted through the interbank market played a major role in the decisions of the Bank of Japan to react to the failures of major Japanese securities houses in the early 1990s. Generally, however, evidence of the significance of contagion is fairly limited.

This special feature analyses the risk of cross-border contagion for large European banks. Given the innovative nature of the empirical approach, the results presented in the article should be interpreted with a high degree of caution. The main objective of the article is to draw attention to a potentially highly relevant financial stability issue, which so far may have been under-explored. The term "contagion risk" in this article refers to the transmission of an idiosyncratic shock affecting a bank or possibly a set of banks, and its transmission to other banks. The latter could take place through the interbank market, payment systems, contagious bank runs or asset markets.[1] Defined in this way, contagion is a subset of a broader concept of systemic crisis. Analytically, therefore, the identification of contagion crucially depends upon empirically distinguishing between a common shock that affects more than one bank, and contagion per se. From a policy perspective, the difference is very important as the policy reaction to the failure of a single large bank requires a rapid assessment of its systemic importance.

More specifically, the analysis focuses on the spillover effects of very large shocks among EU banks in the absence of a large-scale systemic crisis.[2] The approach identifies contagion among banks using large shocks to banks' distance-to-default. The distance-to-default represents the number of asset value standard deviations away from the default point. The default point is defined as the point at which the value of the bank is precisely equal to the value of its liabilities (i.e. its equity is zero). It has been shown that the distance-to-default is a complete and unbiased predictor of bank fragility and seems to align well with the objectives of supervisors.[3] The advantage of using a market-based indicator to measure contagion is that there is no need to take a specific view on the channel of contagion.

A large shock is defined as a shock putting the bank in question in the lower 95th percentile of the distribution of the weekly first differenced distance-to-default. This is somewhat arbitrary but it reflects a compromise between focusing on large shocks and maintaining sufficient sample sizes to conduct empirical estimation. In the next step, the number of banks that were simultaneously in the tail is counted. This is labelled "coexceedances" in the literature.[4] The

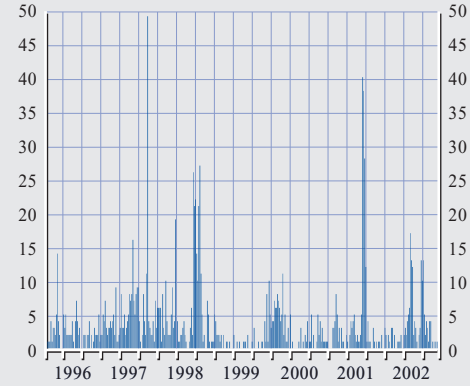
1 Contagion among banks via the interbank market may arise from unforeseen liquidity shocks (see, for instance, Allen, F. and D. Gale (2000), *"Financial Contagion"*, Journal of Political Economy 108 (1), pp. 1-33; Freixas, X., B. Parigi and J. C. Rochet (2000), *"Systemic Risk, Interbank Relations and Liquidity Provision by the Central Bank"*, Journal of Money, Credit, and Banking 32 (3/2), pp. 611-40) or from credit risk in the interbank market, namely deposits at other banks not being repaid (see, for instance, Furfine, C. H. (2003), *"Interbank Exposures: Quantifying the Risk of Contagion"*, Journal of Money, Credit and Banking 35 (1), pp. 111-28, Upper, C. and A. Worms (2002), *"Estimating Bilateral Exposures in the German Interbank Market: Is There a Danger of Contagion?"*, Deutsche Bundesbank Discussion Paper No 9; Degryse, H. and G. Nguyen (2004), *"Interbank exposures: An Empirical Estimation of Systemic Risk in the Belgian Banking Sector"*, paper presented at the ECB/CFS Symposium on *"Capital Markets and Financial Integration in Europe"*, May).

2 The article is largely based on results reported in Gropp, R. and G. Moermann (2004), *"Measurement of Contagion in Bank Equity Prices"*, Journal of International Money and Finance 23, pp. 405-59; and Gropp, R. and J. Vesala (2004), *"Bank Contagion in Europe"*, paper presented at the ECB/CFS Symposium on *"Capital Markets and Financial Integration in Europe"*, May.

3 See Gropp, R., J. Vesala and G. Vulpes (2004), *"Equity and Bond Market Signals as Leading Indicators of Bank Fragility"*, forthcoming: Journal of Money, Credit and Banking; and Gropp, R., J. Vesala and G. Vulpes (2004), *"Market Indicators, Bank Fragility and Indirect Market Discipline"*, Policy Review 10 (2), Federal Reserve Bank of New York, September, pp. 53-62.

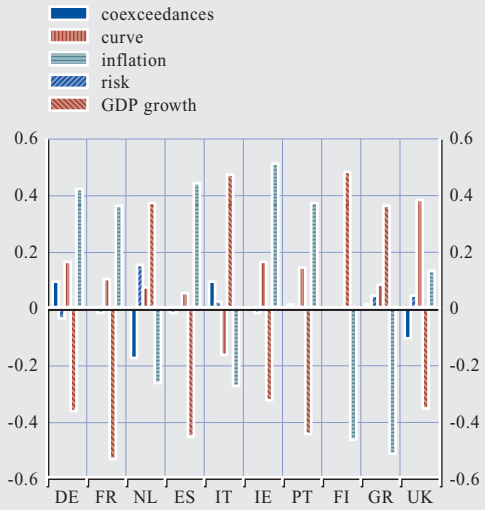
4 See Gropp and Moerman (2004), op. cit.

Chart A.1 Weekly number of coexceedances (banks in the 95th percentile)



Source: ECB.

Chart A.2 Correlation of the underlying variables with common factors (factor loadings), domestic factor 1



Source: ECB.

sample consists of 67 major European banks, of which 51 are from euro area countries.

The number of coexceedances can be interpreted as a simple measure of the degree of systemic risk during a given week (see Chart A.1).[5] Two spikes stand out: one during the first two weeks of October 1998 (Russia's default/the LTCM crisis) and the second during the week of September 11 (the day of the terror attacks on the US). Both reflected common disturbances in the financial system, rather than contagion. The chart highlights the fact that the number of coexceedances can be interpreted as an indicator of the degree of systemic risk; it also underlines the need to control for common factors to properly identify contagion.

IDENTIFYING SOURCES OF COMMON SHOCKS

A large number of variables could potentially be related to measuring common shocks across banks. Faced with this problem (and the need to be parsimonious in the estimations), a factor model was constructed to extract common components between the number of coexceedances in a country, industry sector shocks that could affect the credit portfolios of more than one bank, and standard macroeconomic variables (see Box A.1). In all, two domestic and one euro area factor were used in the estimation. This procedure provides explanatory variables which should capture the correlation of the coexceedances with common shocks and thus ultimately allow for the identification of banks' tail events that are due to contagion.

Charts A.2-A.4 show the correlations of the underlying variables with the common factors (factor loadings). The first factor seems to represent overall macroeconomic conditions, as there is a high correlation of this factor with GDP growth and inflation, and a rather high correlation with the steepness of the yield curve. Conversely, correlations between the industry risk measure and coexceedances is typically

5 Data in Chart A.1 correspond closely to the idea of "assets at risk" as a financial fragility indicator, as sketched in Gropp, R. (2004), *"Bank Market Discipline and Indicators of Banking System Risk: The European Evidence"*, in: Borio et al., Market Discipline across Countries and Industries, MIT Press, Cambridge, pp. 101-17. However, it should be noted that there the measure was the share of assets at or below a certain level of the distance-to-default.

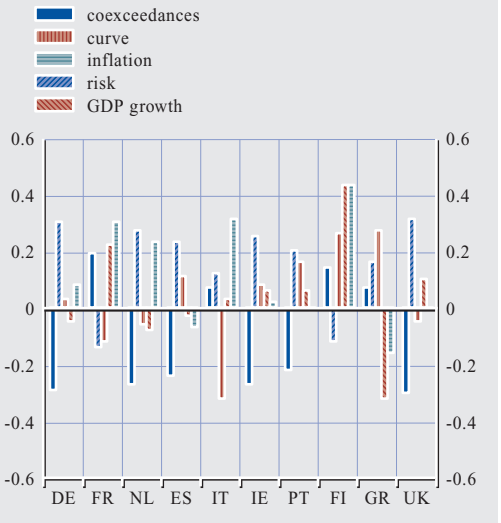
Box A.1 Methodology

The estimation procedure underlying the results reported in this special topic is detailed in Gropp and Vesala (2004 op. cit.). A two-step procedure was used. In the first stage, the common variance of coexceedances, sector risk, inflation rates, GDP growth rates and the steepness of the yield curve was extracted for each country, using standard factor models. Generally two factors were retained for each country, which tended to account for close to 100% of the common variance. The same approach was then used to extract the common variance between the (national) coexceedances, euro area GDP, euro area inflation rates, the euro area yield curve and euro area sectoral risk to obtain one euro area factor. In the second stage, given that the dependent variable is discrete, an ordered logit model was estimated. The model explains the number of banks in the tail simultaneously (i.e. the coexceedances) in one country, with the two domestic factors, the euro area factor, common factors for the corresponding other country, and the number of coexceedances lagged by one period in the other country. Furthermore, in order to ascertain the effect of being part of the common currency and sharing an interbank market, contagion variables were also split into pre and post-euro variables.

low. The second factor seems to represent the common credit risk components stemming from industry sector conditions and the co-movement in coexceedances. Only in a few countries does the second factor also correlate significantly with the macro variables. Finally, the euro area factor seems to capture the co-movement across all variables.

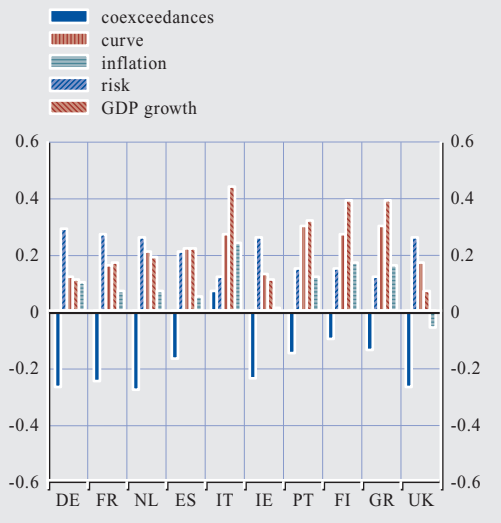
Given that common factors explaining banking fragility have been identified, the next step is to analyse whether the number of banks experiencing large shocks in another country adds explanatory power. Hence, in addition to the common factors, the number of coexceedances in one country (lagged by one period) were included. It should be noted that the direction of contagion can be identified, i.e. whether it is

Chart A.3 Correlation of the underlying variables with common factors (factor loadings), domestic factor 2



Source: ECB.

Chart A.4 Correlation of the underlying variables with common factors (factor loadings), euro area factor



Source: ECB.

stronger from country A to country B and vice versa, not just its presence.

CONTAGION RISK AMONG MAJOR EU COUNTRY BANKING SYSTEMS

The results suggest that coexceedances (widespread bank fragility) result from common shocks and contagion. The domestic common factors and the euro area factor are generally very important in explaining banking fragility. It is found that quite often the foreign common factors are also important in explaining coexceedances and, hence, domestic banking fragility. One possible interpretation is that banks are directly exposed not only to domestic and European conditions, but also to specific conditions in other European countries, e.g. by way of subsidiaries or branches.

Even though the model using only common factors tends to explain a very high proportion of coexceedances (R^2 in excess of 0.5), the contagion variable also tends to be highly statistically significant among most large EU countries. For the entire sample period (1996-2003) there is evidence of strong contagion risk between the major EU countries. In contrast, when considering contagion to and from smaller countries of the EU, essentially no contagion risk was found. A number of interpretations for this finding are possible. First, as these countries are small, their banks may be simply not large enough to lead to contagion in other countries, although this explanation would suggest that there should be contagion from large countries to smaller countries, which is not the case. Second, the interbank exposure of banks in these countries may be much lower than in other banks in the EU. It seems likely that the finding is explained by a combination of both of these factors.

The patterns of contagion risk were examined also for the period before and after the introduction of the common currency. Some increase in contagion risk after the introduction of the euro was found. Contagion links across large countries in particular seemed to become stronger in the post-euro period, and the estimates for the entire sample period seem to be dominated by post-euro contagion risk. However, it would be premature to attribute the increase in contagion risk to the introduction of the common currency for two reasons. First, a complementary study using multivariate extreme value theory suggests that contagion risk may have increased well before the introduction of the euro (around 1995-97) and may have increased in the US banking system as well.[6] Second, contagion risk from the UK also increased in the post-euro period (but not contagion to the UK from euro area banking systems) and, hence, it is difficult to attribute the increase in contagion solely to the integration of euro area money markets.

All of these conclusions are based on conditional probabilities, meaning that the likelihood of this occurring is extremely low. Nevertheless, it can be concluded that, given a sizeable shock to the banking sector of a large EU country, the consequences may very well be felt in the in other EU countries. In addition, the non-linearity of the conditional probability curves suggests that the severity of contagion risk increases rapidly and disproportionally when the number of foreign banks experiencing simultaneous shocks increases.

Banks' exposures to each other in the interbank money market can be a major (although certainly not the only) channel for the spread of contagion. Overall there is significant correlation between the importance of the particular interbank asset or liability linkages by country pairs (according to ECB data) and the estimated contagion risk. However, the results far from exclude other reasons for the identified patterns of contagion, and it would be incorrect to conclude that interbank exposures are the only relevant source of contagion. For example, banks' exposure to financial centres (i.e. Frankfurt or London) and to financial markets more generally may be an

6 Hartmann, P., S. Straetmans and C. de Vries (2004), *"Banking System Stability: A Cross-Atlantic Perspective"*, paper prepared for the NBER conference on "Risks to Financial Institutions and to the Financial Sector", Woodstock, VT, 20-21 October.

additional important channel for the spread of shocks among banks.

CONCLUSION

In this special feature, cross-border contagion risk in Europe was analysed by modelling banks' default risk using the stock market-based distance-to-default, with large changes in this measure reflecting major shocks in banks' financial condition. It is argued that contagion risk can be identified when the incidence of such tail events is significantly influenced by a lagged measure of coexceedances of banks from another country. To distinguish between common shocks affecting more than one bank and contagion, a factor model was used to extract common factors between coexceedances, sector risk and macro variables.

Overall, the evidence supports the existence of some cross-border contagion risk among the large EU countries. Cross-border contagion was found to be a significant and economically relevant factor in explaining bank fragility, controlling for macroeconomic and other factors. Given the caveat that the results are based on a new empirical methodology and, hence, should be further scrutinised, they tend to suggest an important pan-European dimension in the monitoring of systemic risk.

B GROWTH OF THE HEDGE FUND INDUSTRY: FINANCIAL STABILITY ISSUES

INTRODUCTION

After the near-collapse of LTCM in September 1998, recently hedge funds have again started to capture the attention of financial stability watchers. However, this time the renewed interest is motivated by their impressive growth and increasing proliferation as a mainstream alternative investment vehicle.

The term "hedge fund" has a historical background, as the first institutions of this kind were engaged in the buying and short-selling of equities with the aim of eliminating (hedging) the risk of market-wide fluctuations. Since then hedge funds have started to use a wide variety of other investment strategies that do not necessarily involve hedging. In contrast to other pooled investment vehicles, hedge funds do not have any restrictions on the type of instruments or strategies they can use, owing to their unregulated or lightly regulated nature. A hedge fund can be defined as a fund whose managers receive performance-related fees and can freely use, and do use, various active investment strategies to achieve positive absolute returns, involving any combination of financial leverage, long and short positions in securities, derivatives or any other assets in a wide range of markets. A summary of some key hedge fund characteristics is presented in Table B.1, which demonstrates that hedge funds represent a flexible business model rather than an alternative asset class.

Table B.1 Hedge fund characteristics

Return objective	Positive absolute returns under all market conditions, without regard to a particular benchmark. Usually managers also commit their own money; therefore, the preservation of capital is very important.
Investment strategies	Position-taking in a wide range of markets. Free to choose various investment techniques, including short-selling, financial leverage and derivatives.
Incentive structure	1-2% management fee and 15-25% performance fee. Quite often high watermarks apply (i.e. performance fees are paid only if cumulative performance recovers any past shortfalls) and/or a certain hurdle rate must be exceeded before managers may receive any incentive allocation.
Subscription/Withdrawal	Predefined schedule with quarterly or monthly subscription and redemption. Lock-up periods for up to 1 year until first redemption. Some hedge funds retain the right to suspend redemptions under exceptional circumstances.
Domicile	Offshore financial centres with low tax and regulatory regimes, and some other onshore financial centres.
Legal structure	Private investment partnership that provides pass-through tax treatment or offshore investment corporation. Master-feeder structure may be used for investors with different tax status, where investors choose appropriate onshore or offshore feeder funds pooled into a master fund.
Managers	May or may not be registered or regulated by financial supervisors. Managers serve as general partners in private partnership agreements.
Investor base	High net worth individuals and institutional investors. High minimum investment levels. Not widely available to the public. Securities issued take the form of private placements.
Regulation	Generally minimal or no regulatory oversight due to their offshore residence or "light touch" approach by onshore regulators; exempt from many investor protection and disclosure requirements.
Disclosure	Voluntary or very limited disclosure requirements in comparison with registered investment funds.

HEDGE FUND STRATEGIES

A hedge fund's investment style is more important to its risk-return profile than asset class selection or sector/geographic orientation (see Table B.2). *Directional* hedge funds generally offer high returns commensurate to the high risks and leverage involved. Macro hedge funds are the most prominent example of this investment style. Such funds follow a "top-down" approach and try to profit from major economic trends or events. Emerging markets and other directional hedge funds with a regional focus, by contrast, favour a "bottom-up" approach, i.e. they tend to be asset pickers in certain markets and look for inefficiencies in developing markets.

In contrast to directional funds, *market neutral* hedge funds search for relative value or arbitrage opportunities to exploit various price discrepancies, and try to avoid exposure

Table B.2 Hedge fund strategies

Directional	Long/short equity hedge, dedicated short bias, global macro, emerging markets, managed futures.
Event driven	Merger arbitrage, distressed/high-yield securities, regulation D.
Market neutral	Fixed income arbitrage, convertible arbitrage, equity market neutral.
Multi-strategy	
Fund of funds	

Source: CSFB/Tremont Index.

to market-wide movements. Such strategies are attractive owing to their lower volatility, but they require medium to high leverage in order to benefit from small pricing distortions, particularly in fixed income markets.

Event driven strategies lie somewhere in the middle of the volatility spectrum, with corresponding medium volatility and low to medium leverage. Profit opportunities arise from special situations in a company's life, such as mergers and acquisitions, reorganisations or bankruptcies. Merger arbitrage involves buying the shares of a target company and selling the shares of the acquiring company. Hedge funds investing in distressed securities try to exploit the fact that it is difficult to value such securities, and that institutional investors are prohibited from investing in them.

Finally, *funds of hedge funds* (FOHFs) should have lower volatility and attractive risk-adjusted returns due to diversification benefits.

THE HEDGE FUND INDUSTRY

For a long time, hedge funds were predominantly *domiciled* offshore, as managers were looking for minimum regulatory intervention and favourable tax treatment. However, owing to investor demand and a "light touch" approach by some onshore regulators, new hedge funds have started to consider onshore jurisdictions to govern their operations. In contrast to hedge funds, their *managers* generally reside in major financial centres and may or may not be registered with local regulatory authorities. Sometimes they are required to register because they also manage regulated funds or they do so to enhance their credibility in the eyes of investors.

Prime brokers are banks or securities firms offering brokerage and other professional services to hedge funds and other large institutional clients.[1] For new hedge funds, capital introduction services, whereby prime brokers introduce managers to potential investors, may be particularly vital.

Until this decade, high net worth individuals were the dominant source of funds for hedge funds (see Chart B.1) and this fact, notwithstanding the LTCM debacle, diluted concerns about the systemic importance of hedge funds. However, the growing level of knowledge about hedge fund products and their risk-adjusted diversification properties has also prompted demand from institutional investors. The recent low interest rate environment and the associated hunt for yield have also contributed to this evolution. Furthermore, pension funds seem to be showing more interest than insurance companies, at least in Europe.

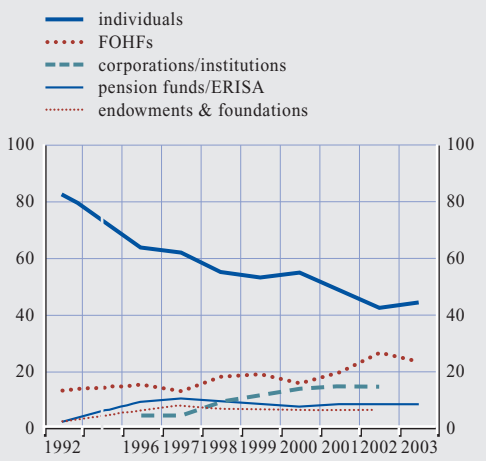
Most hedge funds are relatively small: the great majority have less than USD 100 million of capital under management, while more than one-third have even less than USD 25 million. There is no conclusive evidence on whether size matters for hedge fund returns, although there are indications that smaller hedge funds seem to outperform larger ones, while mid-sized funds lag both other groups. This suggests the phenomenon of a "mid-life crisis" affecting hedge fund managers which is related to the growth of their capital under management.[2] The link, of course, may vary depending on the hedge fund strategy, and macro hedge funds do seem to be an exception.

1 Prime brokerage services involve the clearing and settlement of trades, custodial services, record-keeping, financing, access to research and consulting services, risk management and operational support facilities.

2 See Hedges, J.R. (2004), *"Size vs. Performance in the Hedge Fund Industry"*, Journal of Financial Transformation, Vol. 10, Capco Institute, April.

Chart B.1 Hedge fund investors

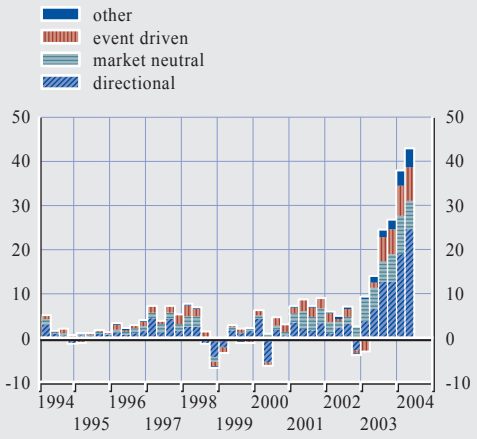
(% of capital under management)



Sources: Hennessee Group (2003, 2004) and International Financial Services (2004).

Chart B.2 Hedge fund inflows

(USD billions)



Source: TASS Research.
Note: Excluding FOHFs.

In an environment of low interest rates and low returns in financial markets, investors have been searching for alternative investments to improve risk-adjusted returns, which makes hedge funds a natural candidate. All data sources confirm strong growth in the number of hedge funds and capital under management (see Chart B.2). The latest estimates of the total capital under management are close to USD 1 trillion.

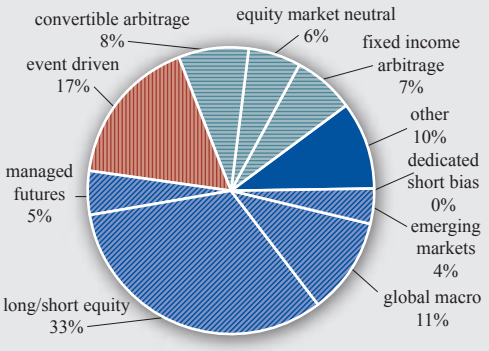
From 1993 onwards, hedge fund capital under management has been growing at an annualised compound growth rate of 26%. The LTCM episode seriously shook the industry, but proved to be only a temporary setback to an accelerating long-term trend.

Investors bring in new funds mainly on the assumption that past returns will continue to be realised. The more recent, relatively mediocre performance of hedge funds raises the question whether they will be able to maintain their impressive historical track record as the number of new hedge funds increases, especially as many of them may end up trying to exploit the same market opportunities.

The role of FOHFs is increasing and they should provide investors with an additional layer of due diligence. However, there is little evidence as to how effectively they perform this task and how well they are diversified. FOHFs are the

Chart B.3 Hedge fund capital structure by strategy

(June 2004, % of capital under management)



Source: TASS Research.
Note: Excluding FOHFs.

main vehicle for the "retailisation" of hedge fund industry, and in some European countries only FOHFs are allowed for public offering. There are some concerns that retail investors fail to realise or are not informed properly that FOHF fees are levied on top of the fees charged by underlying hedge funds, which can have a significant impact on final FOHF returns.

The current trend is that smaller hedge funds with less than USD 100 million under management usually obtain funds from FOHFs, while the larger ones with USD 1 billion take money directly from institutional investors.[3]

The hedge fund industry is also becoming increasingly institutionalised. Banks are setting up hedge funds under their own brand names in order to offer investors the full spectrum of available traditional and alternative investments. They are also seeking to participate in what might prove to be a structural change in the asset management industry. Lured by high performance fees, many talented bankers and traditional fund managers are leaving for hedge funds. Investment banks have reacted to this "brain drain" by setting up in-house hedge funds and by offering more attractive compensation schemes to their staff. The size of assets managed by traditional financial institutions continues to be higher than those of hedge funds by a very large margin. It is therefore important that this evolution does not hamper the stability and the financial intermediation of the traditional fund management business.

FINANCIAL STABILITY IMPLICATIONS

Possible positive effects

The overall size of hedge funds is still relatively limited, but their active role in markets makes them much more important than their size alone. The input of hedge funds is very significant, as they often take alternative market views, can leverage their positions, and change their portfolio composition much more frequently than traditional funds. They thrive on perceived inefficiencies by arbitraging away price differences for the same risk across markets. In this way, hedge funds contribute to the price discovery process.

Hedge funds also tend to be risk-takers in a number of markets. This is especially the case in fledgling and sophisticated markets, where risks are more difficult to quantify and hedge fund managers have a competitive edge because of their superior models. The credit derivatives market is just one example of such a market.[4] More regulated financial institutions are usually reluctant to be exposed to such risks and prefer to earn fees or other types of income with lower risks. The presence of hedge funds as active market participants contributes to the development and liquidity of new specialised OTC markets, leads to the development of better risk management tools, and enhances the spreading of risks among market participants.

It has been argued that hedge funds' activity may lead to lower market volatility because they are less likely to engage in "momentum trading" (i.e. buying into a rising market and selling into a falling one) and impose longer redemption horizons on their investors. Another element that may support this argument is that they are willing to put their capital at risk in volatile market conditions so that market shocks can be absorbed. By taking contrarian approaches and demonstrating their ability to engage in short-selling, they may also act as a counterbalance to market herding. In addition, hedge funds seem to provide attractive diversification benefits. Correlations of monthly returns between major stock market indices and dedicated short bias or managed futures strategies can even be negative.

The case for the inclusion of hedge funds in an investor's portfolio becomes even more compelling when historical risk-adjusted returns are taken into account. Thus, new

3 Barclays Capital (2003), *"Observations on the Rapid Growth of the Hedge Fund Industry"*, December.

4 According to the British Bankers' Association, hedge funds' share as sellers in the credit derivatives market has surged from 5% in 2001 to 15% in 2003, while their share as buyer has risen from 12% to 16%.

combinations in the risk-return space can be achieved with hedge funds, thereby increasing the completeness of financial markets. This should ultimately also result in a higher degree of social welfare. However, the evidence that hedge funds outperform the market is not yet conclusive, as there are many reservations with respect to the accuracy of hedge fund indices and the sensitivity of comparisons to the choice of the sample period. Moreover, reported returns could be smoother than true economic returns, owing to possible higher illiquid exposures and the less frequent pricing of these exposures.[5]

Leverage and liquidity risks of hedge funds

The near-collapse of LTCM underscores how hedge fund activities can harm financial institutions and markets. A sequence of negative events can start with losses on leveraged market positions. Liquidity shortages then come into play, which are further exacerbated by asset illiquidity in stressed markets. Thus, leveraged market risk can, if not supported by adequate liquidity reserves or borrowing capacity, force a fund to default on its obligations to prime brokers and other financial institutions. The spillover effect on markets depends on the fund's size and the relative importance of its positions in certain markets. A sequence of negative events can also be triggered by mass exits from markets where hedge funds and proprietary trading desks of large banks have taken relatively similar positions. The concentrations, linkages and spillover effects can ultimately lead to a systemic crisis.

Hedge funds obtain leverage in a number of ways, but they typically prefer derivatives and other arrangements, where positions are established by posting margins rather than the full face value of a position. Repurchase agreements and short sales are also quite popular techniques. Direct credit in the form of loans is rather uncommon, but credit lines for liquidity purposes are widely used.

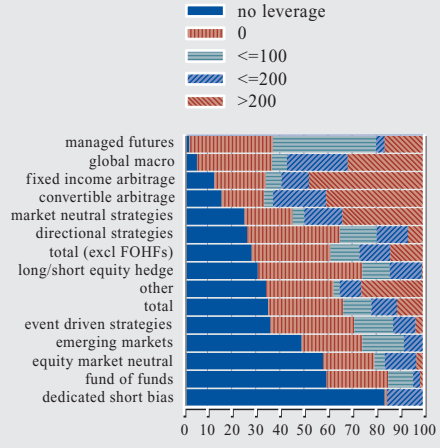
Accounting-based balance sheet measures of leverage fail to reflect the risk of the assets. Risk-based measures alleviate this shortcoming by relating market risk to the capacity to absorb it. However, risk-based leverage measures, even adjusted for potential asset illiquidity, do not capture the funding liquidity risks arising from margin calls, redemptions or financing mismatches. The LTCM episode has clearly underscored the role of funding liquidity in escalating the effects of otherwise acceptable losses on market positions. Hence, leveraged market risk should be evaluated in conjunction with the liquidity risk stemming from asset illiquidity and funding risks.

Two market neutral strategies, fixed income arbitrage and convertible arbitrage, tend indeed to have the highest leverage (see Chart B.4), although the degree of leverage in the equity market neutral strategy is one of the lowest. Managed futures and global macro funds are also highly leveraged, as both strategies rely extensively on derivatives to acquire the desired exposures. As a rule, FOHFs do not seem to be highly leveraged, although some do use leverage

5 Getmansky, M., A. W. Lo and I. Makarov (2003), *"Serial Correlation and Illiquidity in Hedge Fund Returns"*, April.

Chart B.4 Hedge fund leverage by strategy

(distribution of average leverage, % of capital under management)



Source: TASS database.
Note: Only funds with reported (estimated) capital under management in June 2004 are included.

in excess of 200. FOHF products with capital protection are quite popular among risk-averse institutional investors, but the design of such products[6] also implies that the FOHF will have to employ leverage to achieve targeted returns.

Leverage seems to vary greatly by hedge fund size, and the largest hedge funds with more than USD 1 billion of capital under management tend to exhibit higher levels of leverage. In the latter group, the share of hedge fund capital with a leverage factor of more than 200 is 19% – the highest among all size groups (see Chart B.5).

Analysis of the average leverage among active funds with different vintage (inception) years might provide some insight into the evolution of leverage. Interestingly, older funds tend to be more leveraged than younger ones (see Chart B.6), providing some support to the view that leverage across the hedge fund industry has probably declined and is presently lower than at the time of the near-failure of LTCM. If this prevalent view is correct, then there seems to be lower potential for the forced liquidation of hedge fund positions in times of stress. However, analysis of a possible market impact should also incorporate the leverage and positions of proprietary trading desks of regulated banks and securities firms, since they may adopt "hedge fund"-like strategies.

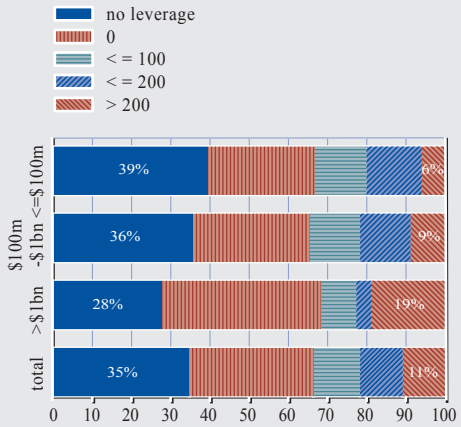
It remains unclear whether hedge funds with less liquid investments take appropriate prudent protective measures. These could, for example, include less frequent redemptions, lengthier lock-up periods, higher liquidity reserves or credit lines for unforeseen liquidity shortages.

Market risk, leverage and liquidity risks may interact among each other, so a vulnerability analysis should ideally seek to identify possible combinations and concentrations of high volatility, high leverage, higher funding risks and larger hedge fund size.

6 For example, 60% of attracted capital is invested in zero coupon bonds maturing after 10-12 years and the remaining 40% invested in underlying hedge funds. An investor is guaranteed to receive 100% of the initial investment, provided the investment is held until the maturity of the zero coupon bonds. However, 40% of the initial investment has to be invested in a way that could earn 8-12% on the 100% of initial investment; therefore, the use of leverage is inevitable.

Chart B.5 Hedge fund leverage by size

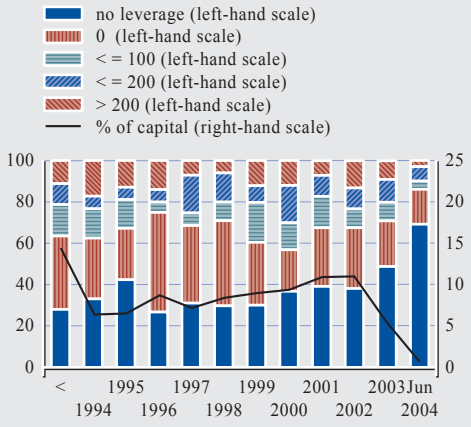
(distribution of average leverage, % of capital under management)



Source: TASS database.
Note: Only funds with reported (estimated) capital under management in June 2004 are included.

Chart B.6 Hedge fund leverage and capital by vintage year

(distribution of average leverage, % of capital under management)



Source: TASS database.
Note: Only funds with reported (estimated) capital under management in June 2004 are included.

There are concerns that recent mediocre performance may encourage hedge fund managers to employ greater leverage or more aggressive strategies. After poor performance, capital might flow out so that hedge funds would be forced to liquidate positions. This could lead to a market-wide disinvestment spiral, potentially resulting in systemic risk.

A number of mitigating factors are however also at play. Institutional investors and FOHFs, which already account for half of the capital managed by hedge funds, should have a better understanding of hedge fund operations. Hence, they may be more patient when confronted with temporary underperformance. Moreover, lengthy lock-up periods and less frequent redemption schedules should provide more time for hedge funds to recoup past shortfalls and settle their liabilities.[7]

Impact on credit institutions

Direct credit exposures of credit institutions and securities firms (prime brokers) to hedge funds are the most obvious channel whereby hedge funds could affect the robustness of the financial system. Prime brokers provide leverage, issue credit lines and have trading exposures to hedge funds in OTC and other markets. Other types of direct exposures include income flow from prime brokerage services and direct market risk exposure, as banks invest their own money into hedge funds.

Little information on direct exposures is available to substantiate the impact of hedge funds to prime brokers. Publicly available information provided by prime brokers is very limited, although improved disclosure by financial institutions with regard to their dealings with hedge funds was one of the most important recommendations made after the LTCM crisis.[8] Better transparency was and still is seen as the main instrument to make market discipline effective and prevent future systemic disruptions.

A very rough indication of banks' direct exposures towards hedge funds can be obtained by examining BIS data on consolidated international bank claims on private non-bank borrowers in offshore centres. These exposures have been growing approximately in line with the growth of the hedge fund industry.

Some of the largest prime brokers appear very dependent on the income stream from prime brokerage services to hedge funds. In some cases, such income is reported to make up 25-40% of trading and commission income.[9] Tight competition reportedly led in 2003 to a reduction in the market shares of the two largest prime brokers.[10] Some prime brokers are more concentrated in a few hedge fund strategies and may therefore be more vulnerable to certain types of disruptions in certain markets. Strong competition sometimes also results in a situation whereby prime brokers have to provide seed capital in order to establish a prime brokerage relationship. However, such investments can also improve the prime broker's own profitability via higher returns and lucrative hedge fund management fees. Furthermore, there are some signs that tight competition has an impact on the terms of bank credit to hedge funds. Credit has become more available and hedge funds can negotiate better access to credit, both for their regular business and for unexpected liquidity shortages. Established prime brokers have also indicated that there has been some erosion in credit standards by new entrants to the prime brokerage business.

However, risk management practices, particularly the management of counterparty risk, have

7 However, the proliferation of FOHFs, which generally provide the possibility of monthly redemption, could mean that more flexible redemption profiles may be demanded from the underlying hedge funds. Thus, the hedge fund industry may risk losing one of its defensive features.

8 US President's Working Group on Financial Markets (1999), *"Hedge Funds, Leverage, and the Lessons of Long-Term Capital Management"*, April.

9 The prime brokerage business is highly concentrated. Two firms, Morgan Stanley and Goldman Sachs, control more than 40% of total client assets. Other prime brokers in the global top ten, which includes two EU15 and two Swiss banks, clearly lag behind the two leaders.

10 EuroHedge (2004), *"Chasing Pack Continue to Close Gap on the Big Two"*, March, pp. 19-21.

improved significantly since the near-collapse of LTCM. Most exposures to hedge funds are collateralised and the largest banks make extensive use of VaR measures and stress tests to quantify potential future credit exposures and to protect them from an LTCM-type scenario or other extreme events. The information flow from hedge funds to banks has also probably improved. Prime brokers seem to think that the combination of greater transparency and collateral enables them to manage hedge fund-related risks properly. Nevertheless, there are risks that in a highly competitive environment, risk management standards will be lowered to an inadequate level. Since the prime brokerage business is quite concentrated, it should be relatively easier for supervisors to monitor their activities and to detect any substantial erosion of risk management standards.

Hedge funds, particularly the larger ones, prefer to use more than one prime broker to diversify and protect their proprietary trading strategies. Rapidly evolving needs and incentives provided by prime brokers can nevertheless induce them to rely on the services of just one prime broker. However, credit providers mostly do not have full daily information on the positions and risks faced by hedge funds.

Apart from direct risks, banks and securities firms face a number of indirect risks stemming from hedge fund activities. Indirect credit risk may arise because of credit risk from counterparties with large exposures to hedge funds. Moreover, the value of market positions in prime broker portfolios may be adversely affected by hedge fund actions in financial markets, as discussed in the next sub-section. Finally, prime brokers may lose income from their own asset management business if hedge funds continue to expand. However, banks seem to be taking the threat of hedge funds seriously and are ready to adjust their business strategies accordingly.

Impact on financial markets

Hedge funds employ active, opportunistic and sometimes leveraged trading strategies. They turn their portfolios over far more frequently than traditional funds, so their short-term influence on markets can be larger than the capital under management would indicate. Hedge funds generally prefer liquid and "anonymous" markets, i.e. ones that can be entered and exited swiftly at low cost. Their actions tend to be sporadic and, in contrast to traditional funds, they do not need to be fully invested all the time.

Efforts to estimate the impact of hedge funds on financial markets are hampered by the lack of good data. Past episodes where hedge funds were reportedly involved are numerous, most of which relate to macro hedge funds trying to exploit doubts about the sustainability of unsound macroeconomic policies or probing shaky currency pegs.

Under normal conditions, hedge funds contribute to the liquidity and efficient functioning of financial markets, but in certain cases, especially in small or medium-sized markets, their actions can be destabilising. Concentration information on OTC derivatives and other less transparent markets can provide an early warning signal on the build-up of concentrated positions in certain markets and can alert market participants to the risks involved.

Another question that often arises is whether hedge funds – through their daily activity – stabilise or destabilise financial markets. In this context, two forms of trading can be distinguished: positive and negative feedback trading. The former refers to the buying of financial instruments after price increases, and selling them after price decreases. Such practice can amplify price swings and lead to overshooting or bubbles. Positive feedback or momentum trading can be generated by dynamic hedging, stop-loss orders, similar position-taking by other market participants, forced liquidations related to margin calls or just by simple trend-following strategies. By contrast, negative feedback or contrarian trading can have a stabilising influence on markets.

Intuitively, hedge funds should be more contrarian, as only trading against the crowd can be expected to generate persistent excess profits. However, markets are not completely efficient and trend following can, at times, be lucrative. Managed futures hedge funds (5% of total single hedge fund capital under management, see Chart B.3) are reportedly cited as utilising trend-following approaches, and this is probably the main factor explaining the negative year-to-date performance in rather range-bounded markets. Other directional strategies – global macro (11%), emerging markets (4%), long/short equity (33%) – can be on both sides of the spectrum, while dedicated short sellers (less than 1%) are probably more contrarians. Event driven (17%), market neutral (relative value and arbitrage) (20%) strategies probably also involve the taking of more contrarian views. Hence, it is very difficult to determine whether hedge funds, on average, are momentum traders or contrarians.

Furthermore, there are concerns that as the number of new hedge funds increases, they may be increasingly attempting to exploit the same market opportunities, possibly relying on similar models. The so-called crowding of positions in this way is another form of momentum trading and could have a destabilising impact on both rising and, especially, falling markets. There are indications that certain strategies, such as convertible arbitrage, have reached capacity limits related to market size. Only funds with new ideas or dealing in fledgling sophisticated markets can continue to deliver alpha.[11] According to market reports, the capacity limits of certain strategies or markets makes essentially limitless foreign exchange markets attractive to hedge funds once again.

There are indications, however, that the prevailing concentration in the hedge fund industry is not very high, with currently no hedge fund in the market comparable to the size of LTCM in its heyday. This, together with the fact that there are a larger number of active hedge funds, could also mean that the probability and risks of large crowded trades are lower.

Conventional wisdom suggests that hedge funds thrive in volatile financial markets. This is frequently put forward as a reason for the diminishing returns that have been observed recently in the rather low volatility environment. There is no conclusive evidence on this issue and calculations indicate that over the past ten years, hedge funds have tended on average to perform better when stock markets were less volatile. The correlation coefficients between the annualised S&P 500, Dow Jones EURO STOXX historical monthly volatility and the CSFB/Tremont Hedge Fund Index monthly returns are negative (see Charts B.7 and B.8). The results are similar across almost all hedge fund strategies. Only dedicated short sellers and managed futures funds, which together account for only around 5% of total capital under management, tend to perform better in volatile markets. Thus, although short sellers are more likely to be contrarians, their returns tend to be higher in volatile markets, as volatility is usually higher in falling rather than rising markets.

CONCLUSIONS

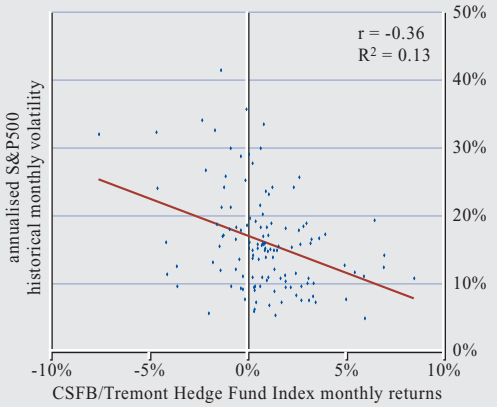
The increasing proliferation of hedge funds as an alternative investment for both institutional and retail investors raises questions about the wider financial stability implications of this form of financial intermediation. Although hedge funds are very much associated with the negative events of the LTCM period, they also have a positive effect on the financial system: they contribute to market liquidity, play an important role in the price discovery process, contribute to the elimination of market inefficiencies, and offer diversification benefits to investors.

The potential threat of hedge funds to credit institutions is mainly the result of their role as prime broker. In this capacity, they provide leverage, issue credit lines and incur trading exposures. Data seem to point to a strong concentration of the prime brokerage

11 Return associated with active asset management. This is also referred to as non-systematic risk or specific risk, as opposed to systemic or overall market risk.

Chart B.7 Hedge fund returns and S&P 500 volatility

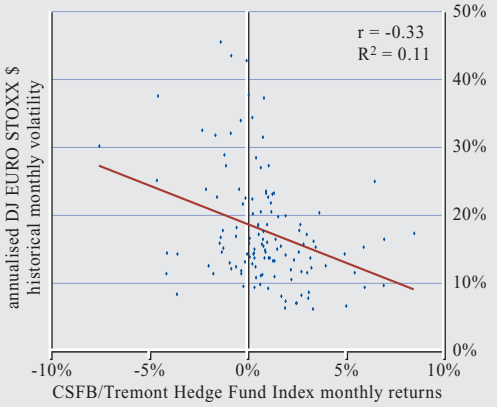
(Jan. 1994 – Oct. 2004)



Source: Bloomberg.

Chart B.8 Hedge fund returns and DJ EURO STOXX volatility

(Jan. 1994 – Oct. 2004; both in USD terms)



Source: Bloomberg.

business with a limited set of important and global market players. It also seems that this business has become increasingly competitive over time, with a number of second-tier players aggressively trying to gain market share. Considerable progress has been made in the further development of risk management standards that address some of the concerns related to exposures to hedge funds. Market data, such as VaR figures, show that a number of large credit institutions (including European ones) are taking on more market risk and engaging in "hedge fund"-like strategies. Under these conditions, negative market events may not only have an impact on the direct relationship between credit institutions and hedge funds (for example, through credit exposures or commission income), but may simultaneously affect the proprietary market positions of credit institutions.

No conclusive evidence on the impact of hedge funds on financial markets exists, but the available information points to a situation which is much less worrisome than at the time of the LTCM crisis. First, as more players have entered the market, positions are much less concentrated in one or a few funds. Second, in general it seems that the leverage levels taken on by funds are now lower. There is a risk, however, that as more money flows into hedge funds and profit opportunities diminish commensurately, some players might take on more risk or leverage to achieve targeted returns. In addition, there is the possibility that hedge funds could engage in "crowded trades", i.e. take similar positions which might lead to market disturbance in case of simultaneous exits.

C SECURITIES SETTLEMENT SYSTEMS AND FINANCIAL STABILITY

INTRODUCTION

Securities settlement systems form an essential part of the financial market infrastructure. If they are badly designed, they may contribute to severe disruption of the functioning of financial markets. Awareness of the importance of securities settlement systems is especially high in Europe, as the European securities settlement infrastructure has been changing rapidly in many ways (see Section 6.2 of this report).

This Special Feature describes the most important reasons why robust securities settlement systems are important for safeguarding financial stability, and states how they should be designed to ensure that they do not contribute to instability in financial markets. The process of securities settlement is briefly described in the next section, while subsequent sections go on to discuss in detail the relationship between securities settlement systems and financial stability.

SECURITIES SETTLEMENT AND SECURITIES SETTLEMENT SYSTEMS

The trading of securities involves the reaching of an agreement between two parties – a buyer and a seller – to exchange securities at an agreed price for other assets, typically money. Trading constitutes an obligation to deliver, but not a delivery process in itself. Securities settlement involves the actual transfer of securities from the seller to the buyer. Put more generally, *securities settlement is the transfer of legal ownership in (or other rights related to) securities from one party to another*. Securities settlement systems are entities that provide securities settlement services.

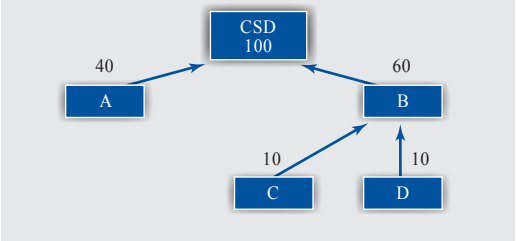
Usually, all shares in a given security are safe-kept for their entire lifetime in a single place, the primary depository for the issue. The security is described as being *immobilised*, as shares are never physically moved from one place to another. The security may still exist in the form of physical papers. However, most securities are *dematerialised*, i.e. they exist only electronically in the form of a computer entry. Many countries have established entities that serve as the primary depository for (almost) all securities issues or for (almost) all issues of certain types of securities (e.g. equities). Such entities are known as *central securities depositories* (CSDs).

In the case of immobilised securities, ownership is usually established in the form of securities account entries.[1] An owner of shares must have a direct or an indirect securities account relation with the CSD or primary depository. In Chart C.1 *A* and *B* have securities accounts directly with the CSD, while *C* and *D* have accounts with *B* and are thus indirectly linked to the CSD. 100 shares of an issue are safe-kept in the CSD; 40 shares are held on *A*'s account with the CSD, and so on. Account holdings oblige the use of a double-booking principle. This means that, for a given issue, the number of shares safe-kept in the CSD must equal the number of shares on accounts with the CSD. Furthermore, the number of shares any entity owns must equal the number of shares the entity holds on accounts with other institutions, minus the number of shares other institutions hold on accounts with the entity. Accordingly, *A* owns 40-0, *B* owns 60-20 and *C* and *D* own 10-0 shares.

Securities settlement now only requires account entries to be changed. If the sender and the receiver of shares both have an account with

1 Sometimes ownership is not established by account entries, but instead by registration in a so-called registrar.

Chart C.1 Securities account relations – an example



the same entity, settlement simply requires that the shares to be transferred are debited from the account of the sender and credited to the account of the receiver. If for example the ownership in 20 shares is to be transferred from *A* to *B* (from *C* to *D*), 20 shares must be debited from *A*'s account with the CSD (*C*'s account with *B*) and credited to *B*'s account with the CSD (*D*'s account with *B*). Settlement becomes more complicated if, for example, the sender (e.g. *A*) has an account with the CSD, whereas the receiver (e.g. *C*) has an account with an intermediary (e.g. *B*) that itself has an account with the primary depository. The shares now have to be debited from the sender's account with the CSD, credited to the intermediary's account with the CSD and credited to the receiver's account with the intermediary.[2]

Entities which, like *B* in the above example, serve as intermediaries between banks and primary depositories such as CSDs, are referred to as custodian banks. Custodian banks and CSDs are the most important settlement service providers in securities markets. Custodian banks, unlike CSDs, usually do not act as the primary depository, but only as intermediaries in the settlement process. Furthermore, again unlike CSDs, they typically provide the full range of banking services and not only settlement services. Table C.1 shows the value of securities held on accounts with the largest custodian banks, while Table C.2 complements this with information on the value of securities held on the accounts of the largest CSDs in the EU.

All in all, securities settlement is by and large based on securities account networks. It is important to note a special characteristic of securities accounts that distinguishes them from cash accounts: securities on securities accounts with a bank (or another entity) are not a liability of the bank. As a consequence, the securities owners do not lose their securities if the bank goes bankrupt, provided that securities settlement is governed by a sound legal basis.

RISKS ORIGINATING FROM PARTICIPANTS IN SETTLEMENT SYSTEMS

Risks to financial stability can originate in the activities or financial condition of participants in settlement systems. Well-designed settlement systems can contribute to mitigating these risks.

For example, one party in a securities transaction, say the buyer, could go bankrupt before settlement so that the transfer of money from the buyer to the seller becomes impossible. If the settlement system transfers the ownership of the securities from the seller to the buyer, then the seller loses up to the full value of the securities (principal risk). If the loss is sufficiently large, the seller may go bankrupt as well, imposing risks – including the possibility of bankruptcy – for creditors of the seller, etc. To avoid contagion effects such as this, settlement systems should settle in delivery versus payment (DVP) mode. DVP means that the settlement system ensures that ownership in securities is transferred from the seller to the buyer if and only if ownership in money is transferred from the buyer to the seller.

It should be noted that the introduction of DVP simply leads to a potential reallocation of claims on a bankrupt bank. Consider the following example with three banks *A*, *B* and *C*. Assume that *B* has liabilities towards *C* of 25 and assets with a value of 10. *A* is not aware of the weak financial situation of *B* and sells securities with a value of 50 to *B*. Without DVP, the settlement system might transfer at settlement day the securities from *A* to *B*. However, since *B* has insufficient funds for the transaction, *A* receives nothing from *B*. *B* will now have assets with a value of 10+50 and liabilities towards *A* of 50 in addition to the liability towards *C* of 25. When *B* is declared bankrupt, *B*'s assets may be divided among the creditors proportionally so that *A* receives 40 and *C* 20. *A* will have lost 10 and *C* 5. However, with DVP, the transaction between *A* and *B* is cancelled, so that *A* loses

2 In a handful of cases, not all shares in a security issue are safe-kept in a single entity, but are instead spread between different places. Settlement may now require the movement of shares, in the form of physical papers, from one place to another.

Table C.1 Custodian banks: assets under custody (USD billions)

Rank	Name	Worldwide Assets	Cross-Border Assets[1]	Domestic Assets[2]	Reference Date
1	State Street	9100	n.a.	n.a.	30/06/2004
2	The Bank of New York	8662	2425	6237	30/06/2004
3	JPMorgan	8014	1897	6117	31/03/2004
4	Citigroup	6640	4405	2235	31/03/2004
5	Mellon Group[2]	2903	763	2140	31/03/2004
6	BNP Paribas Securities Services	2790	2203	587	30/06/2004
7	UBS AG	2398	Na.	n.a.	31/03/2004
8	Northern Trust	2300	824	1476	31/03/2004
9	HSBC Global Investor Services	1572	755	817	31/03/2004
10	Société Générale	1329	784	545	31/03/2004
11	Investors Bank & Trust	1202	196	1006	30/06/2004
12	RBC Global Services	1182	671	511	30/04/2004
13	Credit Suisse Group	1119	n.a.	n.a.	31/03/2004
14	Credit Agricole Group	1010	301	709	30/06/2004
15	Brown Brothers Harriman	1000	708	292	30/06/2004
16	Wachovia	946	7	939	31/03/2004
17	CDC Ixis	623	80	543	01/01/2003
18	Banca Intesa	550	350	200	01/01/2004
19	Nordea Bank	466	79	387	30/09/2004
20	Fortis Bank	450	294	156	31/01/2003
21	UniCredito Italiano SpA	414	271	143	01/01/2004
22	PFPC	400	21	379	01/01/2004
23	Dexia Fund Services	382	382	0	31/07/2004
24	ING	375	n.a.	n.a.	30/09/2003
25	SEB Merchant Banking	340	n.a.	n.a.	30/06/2004
26	KAS BANK	292	107	185	31/03/2004
27	SIS SegaInterSettle AG	242	242	0	01/01/2004

1) Investor and issuer located in different countries.
2) Investor and issuer located in the same country.
Source: Globalcustody.net (2004).

nothing and *C* receives 10, i.e. *B*'s remaining assets. *C* has now lost 15.

Table C.2 EU CSDs: assets under custody (EUR billions)

Name	Country of location	Worldwide assets	Reference date
Euroclear Group		12700	30/06/2004
Of which:			
Euroclear Bank	Belgium	5700	
Euroclear France	France	3700	
CREST	UK	2600	
Euroclear Netherlands	Netherlands	700	
Clearstream International		7300	31/12/2003
Of which:			
Clearstream Luxembourg	Luxembourg	2900	
Clearstream Frankfurt	Germany	4400	
Monte Titoli	Italy	2043	31/12/2003

Source: CSD homepages.

As this example shows, DVP reduces the losses that trading partners (bank *A*) with a bank may incur if the bank (bank *B*) goes bankrupt. But it increases the potential losses of the bank's other creditors (bank *C*), as they will have to bear the losses the trading partners would have incurred without DVP. However, the other creditors might in general be better prepared to cope with such losses than the trading partners of the bank. Trading partners are exposed to risks only for a short period, the time between the execution and the settlement of the trade. They may therefore consider costly risk management measures unnecessary. The other creditors often give longer-term credit so that risk mitigation measures seem more appropriate. If this were not the case, DVP would not necessarily reduce contagion risk.[3]

3 DVP not only reduces the risk of contagion, it also increases the readiness to trade as it protects trading parties against losses. As a result, DVP markets more liquid and thus more efficient.

Today, all CSDs in the EU offer internal settlement in DVP mode. Custodian banks, however, typically do not settle in DVP mode. Instead, they guarantee successful settlement and thus bear the risks themselves, arguing that they, as banks, are able to apply appropriate risk management measures to reduce their own risk exposure.

DVP does not address all systemically relevant risks. If, for instance, the seller in a securities transaction is unable to fulfil a delivery obligation at settlement day on account of not having the securities, DVP settlement is postponed and may be cancelled entirely after a certain time. Before this happens, the buyer however may have already sold on the securities to a third party, who also may then be unable to fulfil a delivery obligation in time, etc. To help avoid this type of contagion effect, CSDs often organise securities lending programmes. If a participant in the CSD has an uncovered delivery obligation, this participant will automatically receive a securities loan from another participant against collateral.

Related problems may arise if the CSD uses so-called multilateral netting. In the most common type of multilateral netting, multilateral cash netting, transactions are not settled one after another. Instead, many transactions between various participants are collected and net cash positions are calculated for each one. Then, only the net cash positions are transferred from one participant to another. If, for example, bank *A* sells securities to bank *B* for EUR 50 and to bank *C* for EUR 20, while *C* sells securities to *B* for EUR 10, *A*'s net cash position is +70, *B*'s position is –60 and *C*'s position is –10. EUR 60 must be transferred from *B* to *A* and EUR 10 from *C* to *A*. If, for example, *C* does not have enough liquidity to settle its cash obligation of EUR 10, it is not possible to settle the calculated position. The calculations are obsolete and must be unwound. This means that new calculations must be carried out from which the transaction between *C* and *B* is excluded. This may substantially delay the settlement of all transactions and thus give rise to contagion effects that could disrupt the financial market. CSDs can avoid or strictly minimise unwinding risks if they calculate (net and gross) positions under the constraint that they have to be covered.

Finally, disruption can occur if the settlement system transfers the ownership of securities to the wrong party because a participant has sent incorrect instructions to the system. CSDs can help to mitigate the consequences of such errors if they ask for instructions from both parties, the sender and the receiver, and only transfer assets if there is clearly no mismatch between the two sets of instructions.

RISKS ORIGINATING FROM THE SETTLEMENT SYSTEM ITSELF

Risks to financial stability can also have their origin in the activities of or the financial condition of the settlement system itself, for the simple reason that many settlement systems, especially CSDs, but also large custodian banks, are systemically important. Large parts of financial markets often rely on a single settlement system. If this system does not operate properly or breaks down completely, the disruption can be significant.

A major concern in this respect is a system's operational reliability. The probability that a system will face technical problems should, of course, be minimised. For example, the capacity of the system should be high enough to cope with peak volumes. However, as technical problems can still occur, it is especially important to limit any adverse impacts. To avoid loss of information, the system should frequently make data backups. After a technical breakdown, perhaps resulting from a disaster such as a terrorist attack, it should be possible to continue business as normal, resuming operations from a second site.

Another concern is the financial soundness of the settlement system. Most CSDs are prohibited by the authorities from granting credit. However, some do grant (secured and

unsecured) credit to their participants, especially the two international CSDs, Euroclear Bank and Clearstream Banking Luxembourg. They do this mainly to assist participants in covering otherwise uncovered settlement obligations, so that the contagion effects described in the previous section can be avoided. On the other hand, if participants default on such credits, the settlement system itself could run into difficulty. For this reason, central banks and regulators argue that CSDs should only grant unsecured credit to a very limited extent and should generally put in place rigorous risk control measures to mitigate credit risk.

Custodian banks grant credit to an even larger extent than CSDs, as the former carry out their normal banking business in addition to their settlement business. *A* default of a custodian bank may therefore seem to be more likely than a default of a CSD. On the other hand, the impact of a default of a custodian bank may be less severe, as one custodian bank may relatively easily take over the custody business of another. Furthermore, the settlement business of CSDs does not rely on custodian banks, whereas custodian banks rely on settlement services provided by CSDs as CSDs are essential as primary depositories (see Chart C.1).

Finally, human error in settlement systems can lead to incorrect transfers or losses of securities followed by contagion effects. Dematerialisation of securities, automation of procedures and double-checking might help to avoid such problems.

RISKS ORIGINATING FROM OTHER SOURCES

Another source of risks is the system used for communication between the settlement system and its participants or between different settlement systems. If communication is disrupted, then settlement – and with it large parts of the financial markets – can be disrupted. The communication system must therefore be reliable. Additionally, the settlement system should have alternative communication systems available in case one system cannot be used.

Finally, securities settlement must be based on a sound legal basis. Legal uncertainty, especially in times of crisis, could cause or magnify problems with a systemic impact.

CONCLUDING REMARKS

By late 2004, very few incidents with a significant systemic impact had been reported in the EU securities settlement industry. The significant systemic impact that such incidents may have strengthens the keen awareness among central banks, regulators and the market that settlement systems are crucial for the functioning of financial markets. All have constantly pressed for improvements when needed. At least in the case of CSDs in the EU, DVP settlement, securities lending programmes, arrangements to avoid unwinding in net settlement and facilities to improve operational reliability are commonly in place. Overall, the risk that financial instability could be caused by or spread through settlement systems seems to be limited.

D THE COMPREHENSIVE APPROACH OF BASEL II

INTRODUCTION

On 26 June 2004, the central bank governors and the heads of banking supervisory authorities of the G10 countries endorsed the Revised Framework for Capital Measurement and Capital Standards, commonly known as Basel II or the New Accord.

Basel II is the culmination of a highly challenging project that was carried out by the Basel Committee on Banking Supervision (BCBS)[1] and its member agencies over a period lasting more than five years. Following the publication of the first round of proposals in June 1999, two additional consultative packages were circulated in 2001 and 2003 for comments, involving industry representatives, supervisory agencies, central banks and other observers in all member countries.

For many countries the next step will be the implementation of the Revised Framework by the end of 2006, according to the timetable developed by the BCBS. The deadline for the implementation of the most advanced approaches to risk measurement foreseen by the new framework is the end of 2007.[2]

This Special Feature provides an overview of the comprehensive approach of the New Accord, placing emphasis on the innovative elements of Basel II and relevant aspects from a financial stability perspective. It concludes with an assessment of the key remaining challenges for a successful implementation of the New Accord.

THE INNOVATIVE ELEMENTS OF THE NEW ACCORD

FROM THE 1988 CAPITAL ACCORD TO BASEL II

Basel II builds on the first Capital Accord published by the BCBS in 1988, which set out the first internationally accepted definition of bank capital and a credit risk measurement framework.

The regime established by the 1988 Capital Accord is based on a simple standard requirement, according to which internationally active banks in the G10 countries must hold capital to cover at least 8% of a basket of assets measured in different ways according to their riskiness. The categorisation of assets in this way leads to risk-weighted assets (RWA). This categorisation is applied to measure default risk, with assets being ranked in four risk weight buckets (0%, 20%, 50% and 100%) according to the debtor category. The 0% risk weighting applies essentially to bank holdings of government assets, while claims on banks have a 20% weight. Within each category, this approach does not distinguish between potential differences in the creditworthiness of each individual borrower.

Over time, however, the simple rule-based methodology of the 1988 Capital Accord became unable to address adequately the increasing complexity and associated risks of the evolving banking industry. Therefore, despite the significant contribution that the Capital Accord had made to the development of the single market in the EU and the high prudential standards that it had set, a revised framework was designed, allowing for a more accurate alignment of regulatory capital with the underlying risks that international banks face.

The New Accord is specifically designed to cope with the major shortcomings of the current regulatory regime. These include: i) crude estimates of credit risks; ii) scope for capital arbitrage; iii) lack of recognition of effective credit risk mitigation; iv) incompleteness

1 The BCBS was established at the BIS in 1974 and comprises central banks and other banking supervisory authorities from the G10 countries, Spain, Switzerland and Luxembourg. The Committee represents a standard-setting body on all aspects of banking supervision and provides a forum for regular cooperation.

2 The implementation of advanced approaches for credit and operational risks.

of the risks covered; v) absence of proper market disclosures; and vi) lack of flexibility in the regulatory framework. Furthermore, the supervisory functions are also not up to date. In this case, the current regime has two major shortfalls: the absence of requirements for supervisors to evaluate the actual risk profile of credit institutions, and the absence of requirements for supervisory cooperation in an increasingly cross-border market.

BASEL II

The new capital adequacy framework is structured according to three fundamental pillars. Under Pillar I, the new framework sets out criteria for banking organisations to adopt more risk-sensitive minimum capital requirements. In particular, it lays out principles for banks to assess the adequacy of their capital. Under Pillar II, principles are designed for supervisors to review the assessment of capital adequacy and to ensure that banks have adequate capital to support their risks. Finally, under Pillar III, provisions are made to enhance market discipline by providing investors with all relevant information needed to assess the risk profile of a bank. Together, these three pillars represent a comprehensive approach to risk management and banking supervision.

THE RISK-SENSITIVE REQUIREMENTS OF THE NEW ACCORD

Compliance with a more risk-sensitive capital ratio is identified as the first pillar of the New Accord, i.e. the minimum capital requirements. The new framework envisages substantial improvements in the calculation of the denominator of the capital ratio – the measurement of risk – whereas the definition of regulatory capital (the numerator of the capital ratio) as well as the minimum requirement of 8% of capital to risk-weighted assets remain unchanged. The new capital adequacy regime has been calibrated by the BCBS to keep the minimum capital requirements for G10 banks generally unchanged. Compared with the current regime, the new framework also widens the scope of the capital ratio by including a "new" category of risk in the definition of risk-weighted assets - operational risk.[3]

$$\frac{\text{Total capital (unchanged)}}{\text{Credit + market + operational risks}} = \text{min. } 8\%$$

A major development in the new capital adequacy regime is the introduction of three increasingly sophisticated and risk-sensitive options regarding the computation of both credit risk and operational risk.

Concerning credit risk measurement, the standardised approach adopted by the new framework is conceptually the same as in the 1988 Capital Accord, but with a higher level of risk sensitivity.[4] Individual risk weights currently depend on the broad category of the borrower: sovereign, bank or corporate. According to the new framework, the risk weights are to be refined, taking into account an external credit rating provided by a recognised external credit assessment institution that meets strict standards.

3 Operational risk can be defined as the risk of a loss mainly resulting from inadequate internal control systems, or from extraordinary external events. The 1988 Capital Accord explicitly covers only two types of risks: credit risk and market risk. Other risks are presumed to be covered implicitly. The treatment of market risk arising from trading activities was subject to a 1996 amendment of the 1988 Capital Accord.

4 For instance, with regard to corporate lending, the 1988 Capital Accord provides only one risk weight category of 100%, whereas Basel II standardised approach provides five categories – 20%, 50%, 75% (for exposures qualified as retail portfolios), 100% and 150%.

Table D.1 Risk measurement approaches

Credit Risk	Market Risk(unchanged)	Operational Risk
Standardised Approach	Standardised Approach	Basic Indicator Approach
Foundation IRB Approach	Internal Models Approach	Standardised Approach
Advanced IRB Approach		Advanced Measurement Approach

Source: BCBS.

The internal rating-based approach (IRB) for credit risk is one of the most innovative elements of the New Accord. In the "foundation" and "advanced" versions, the IRB approach allows banks to determine some of the key elements needed to calculate their own capital requirements. Hence, the risk weights – and thus the capital charges – are determined through the combination of quantitative inputs provided by banks or supervisory authorities and risk weight functions specified by the BCBS. These functions translate the banks' input into specific capital requirements. More specifically, the IRB calculation relies on four quantitative inputs: i) probability of default (PD), which measures the likelihood that the borrower will default over a given time horizon; ii) loss given default (LGD), which measures the proportion of the exposure that will be lost if a default occurs; iii) exposure at default (EAD), which measures, for loan commitments, the amount of the facility that is likely to be drawn if a default occurs and iv) maturity (M), which measures the remaining economic maturity of the exposure. Given a value for each of these inputs, the IRB risk-weight function calculates a specific capital requirement for each exposure. The foundation and advanced IRB approaches differ, the latter including more inputs provided by banks on the basis of their own estimates as opposed to those that have been specified by the supervisor.[5]

As far as the computation of market risk is concerned, the new framework leaves unchanged the approaches foreseen in the 1988 Capital Accord. By contrast, the calculation of operational risk is another innovative area in which the BCBS has developed a new regulatory capital scheme, based on three different measurement approaches. Under the first approach (the basic indicator approach), the capital requirement of a bank to deal with operational risks should be equal to 15% of its annual average gross income over the previous three years. According to the second approach (the standardised approach), banks' gross income is split among eight business lines and multiplied by specific supervisory factors determined by the BCBS, depending upon the operational risk exposure of the individual business areas. The total operational risk capital requirement is the sum of the individual capital requirements of the eight business areas. The third and most sophisticated measurement approach is the Advanced Measurement Approach (AMA). This method requires banks to utilise, among other inputs, their internal loss data in the estimation of required capital. In the AMA, banks may use their own methods for assessing their exposure to operational risk, as long as they are sufficiently comprehensive and systematic.

Across EU Member States, the application of the full range of Basel II approaches is recognised. There are other elements that characterise the implementation of the new framework at the EU level (see Box D.1).

A COMPREHENSIVE CAPITAL REGULATION

An active role for supervisory authorities to ensure that banks have adequate capital to support all risks in their business and intervene whenever necessary is foreseen under Pillar II of the New Accord. The supervisory review process should support and encourage banks to develop and use the risk management function more effectively.

Pillar II of the New Accord provides supervisors with considerably more discretion than before in assessing banks' capital adequacy. In this context, a consistent application of Pillar II across countries, in particular across EU Member States, is of the utmost importance for a prudent assessment of the overall risk profile of institutions and groups and in ensuring a

5 Under both the standardised and the IRB approach, the New Accord also introduces more risk-sensitive approaches to the treatment of so-called credit risk mitigation techniques (collateral, guarantees, credit derivatives and netting), as well as to securitisation. With regard to credit risk mitigants, banks opting for the standardised approach have a choice between two approaches, a simplistic and a comprehensive one, with the latter leading to a higher degree of capital alleviation. Capital treatment for securitisation exposures is determined on the basis of their economic nature as opposed to their legal form. Securitisation can be dealt with under the standardised approach or the IRB approach, in accordance with the underlying exposure securitised.

Box D.1. EU capital framework versus Basel II

Basel II will be integrated into the EU regulatory framework by means of two Directives. On 14 July 2004, the European Commission published its proposal for the amendment of the Consolidated Banking Directive (2000/12/EC) and the Capital Adequacy Directive (93/6/EEC) to revise the capital requirements for financial institutions.

The main elements which characterise the EU capital framework compared to Basel II are the following:

– Basel II applies on a consolidated basis to internationally active banks, whereas in the EU framework capital requirements will be applied, on a consolidated and individual basis, to all credit institutions and investment firms within the EU;

– the EU framework comprises the full range of approaches provided for in Basel II, whereas some non-EU G10 countries will only apply the advanced approaches;

– the EU framework is intended to enhance supervisory cooperation by enhancing the responsibilities of the authority responsible for consolidated supervision with a view to better coordinating supervisory action and to taking certain prudential decisions;

– under the EU framework, investment firms will be subject to capital requirements for operational risk, as is the case with banks;

– in the EU Member States, partial use of the IRB approach is expected to be made available, subject to supervisory approval, with a view to facilitating, mainly for smaller institutions, the use of the IRB approach.

level playing-field. Basel II identifies four key principles of the supervisory review, which complement those outlined in the extensive supervisory guidance developed by the BCBS, namely the Core Principle for Effective Banking Supervision and the Core Principle Methodology (see Box D.2).

FINANCIAL STABILITY IMPLICATIONS OF THE NEW ACCORD

The comprehensive approach adopted by the New Accord is expected to enhance banks' safety and soundness, strengthen the stability of the financial system as a whole, and improve the financial sector's ability to fund and foster sustainable growth for the broader economy.

The New Accord is expected to contribute to financial stability by controlling risks better and by limiting the severity of macroeconomic and sectoral downturns. The first aspect will be fostered by bringing regulatory capital closer to the concept of economic capital, while the second aspect will be made possible by reducing credit disruptions.

From a financial stability perspective, two important elements can be emphasised in the new capital adequacy framework. The first relates to the internal structure and functioning of the New Accord, and the second relates to its external effectiveness.

For the Basel II framework to function effectively and to promote the safety and soundness of credit institutions, a smooth interaction between the three pillars will be needed. The degree of effectiveness of this interplay will vary from country to country,

Box D.2. Four key principles for the supervisory review process (Pillar II)

– Principle 1: Banks should have a process for assessing their overall capital adequacy in relation to their risk profile and a strategy for maintaining their capital levels;

– Principle 2: Supervisors should review and evaluate banks' internal capital adequacy assessment and strategies, as well as their ability to monitor and ensure their compliance with regulatory capital ratios. Supervisors should take appropriate supervisory action if they are not satisfied with the result of this process;

– Principle 3: Supervisors should expect banks to operate above the minimum regulatory capital ratios and should have the ability to require banks to hold capital in excess of the minimum;

– Principle 4: Supervisors should seek to intervene at an early stage to prevent capital from falling below the minimum levels required to support the risk characteristics of a particular bank, and they should require remedial action if capital is not maintained or restored.

depending on the extent to which the individual components of the framework and, in particular, the supervisory review process and market disclosure requirements are actually developed. Supervisory authorities follow different approaches in evaluating the risk profile of banks and in promoting disclosure. Therefore, it is important that some degree of convergence in the implementation of Pillars II and III will be pursued, notably in the EU countries. This objective is also relevant as the new regime empowers supervisors to assess banks' capital adequacy relative to their risk profile. In this context, it is crucial that cooperation among banking supervisors is fostered in order to promote a higher degree of supervisory convergence.

The role of the New Accord in effectively strengthening financial stability also depends on its successful implementation. In particular, stability will be enhanced by the increased alignment of capital requirements with the risks taken by individual banks. The new risk measurement approaches have the advantage of narrowing existing gaps between regulatory capital and risk-based economic capital, which may generate unwarranted distortions. In addition, the incentive to develop and/or improve a tailored risk management function within the individual banking organisations will foster efficiency and stability within the system. In this context, the forward-looking elements of the New Accord will reduce the likelihood of the regulatory framework becoming outdated.

POTENTIAL PRO-CYCLICAL EFFECTS OF THE NEW ACCORD

Notwithstanding the beneficial effects of the new framework on financial stability, some issues are under discussion relating to the potential generation of pro-cyclical lending behaviour on the part of banks. However, the potential ability of the banking system to intensify economic fluctuations does not specifically arise from the framework of the New Accord.[6] All regimes with minimum capital requirements may generate pro-cyclical effects because the capital available to meet the requirements becomes scarcer in recessions, increasing the likelihood that banks will run into constraints on their lending.[7]

Under adverse circumstances, the New Accord could, however, have an effect on the dynamics

6 Pro-cyclicality arises if the capital (or provisions) accumulated during economic upturns are not adequate to cover the risks that materialise in downturns, and if banks are forced to recall loans to satisfy capital requirements.

7 A detailed discussion on this issue together with further references is provided by Allen, L. and A. Saunders (2004), *"Incorporating Systemic Influences Into Risk Measurements: A Survey of the Literature"*. Forthcoming, Journal of Financial Services Research.

of a bank's minimum capital and lending practices in recessions. In contrast to the 1988 Capital Accord where, for a given amount of lending to a particular set of borrowers, the capital requirement was constant over time, Basel II identifies capital requirements which mostly depend on the current risk assessments of borrowers. As a consequence, risk weights can become cyclically sensitive and thus volatile, causing capital requirements to vary over the cycle.

Moreover, as already expressed by the ECB in its reply to the third consultative proposals (CP3)[8], the pro-cyclicality effects of the New Accord might increase in an environment of deeper economic and financial integration, as this could make vulnerabilities and cyclical swings more synchronised. However, such pro-cyclical effects cannot be reduced at the cost of a major misalignment between regulatory and economic capital or of a loss of integrity and "signalling power" in internal risk management systems.

The pro-cyclicality aspects surrounding the New Accord have been mainly expressed in the context of the IRB approach where banks use their own estimates of probability of default. These estimates are based on borrowers' current conditions and are often oriented towards a short time horizon of one year (the so-called point-in-time estimates for PD).

According to a proposal by the European Commission (EC) (see Box D.1), the ECB will contribute to the periodic monitoring of whether the new Capital Adequacy Directive has had a significant effect on the economic cycle. In the light of this examination, the EC will consider whether any remedial measures are justified and will report to the European Parliament and to the Council.

Measures to address pro-cyclicality can vary in terms of scope and nature. Certain elements could be introduced to mitigate pro-cyclicality in the measurement of PDs. Drawing on past experience and using longer-term average PDs could represent a theoretically simple, albeit backward-looking, solution. Furthermore, stress testing can be used to adjust PDs for the effects of different economic conditions. Indeed, this measure is actually proposed in Pillar II for this specific purpose.[9]

An additional measure aimed at alleviating pro-cyclical effects is the building up of additional capital buffers on top of the minimum capital requirements. This can provide banks with more flexibility in their lending behaviour, and allows them to avoid any forced cutback in lending in economic downturns. One way of building up such buffers is through the expanded use by banks and supervisors of proactive provisioning methods such as "dynamic provisioning". This way of financial provisioning would be desirable from a financial stability point of view since it is based on the assessment of expected losses, giving due consideration to the entire risk profile of the loan over the economic cycle.

Overall, the Basel II framework, as published in June 2004, has significantly reduced the extent of possible pro-cyclicality relative to earlier drafts such as CP 2 and CP 3. In particular, adjustments to the risk weights have had a considerable effect on the creation of cyclical capital volatility.

Advances in risk modelling technology can also create the prospect of an "early warning mechanism" with regard to any future deterioration in the loan portfolio. Hence, any deterioration in a bank's loan book should be detected more promptly than under Basel I. This may allow more timely responses by banks, including the recognition of accounting losses or the setting of additional provisions, thereby avoiding an abrupt change in the capital requirements. Furthermore, when minimum capital requirements become binding, there will be fewer incentives for banks under Basel

8 *"The New Basel Capital Accord – Reply of the European Central Bank to the Third Consultative Proposals (CP3)"*, August 2003.

9 Stress tests are also foreseen by the new framework for the IRB banks to assess their capital adequacy.

II to radically reduce credit lines to good quality borrowers, because even a drastic adjustment may not raise the overall capital ratio significantly. In contrast, a restructuring process for troubled borrowers may be the preferred approach to avoid significantly higher capital charges, which could prove beneficial in supporting an economic recovery.

Overall, all these measures can be seen as considerably reducing the potential pro-cyclical effects of the New Accord.

REMAINING CHALLENGES

The adoption of the new capital adequacy framework represents a major success for the BCBS given the complexity of the issue, the increasing political involvement in the US and in the EU, and the substantial efforts needed to resolve contentious elements. However, notwithstanding the successful agreement reached on the Revised Framework, some issues may still warrant further attention:

- Prior to the implementation of Basel II, pressure for changes may stem from other technical studies or open technical issues.

- Efforts to achieve a consistent cross-border application of the new framework are critical, particularly in the EU. To this end, the work of the Accord Implementation Group, a specific substructure of the BCBS dealing with implementation issues, should be supported.

- Regular monitoring and analysis of the implications of the New Accord for the financial system and the economy as a whole is required. In addition to regularly monitoring potential pro-cyclical effects, it will be essential to analyse impacts on some specific sectors, such as the SME sector.

- Finally, there is a need to work in areas closely related to the New Accord, such as the definition of own funds, and to focus on regulatory and accounting requirements – especially in the light of the introduction of the International Accounting Standards.

CONCLUSION

The Revised Framework for Capital Measurement and Capital Standards is designed to provide a more comprehensive, sophisticated and risk-sensitive approach for banks to calculate regulatory capital. It will allow banks to align regulatory requirements more closely with their internal risk measurement. In addition, it will provide them with an opportunity to modernise and upgrade their risk practices, policies and technology. All of these innovative elements are expected to contribute positively to financial stability, and should contribute to the prevention of individual bank failures. The success of the proposed changes will however depend on how they are put into practice by bank managers and how supervisory authorities monitor and steer their effective implementation.

E AGGREGATE EU HOUSEHOLD INDEBTEDNESS: FINANCIAL STABILITY IMPLICATIONS

INTRODUCTION

The household sector is one of the key sectors for financial stability analysis in EU and in the euro area for two main reasons. Firstly, the household sector accounts for a significant proportion of non-bank lending in terms of the stock of credit outstanding. At the end of June 2004, approximately 30% of loans granted to euro area residents were to households (see Chart E.1). By contrast, about 25% were granted to non-financial corporations. This share has not changed very significantly since the start of EMU.

Secondly, the growth rate of lending to this sector has also been the fastest among the non-financial sectors in recent years. The growth rate of loans extended to households in some EU countries has been very strong over recent years. There has been little sign yet of a reversion to more conventional growth patterns in 2004, and this category has been the fastest growing type of lending in the euro area for the past two years (see Chart E.2).

This Special Feature concentrates on lending trends to households over the period 2002-2003, though longer periods are used where relevant. It assesses the most important exposures for euro area and EU banks to the household sector as far as the data allows.[1]

DATA SOURCES FOR FINANCIAL STABILITY ANALYSIS

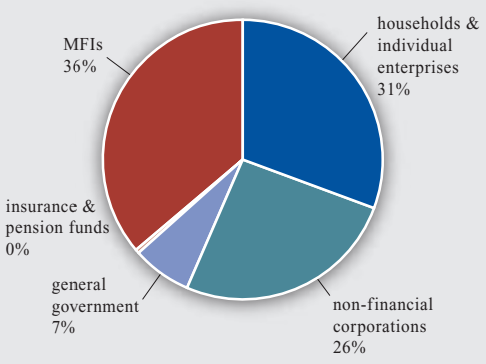
The most comprehensive way of conducting this analysis is to look at multiple sources of data in order to cross-check the analysis. These sources could potentially include the assets and liabilities sides of the household sector's balance sheet; explicitly modelling the debt of the household sector using financial accounts data; or analysis of micro data from representative surveys of each country.[2]

1 The analysis is based on quantitative and qualitative data provided by the Banking Supervision Committee, and on ECB and other data gathered from secondary sources where necessary. Euro area data are used for time series data in some of the graphs owing to the non-harmonised nature of the data in the EU15.

2 For examples of each see Benito, A., J. Whitley and G. Young (2001), *"Analysing Corporate and Household Sector Balance Sheets"*, Bank of England Financial Stability Review, December 2001; Hamilton, R. (2003), *"Trends in Secured Debt"*, Bank of England Quarterly Bulletin, Autumn 2003; Kearns, A. (2003), *"Mortgage Arrears in the 1990s: Lessons for Today"*, Central Bank of Ireland Quarterly Bulletin, Autumn 2003; The Nederlandsche Bank (2003), *"The Financial Behaviour of Dutch Households"*, DNB Quarterly Bulletin, September 2003; and Riksbank (2004), *"Swedish Households' Indebtedness and Ability to Service Debt – An Analysis of Household Data"*, Financial Stability Report, 1/2004. For a more macroeconomic perspective, see Debelle, G. (2004), *"Household Debt and the Macroeconomy"*, BIS Quarterly Review, March.

Chart E.1: Distribution of bank lending to euro area residents

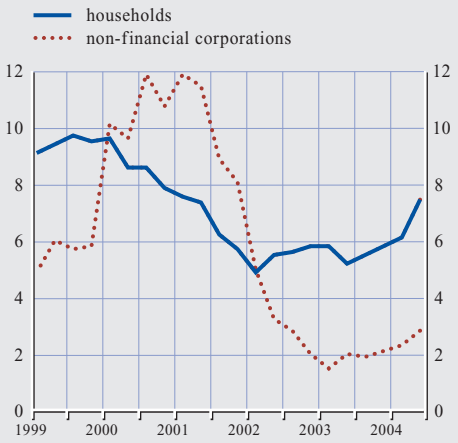
(June 2004)



Source: ECB staff calculations.

Chart E.2 Total loans to euro area households and non-financial corporations

(Mar. 1999 – Jun. 2004; % growth per annum)



Source: ECB.

However, each of these approaches is to a greater or lesser degree unsuitable for the present purpose. A full set of quarterly financial accounts is not yet available for the euro area owing to incomplete information on some instruments and sectors and a lack of published national financial accounts in some Member States. There are also methodological difficulties in comparing data across countries, which precludes the use of more sophisticated modelling approaches based on these data.[3] Finally, micro data have been used in some countries to provide a more holistic view of household indebtedness. For the EU as a whole, there is a lack of a timely data source. The main comprehensive EU data source is the European Community Household Panel Survey (ECHPS), the last panel of which was undertaken in 2001. This article uses harmonised euro area data on banks' lending to households in the euro area and on additional information collected through the Banking Supervision Committee.

HOUSEHOLD LENDING EXPOSURES: AN OVERVIEW

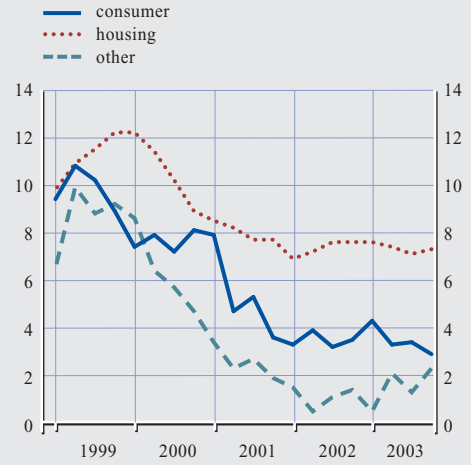
Lending to households has been fuelled both by demand and supply stimuli. A low interest rate environment together with the probable wealth effects of steadily increasing house prices in some EU countries has driven strong demand for housing and consumer credit. At the same time, supply has been fostered by competition between banks in some countries. The resulting growing level of household indebtedness has a number of possible implications for financial stability.

In the euro area, annual consumer loan growth to the household sector peaked at over 10% in 1999, slowing down to about half that rate thereafter. However, it picked up again after the first quarter of 2004. By contrast, even though annual growth rates in loans extended to households for house purchase peaked at over 12% in 1999, they have continued to grow at about 8% thereafter (see Chart E.3).

3 A comparative analysis has been carried out on the non-financial sector balance sheets in the euro area, the US and Japan; see ECB (2004), *"Developments in Private Sector Balance Sheetsin the Euro Area and the United States"*, ECB Monthly Bulletin, February.

Chart E.3 Euro area lending to households by type

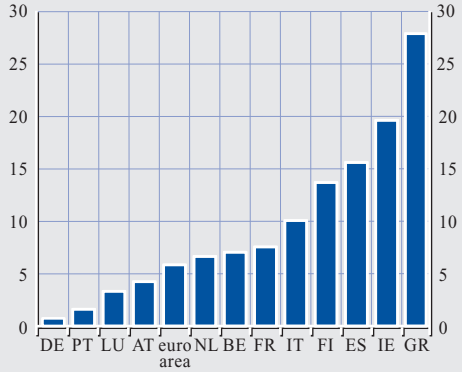
(Q4 1998 – Q3 2003; % growth per annum)



Source: ECB.
Note: The annual growth rates are calculated from flows.

Chart E.4 Loans to households in the euro area

(2002 – 2003, % growth per annum)



Source: ECB.
Note: Growth rates are based on outstanding amounts and do not take into account the effects of securitisations.

SIZEABLE CROSS-COUNTRY DIFFERENCES EXIST IN THE EURO AREA MEMBER STATES

Trends in euro area aggregate data also mask sizeable differences within the region. Chart E.4 shows loan growth to households – including both consumer and housing loans – between 2002 and 2003 by country. Household sector lending growth was fastest in those countries with a relatively strong rate of economic growth. By contrast, loan growth to households was subdued in other countries, for reasons primarily related to sluggish economic growth.

BACKWARD-LOOKING INDICATORS OF RISK EXPOSURES

Given the sizeable difference in growth rates, it may be reasonable to ask whether the risks faced by banks also differ across countries. One of the key risks for banks is the credit risk they face in extending loans to households. A backward-looking indicator of the risk exposure of the banking sector to household loans is the amount of arrears incurred by banks on such loans extended in the past. However, data for EU countries are either not harmonised or incomplete, so that it is only possible to make broad cross-country comparisons.

The distribution of the ratio of loans in arrears and non-performing to total loans for 2003 is relatively uneven across the EU. The majority of the countries for which data were available had a ratio of distressed loans as a proportion of total loans of less than 3%. Some countries had higher figures. These high figures generally relate to a shorter period for the classification of problem loans than for the other countries.[4] Overall, it is difficult to draw any firm conclusions concerning financial stability from this indicator.

HOUSING AND NON-HOUSING LENDING

The main factors underpinning this accumulation of debt have been financial liberalisation such as relaxing liquidity constraints, growth in disposable income and employment, a reduction in repayment burdens through the reduction in nominal and real interest rates over the period, as well as an increase in residential property prices.[5]

Unfortunately, there is a paucity of data concerning arrears owing to housing or non-housing credit to the household sector. To understand the aggregate figures better, the amount of loans granted to the household sector can be split by country into housing and non-housing components. Housing credit can generally be regarded as being secured, as the property provides collateral for a significant proportion of the loan. Non-housing credit can be approximated by other credit granted to households. In common with the dispersion in the growth rate of loans mentioned in the previous section, the distribution of housing and non-housing lending varies significantly across the euro area.

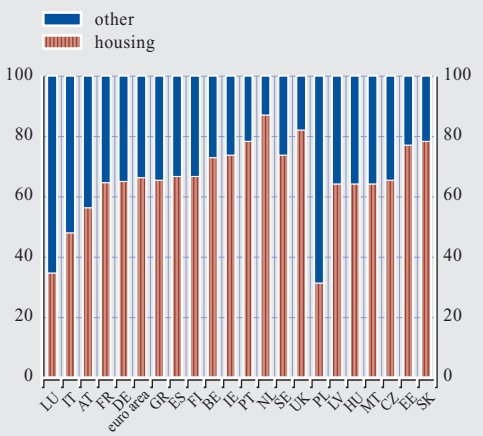
At the end of 2003, about two-thirds of lending to the household sector in the euro area was destined for housing, with the remainder accounted for by consumer lending and other

4 See Moody's (2003), *"Non-performing Loans and Loan-Loss Provisioning Policies in Various European Countries"*, Special Comment, October

5 See ECB (2003), *"Structural Factors in EU Housing Markets"*, for a full discussion of these factors as well as the influence fiscal policy has on the housing market

Chart E.5 Share of housing and non-housing credit in the EU

(end-2003,%)



Sources: ECB and Banking Supervision Committee (BSC) for non-euro area countries.

credit. Within the euro area, the share of housing-related lending in total lending to households in 2003 remained relatively small in several countries (see Chart E.5). At the other extreme, some countries had about 90% in housing lending. In other EU Member States, a significant proportion of lending goes towards housing, as is the case in some of the new Member States.

HOUSING LOAN RISKS

Two factors may be particularly relevant for financial stability analysis in the euro area and in some EU Member States: interest rate sensitivity, and the increase in residential property prices.

REPAYMENT RISK

(i) Repayment burden sensitivity

The effects of interest rate changes will vary depending on how much household net worth is in housing assets and how much is in financial assets. The sensitivity of borrowers to interest rates also depends on the relative availability of fixed and variable rate mortgages. At the end of 2003, about 43% of euro area housing loans were contracted at floating interest rates with initial fixation periods of less than one year, while the remaining 57% were fixed between one and ten years. In the EU, the mix between floating and fixed rate mortgages differs substantially across countries. Table E.1 shows this more clearly. In seven countries, the most common interest rate contracts for new housing loans in 2003 were fixed, while in the remaining 16 countries for which information was available, variable rate loans were more widespread.

The sensitivity of households to changes in repayment burdens will therefore differ substantially, with countries with predominantly floating rates first to feel any changes in interest rates.[6]

Continued debt accumulation may become a source of concern for financial stability if it affects households' debt servicing capacity. The way in which mortgage borrowers adjust to an environment of lower interest rates is ex ante ambiguous. For instance, some borrowers may refinance at lower interest rates to reduce their debt service burden, if this is allowed by banks or if other institutional barriers such as legal fees are not prohibitive. However, other borrowers may take advantage of the lower repayment burden to assume more debt, thereby increasing their indebtedness and, possibly, increasing the duration of their repayment widespread.

(ii) Repayment burden risks

There is a risk that there may be some interest rate illusion among borrowers, given the very low level of nominal interest rates by historical standards. A recent report shows that in one EU country most borrowers focus excessively on the initial financial cost of the mortgage rather than the longer-term level of future interest rates and repayment burdens.[7] In particular, borrowers may not have entirely factored the possibility of future changes in short-term interest rates into their repayment schedules. This risk may be partially mitigated by stress testing exercises for banks and their borrowers, as well as by the fact that, according to the limited information available, heavily indebted borrowers currently make up only a small proportion of banks' loan books.

Other important factors that can impact on the capacity of households to service their debts include the possibility of a rising unemployment rate or of a reduction in disposable income. Ultimately, these can be a source of risk for banks. Whether or not this risk materialises as an idiosyncratic country-specific or as a region-specific shock will colour its importance for the euro area and the EU financial systems.

6 However, even with fixed rate mortgages, there are some risks for repayment burdens. The term until the next period of re-fixing will also have a bearing on the repayment burden faced by households. For example, the Nederlandsche Bank (2003) points out that even though the majority of housing loans were contracted at a fixed rate in the Netherlands, one-quarter of the outstanding mortgage contracts will be re-fixed before the end of 2004

7 See Miles, D. (2003), *"The UK Mortgage Market: Taking a Longer-term View: Interim Report"*, UK Treasury, December, Chapter 3.

Table E.1: Most common types of interest rate contracts for new mortgages in 2003

Country	Type	Country	Type
AT	Variable	DK	Fixed
BE	Fixed	SE	Variable
DE	Fixed	UK	Variable
FI	Variable	CZ	Fixed
FR	Fixed	EE	Variable
GR	Variable	HU	Fixed
IE	Variable	LI	Variable
IT	Variable	MT	Variable
LU	Variable	PL	Variable
NL	Fixed	SL	Variable
PT	Variable		
ES	Variable		

Source: Banking Supervision Committee (BSC).
Note: Variable includes fixed for less than one year. Fixed includes contracts with an initial fixation period of greater than one year.

HOUSING LOANS AND PROPERTY PRICES

(i) Links between property prices and the mortgage market

In recent years, real residential property prices have increased markedly in some countries (see Chart 2.11). While the main increase in indebtedness has for the most part been due to increased income expectations and low nominal interest rates, in some countries the interaction between housing and mortgage market dynamics may have tightened the link between residential property prices and mortgage indebtedness.[8]

One obvious link is mortgage equity withdrawal (MEW). This phenomenon is significant in some EU countries; however, harmonised data do not exist that would enable making a detailed cross-country comparison. Equity withdrawal in itself is not an immediate cause for concern from a financial stability perspective, as it depends on the purpose for which borrowers use the equity. The relatively limited available evidence for euro area Member States from micro-data studies shows that in some countries only a very small percentage of borrowers used MEW to restructure their balance sheets. A recent empirical study examining a small sample of countries also tends to point in this direction, although the magnitude of the effect varies markedly across countries.[9] If household consumption is becoming more closely dependent on mortgage credit and housing markets, then an important issue is whether banks are adopting prudent lending policies that are robust to changing economic circumstances.

A frequently used measure of prudence in mortgage lending is the Loan to Value ratio (LTV). This is the original outstanding amount of mortgage debt expressed as a ratio of the value of the property.[10] LTVs are used by credit institutions as an important input into the decision-making process in advancing new loans. There is a sizeable degree of variation in this ratio across the EU (see Chart E.6).

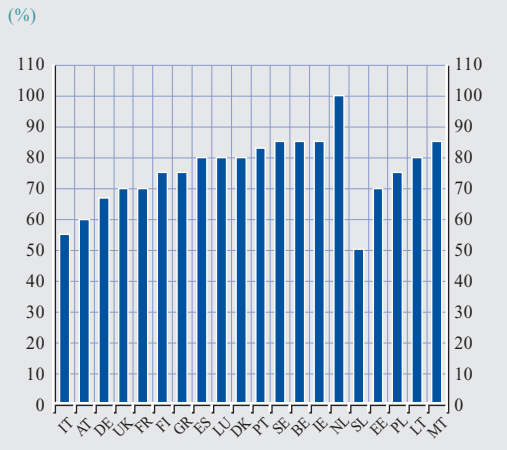
There is some evidence for individual countries that some borrowers have LTVs ranging from 90-100%. However, these represent a small

8 See Gerlach, S. and P. Weng (2004), *"Bank Lending and Property Prices in Hong Kong"*, Journal of Banking and Finance, forthcoming.

9 See Catte, P., N. Girouard, R. Price and C. Andre (2004), *"Housing Markets, Wealth and the Business Cycle"*, OECD Economics Department Working Paper No 394. Given that many of these economies underwent structural changes during the period, the coefficients on the consumption functions should also be interpreted with caution.

10 The method of valuation consists of open market valuation or by reference to historical averages.

Chart E.6 Loan-to-value ratios on new mortgages in 2003



Sources: Banking Supervision Committee (BSC) and ECB (2003).
Note: LTVs are average LTVs on new mortgages loans in 2003.

proportion of the overall stock of lending for house purchase. In several countries LTVs increased slightly in 2003. In general, regulatory restrictions on the maximum level of LTVs do not appear to be common in Member States.

Furthermore, while LTVs may represent the haircut the bank takes on the mortgage loan, different methods for valuation of the house collateralising the loan may impact on the dynamics of lending over the cycle.[11] However, the evidence for this is limited at present.

(ii) Risk of a disorderly correction in residential real estate prices

A reduced ability to repay through either increased repayment burdens or reduced income would not automatically produce increased mortgage defaults and losses for banks, given that mortgage lending is secured. However, the ability of banks to realise this collateral varies across countries.[12]

In a rising interest rate scenario, with floating rates, this may result in both negative income and wealth effects for households. Such effects also depend on households' holdings of financial assets. In the worst-case scenario, a positive correlation between rising interest rates, a decreased ability to repay, and a decline in house prices may cause problems for lenders, particularly those with a substantial exposure to the residential property market. This low probability risk may be more relevant in countries where the mortgage credit and housing markets are becoming ever more closely intertwined.

NON-HOUSING LOAN RISKS

While the increase in consumer credit outstanding has been substantial in some countries, the stock of consumer and other credit as a proportion of total loans to households remains quite small (see Chart E.5). Lending to consumers is usually a high margin business for banks and their consumer finance subsidiaries. One of the reasons why consumer credit attracts high margins is that the loans are usually unsecured and hence carry higher risk. It has grown in importance as a business line in recent years but, as with housing lending, growth has been unevenly distributed across Member States.

PRICING OF CONSUMER CREDIT RISK

In an effort to price risk more efficiently, the use of credit scoring models by banks or their consumer finance company subsidiaries has become widespread. As Chart E.3 shows, this type of lending for the euro area appears to be somewhat more volatile than housing-related lending. This is not especially surprising given that households' ability to repay consumer loans – with relatively short maturities – generally varies with their income and business cycle conditions.

Despite the fact that this type of lending, as a proportion of total household debt, is relatively small, some individual country evidence suggests that it tends to have a higher level of arrears than mortgage debt. The development of scoring models is important in containing the incidence of future write-offs and as part of supervisory initiatives to improve risk management practices (see Special Feature D). Scoring models are also subject to model uncertainty, and may not perform as accurately during economic downturns owing to changes in household behaviour, or if losses do not follow historical patterns. One instructive example can be taken from the US experience during the 2001 downturn. For secured lending (credit card and other consumer loans), one-third of respondents to the Federal Reserve senior loan officer survey – conducted in January 2002 – reported worse expected credit quality than would have been predicted by their credit scoring models, taking the slowdown into account.[13] Given that the use of these models is quite widespread in Europe, there is a need to review periodically the assumptions upon which

11 See Tsatsaronis, K. and H. Zhu (2004), *"What Drives Housing Price Dynamics: Cross-country Evidence"*, BIS Quarterly Review, March.
12 See Catte et al. (2004).
13 Senior Loan Officer Opinion Survey, January 2002.

these models are based in order to ensure their accuracy regarding expected losses.

CONCLUSIONS

At the current juncture, the risks facing the EU banking sector as a whole that arise from exposure to households appear relatively sanguine, though the situation varies at a country level. There are some caveats concerning the analysis of risks from a "top-down" perspective, i.e. by using aggregate data. The ideal situation would be to complement this type of analysis with household micro data in order to understand better the distribution of European indebtedness and the consequences of this for banks.

The risks to the banking sector posed by stretched household balance sheets are quite closely linked to the evolution of the macroeconomy, as this impacts on the ability of households to service their debt burdens. The improvement of banks' risk management systems and risk transfer methods may mitigate this to some extent. Improved risk management may also have led to European banks' provisioning for losses being less cyclical in nature. The available evidence for the euro area and the EU suggests that banks have increased their solvency ratios, which will contribute further to resilience in the face of unexpected losses.

Looking forward, to the extent that households have been myopic concerning the future evolution of interest rates, an unanticipated increase in repayment burdens across Member States could lead to household balance sheet strains, ultimately posing credit risks for banks. Given differences in the share of fixed and floating rate debt across the EU countries, increased burdens are not likely to be shared symmetrically by households across the region.

STATISTICAL ANNEX

EXTERNAL ENVIRONMENT

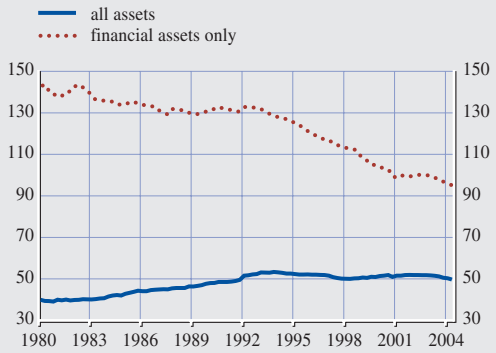
Chart S1 US non-financial corporate and business debt-to-GDP ratios

(Q1 1960-Q2 2004, %)

Sources: US Federal Reserve Board, US Bureau of Economic Analysis (BEA) and ECB calculations.
Note: Non-financial business comprises of three sectors: non-farm non-financial corporate business, non-farm non-corporate business, and farm business.

Chart S2 US corporate liabilities-to-asset ratio

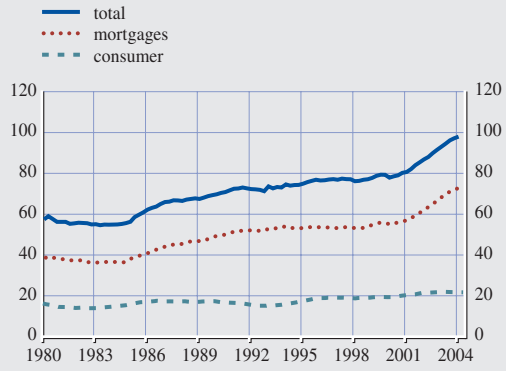
(Q1 1980-Q2 2004, %)



Source: US Federal Reserve Board.

Chart S3 US household debt-to-disposable income ratio

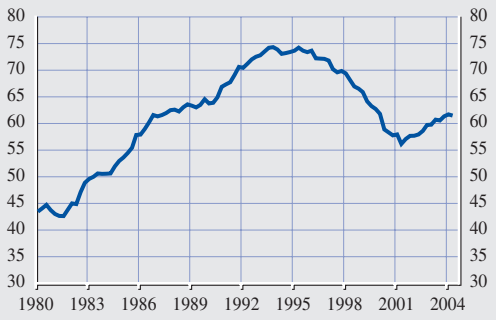
(Q1 1980-Q2 2004, % of personal disposable income)



Source: US Federal Reserve Board.

Chart S4 US government debt-to-GDP ratio

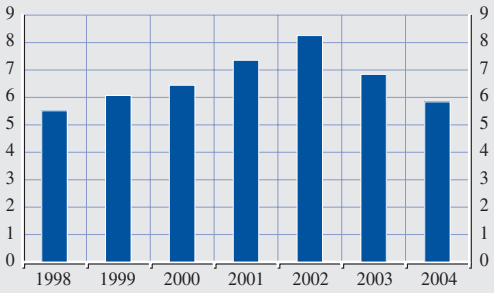
(Q1 1980-Q2 2004, %)



Source: US Federal Reserve Board.

Chart S5 Japanese banks non-performing loans

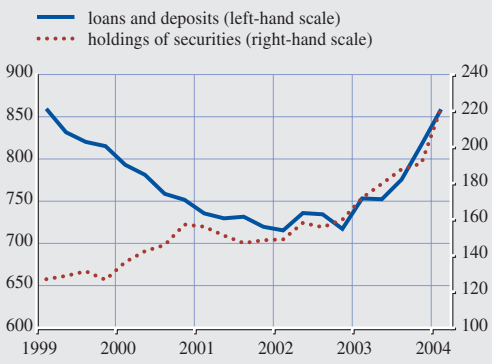
(1998-2004, % of total loans)



Source: Japanese Financial Services Agency.
Note: All data are recorded for end-September, except end-March for 2004.

Chart S6 International positions of all BIS reporting banks vis-à-vis emerging markets

(Q1 1999-Q1 2004, USD billions)



Source: Bank for International Settlements (BIS).

Table S1 Selected financial vulnerability indicators for some of the main emerging market economies

	Current account balance (% of GDP)		External debt (% of GDP)		Short-term external debt (% of reserves)		Foreign reserves (in months of imports)	
	2001	2004(e)	2001	2004(e)	2001	2004(e)	2001	2004(e)
Latin America								
Argentina	-1.5	3.9	54	96	110	94	4.3	5.5
Brazil	-4.6	1.5	45	39	84	48	4.5	6.0
Chile	-1.6	1.7	57	49	33	44	6.9	5.9
Mexico	-2.9	-1.8	26	26	90	71	2.6	3.4
Venezuela	1.6	10.8	27	40	42	11	4.0	11.2
Asia								
China	1.5	2.3	14	13	17	15	8.6	10.1
India	0.2	0.1	24	20	23	13	7.7	11.7
Indonesia	4.2	2.1	81	48	68	44	5.5	5.6
Malaysia	8.3	9.8	52	47	21	19	3.9	5.4
South Korea	1.7	3.9	27	26	41	32	6.9	7.7
Thailand	5.4	3.6	58	30	35	25	5.2	4.7
Emerging Europe								
Russia	9.8	5.9	42	33	65	47	5.7	8.9
Turkey	2.3	-4.1	79	53	105	106	4.2	4.0

Source: Institute of International Finance.
Note: Data for 2004 are estimates.

INTERNATIONAL FINANCIAL MARKETS

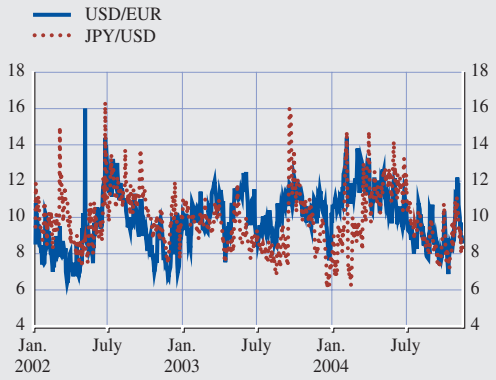
Chart S7 Nominal broad USD effective exchange rate index

(Jan. 2002-Nov. 2004; index: Jan. 1997 = 100)

Source: US Federal Reserve Board.

Chart S8 Implied volatility for USD/EUR and JPY/USD

(Jan. 2002-Nov. 2004, % per annum)



Source: Bloomberg.

Chart S9 US risk aversion index

(Jan. 1990-Oct. 2004)

Source: Goldman Sachs.
Note: The risk aversion index ranges between 0 and 10 and it measures investors' willingness to invest in risky assets as opposed to risk-free securities.

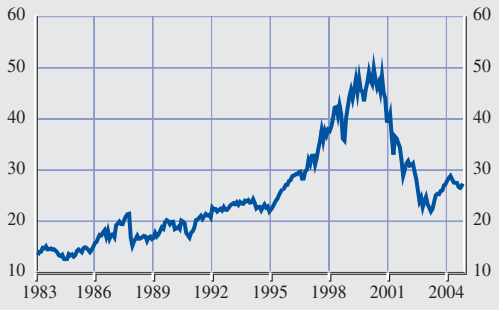
Chart S10 Stock prices in the US

(Jan. 2002-Nov. 2004, S&P 500, index: Jan. 2003 = 100)

Source: Reuters.

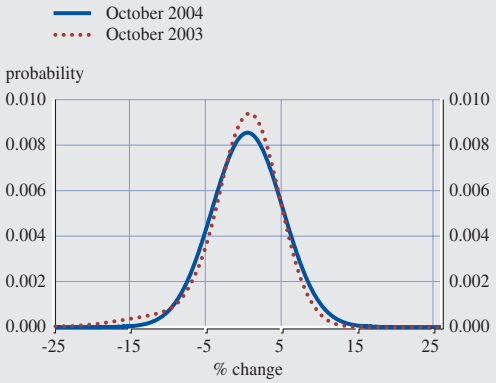
Chart S11 Price-earnings (P/E) ratio for the US stock market

(Feb. 1983-Nov. 2004, ten-year trailing earnings)



Source: Thomson Financial Datastream and ECB calculations.
Note: The price-earnings ratio is based on prevailing stock prices relative to an average of the previous ten years of earnings.

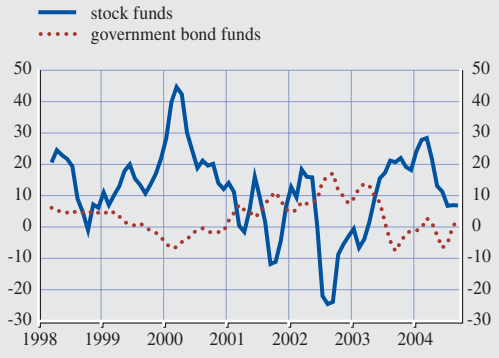
Chart S12 Option implied probability distribution function for the S&P 500 index



Sources: Bloomberg and ECB calculations.

Chart S13 US mutual fund flows

(Mar. 1998-Sep. 2004, USD billions, three-month moving average)



Source: Investment Company Institute.

Chart S14 US Stock market leverage: debit balances in New York Stock Exchange margin accounts

(Jan. 1992-Oct. 2004, USD billions)

Source: New York Stock Exchange (NYSE).

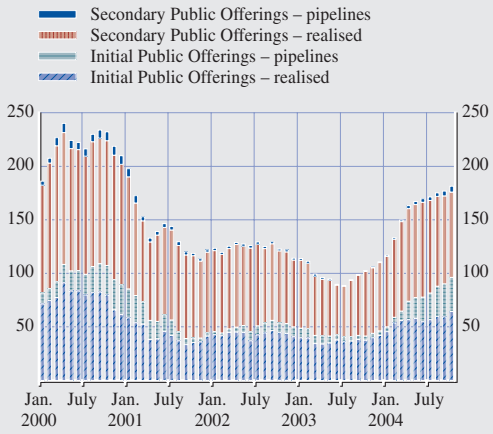
Chart S15 Open interest in options contracts on the S&P 500 index

(Jan. 1999-Oct. 2004, millions of contracts)

Source: Chicago Board Options Exchange (CBOE).

Chart S16 Gross equity issuance in the US

(Jan. 2000-Oct. 2004, USD billions, 12-month moving sums)



Source: Thomson Financial Datastream.

Chart S17 Spreads on US high-yield corporate bonds

(Jan. 1999-Nov. 2004, basis points)

Source: JP Morgan Chase & Co.
Note: Spread between yield to maturity of US domestic high-yield index (BB+ rating or below, average maturity of 7.7 years) and US ten-year government bond yield.

Chart S18 Emerging market bond spreads

(Dec. 1993-Oct. 2004, basis points)

Sources: JP Morgan Chase & Co.
Note: The series shown is the Emerging Market Bond Index Plus (EMBI+) "performing" index.

Table S2 Total international bond issuance (private and public) in Asian and Latin American emerging markets

(USD millions)

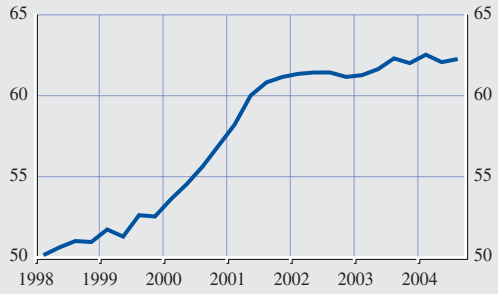
	2000	2001	2002	2003	2004 Q1	2004 Q2	2004 Q3	2004 Total Q1-Q3
Latin America	30,115	30,379	19,143	32,460	12,039	7,536	5,229	**24,805**
of which:								
Argentina	10,698	3,328	-	-	915	-	-	**915**
Brazil	10,054	7,917	5,736	11,803	3,414	1,207	2,922	**7,542**
Chile	195	2,875	1,399	1,000	750	-	-	**750**
Colombia	1,525	4,004	1,000	1,265	500	-	500	**1,000**
Mexico	5,747	7,552	6,278	11,051	4,574	4,648	1,558	**10,781**
Venezuela	658	1,729	1,049	4,478	1,200	1,180	-	**2,380**
Non-Japan Asia	25,337	31,774	35,633	50,567	15,957	11,987	14,331	**42,276**
of which:								
China	995	2,552	860	3,029	313	39	1,600	**1,952**
Hong Kong	7,354	9,267	1,645	12,631	1,910	999	1,799	**4,708**
India	-	99	153	450	888	975	620	**2,483**
Korea	6,593	6,542	12,038	11,368	4,610	3,897	3,350	**11,857**
Malaysia	1,420	1,766	5,965	1,442	325	650	2,335	**3,310**
Singapore	3,791	7,400	812	3,885	1,864	1,402	1,953	**5,220**
Thailand	-	-	48	300	-	1,000	400	**1,400**

Source: Capital Data.
Note: Regions are defined as follows: Latin America; Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Uruguay, Venezuela. Non-Japan Asia; Brunei, Burma, China, Special Administrative Region of Hong Kong, Indonesia, Laos, Macau, Malaysia, Nauru, North Korea, Philippines, Samoa, Singapore, South Korea, Taiwan, Thailand, Vietnam.

EURO AREA ENVIRONMENT

Chart S19 Euro area corporate debt-to-GDP ratio

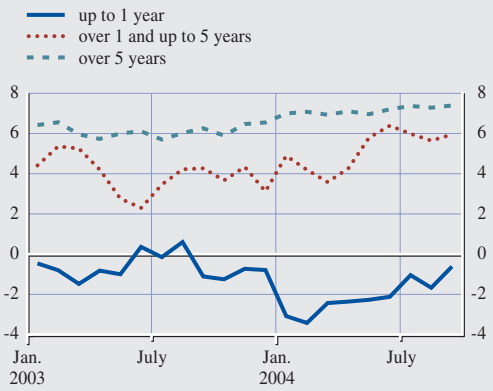
(Q1 1998-Q2 2004, %)



Source: ECB.

Chart S20 Annual growth of loans to non-financial corporations in the euro area for selected maturities

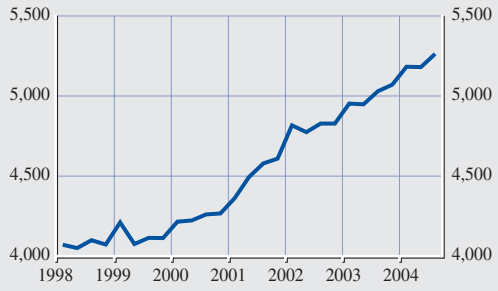
(Jan. 2003-Sep. 2004, %)



Source: ECB.
Note: Data are based on outstanding amounts of monetary and financial institutions' loans.

Chart S21 Total amount outstanding of MFI deposits of the non-financial corporate sector in the euro area

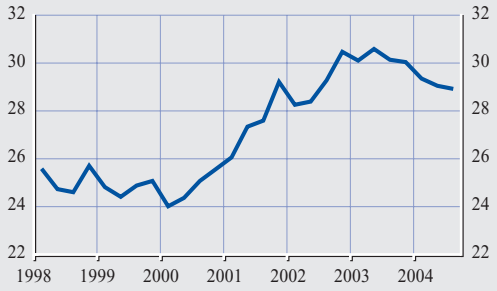
(Q1 1998-Q2 2004, EUR billions)



Source: ECB.
Note: MFI denotes monetary financial institutions.

Chart S22 Total debt to total financial assets ratio for non-financial corporations in the euro area

(Q1 1998-Q2 2004, %)



Source: ECB.

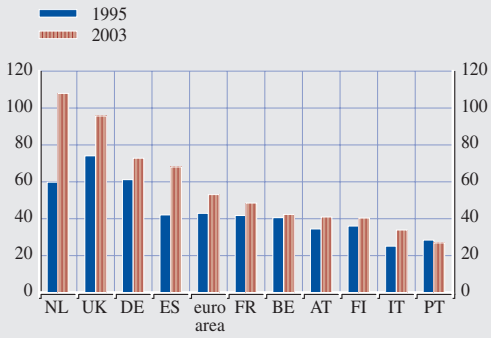
Chart S23 Annual growth of euro area corporate earnings per share (EPS)

(Jan. 1992-Nov. 2004, %, 12-month trailing)

Source: Thomson Financial Datastream, I/B/E/S Global Indices.

Chart S24 Household debt-to-GDP ratios in the EU15

(1995, 2003, average % per annum)

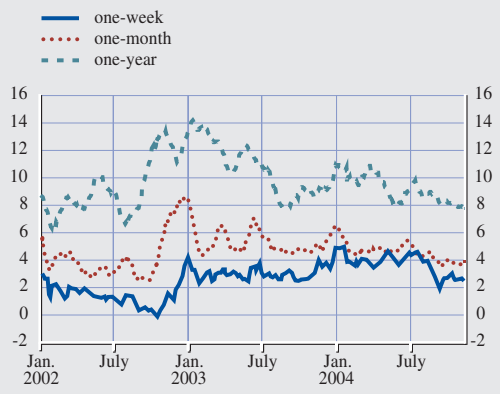


Sources: Annual national financial accounts and Online National Statistics UK (ONS).

EURO AREA FINANCIAL MARKETS

Chart S25 Euro area spreads between interbank deposit and repo interest rates

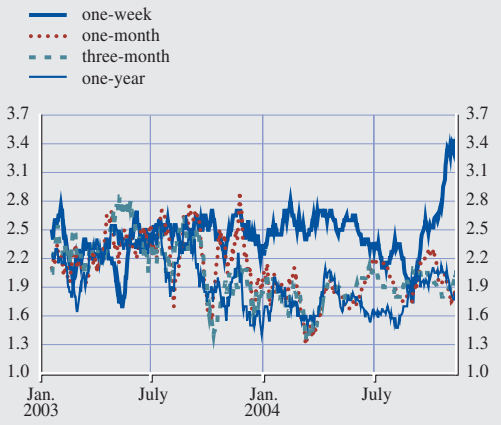
(Jan. 2002-Nov. 2004, basis points, 20-day moving average)



Source: ECB.

Chart S26 Bid-ask spreads for EONIA swap rates

(Jan. 2003-Nov. 2004, basis points, 20-day moving average)



Source: ECB.

Chart S27 Stock prices in the euro area

(Jan. 2002-Nov. 2004, Dow Jones EURO STOXX, index: Jan. 2003 = 100)

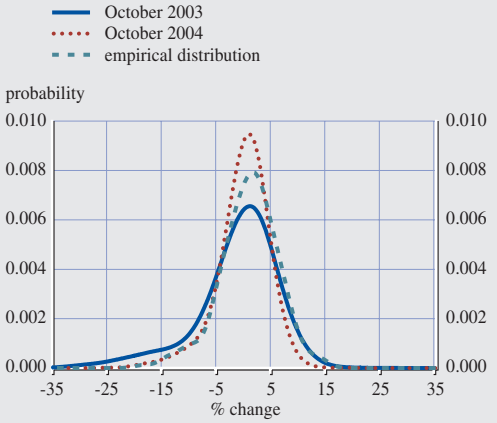
Source: Reuters.

Chart S28 Price-earnings (P/E) ratio for the euro area stock market

(Feb. 1983-Nov. 2004, ten-year trailing earnings)

Source: Thomson Financial Datastream and ECB calculations.
Note: The price-earnings ratio is based on prevailing stock prices relative to an average of the previous ten years of earnings.

Chart S29 Option implied probability distribution function for the Dow Jones EURO STOXX 50 index



Sources: Bloomberg and ECB calculations.
Note: The empirical distribution is constructed from non-overlapping 30-day returns from January 1988 to October 2004.

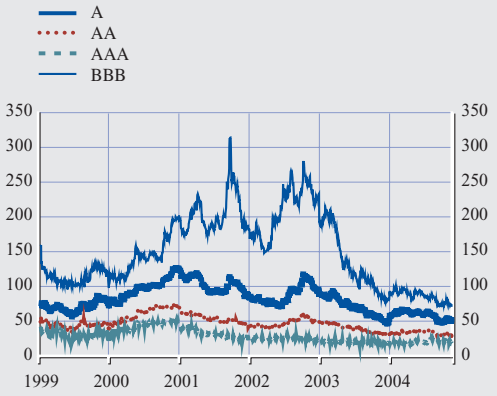
Chart S30 Open interest in options contracts on the Dow Jones EURO STOXX 50 index

(Jan. 1999-Sep. 2004, millions of contracts)

Source: Eurex.

Chart S31 Corporate bond spreads in the euro area

(Jan. 1999-Nov. 2004, basis points, seven-ten year maturity)



Source: Thomson Financial Datastream.

Chart S32 Spreads on euro area high-yield corporate bonds

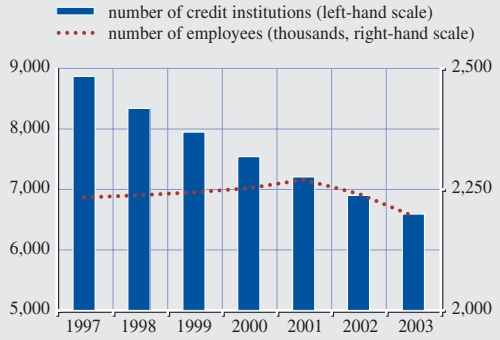
(Jan. 1999-Nov. 2004, basis points)

Source: JP Morgan Chase & Co.
Note: Spread between yield to maturity of euro area high-yield index (BB+ rating or below, average maturity of 5,5 years) and euro area 5 year government bond yield.

EURO AREA FINANCIAL INSTITUTIONS

Chart S33 Euro area banks: number of institutions and staff

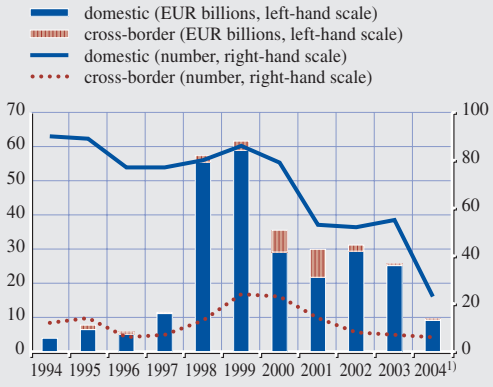
(1997-2003)



Source: ECB.
Note: The number of credit institutions is based on unconsolidated data.

Chart S34 Mergers and acquisitions within the euro area banking sector

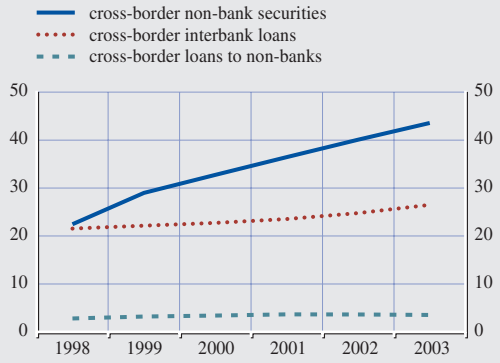
(1994-2004)



Source: Thomson Financial (SDC Platinum).
Note: Cross-border deals refer to inter-euro area mergers and acquisitions (M&A). The number of deals includes both deals with and without reported value. The coverage of M&A may be non-exhaustive.
1) Figures for 2004 refer to the first half of the year.

Chart S35 Cross-border activity of euro area banks

(1998-2003, % of total outstanding amounts)



Source: ECB.
Note: Cross-border activity refers to cross-euro area activity (i.e. it excludes international activities in non-euro area and third countries).

Table S3 Euro area banking sector structure

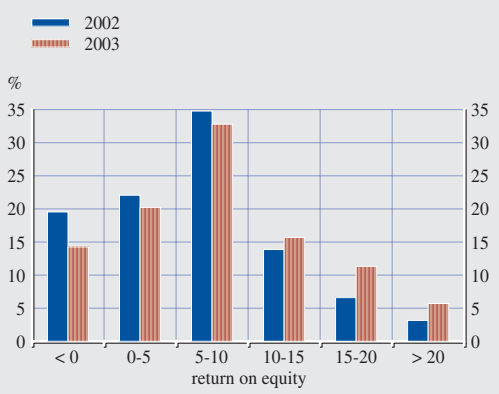
(2003)

Number of credit institutions	
Stand-alone credit institutions	4,233
Banking groups	499
Credit institutions	4,732
Domestic credit institutions	3,834
Foreign-controlled subsidiaries and branches	898
Total assets of euro area credit institutions in the sample (end-2003 – EUR billions)	
Domestic credit institutions	17,642
of which (%):	
Large	*67*
Medium-sized	*29*
Small	*5*
Foreign-controlled subsidiaries and branches	2,536

Source: Banking Supervision Committee (BSC).
Note: Data are consolidated. Foreign EU and non-EU banks are under-represented in the sample as one country does not differentiate between domestic and foreign banks owing to national statistical reporting standards. This also affects the share of large, medium-sized and small banks' assets in total assets.

Chart S36 Frequency distribution of the return on equity (ROE) for euro area banks (after tax and extraordinary items)

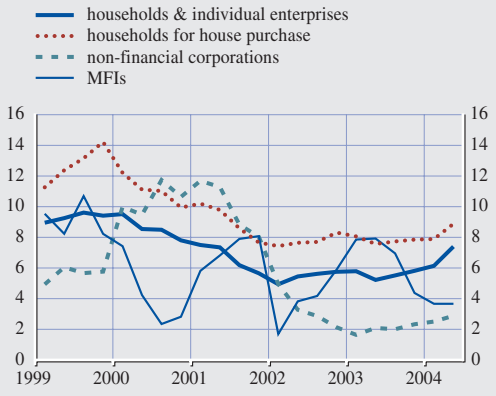
(2002-2003, %)



Source: Banking Supervision Committee (BSC).

Chart S37 Euro area bank annual credit growth extended by sector

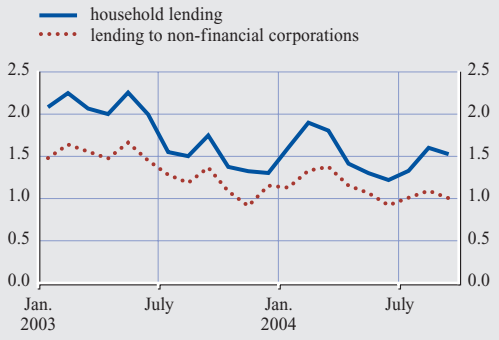
(Q1 1999-Q2 2004, %)



Source: ECB.
Note: Growth rates are based on stock data.

Chart S38 Lending margins of euro area banks

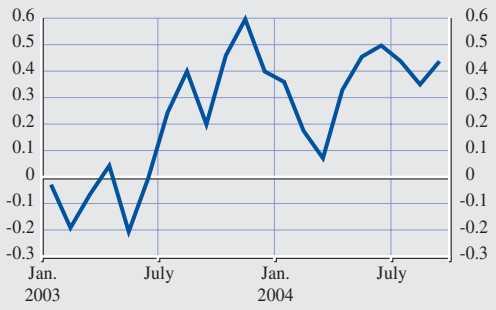
(Jan. 2003-Sep. 2004, % points)



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 maturities.

Chart S39 Deposit margin of euro area banks

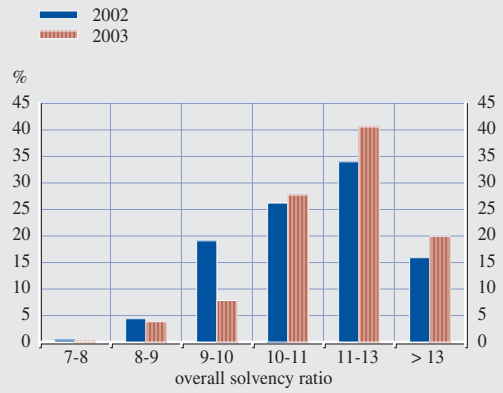
(Jan. 2003-Sep. 2004, % points)



Source: ECB.
Note: The weighted deposit margins are the difference between the interest rate swap rate and the deposit rate, where both have corresponding maturities.

Chart S40 Frequency distribution of overall solvency ratios for euro area banks

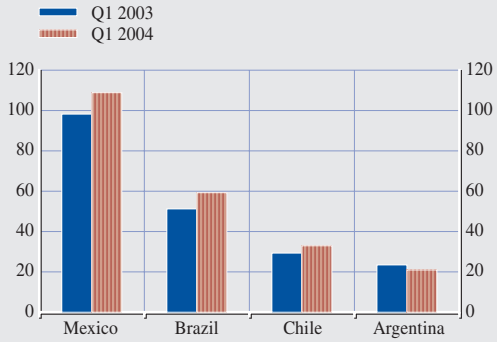
(2002-2003, % of risk-weighted assets)



Source: Banking Supervision Committee (BSC).

Chart S41 International exposure of euro area banks to Latin American countries

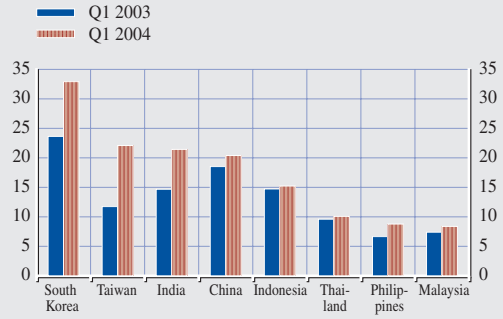
(USD billions)



Source: Bank for International Settlements (BIS).

Chart S42 International exposure of euro area banks to Asian countries

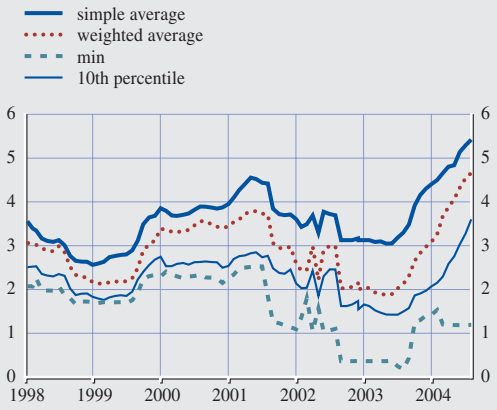
(USD billions)



Source: Bank for International Settlements (BIS).

Chart S43 Distance-to-default indicators for large euro area banks

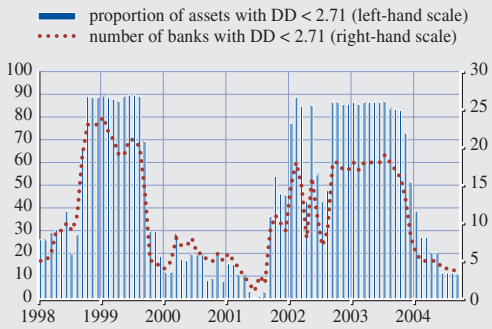
(Jan. 1998-Sep. 2004)



Sources: Thomson Financial Datastream, Bankscope and ECB calculations.
Note: The estimations are based on data for 37 large banks. An increase in the distance-to-default reflects an improving assessment.

Chart S44 Threshold indicators based on distance-to-default for large euro area banks

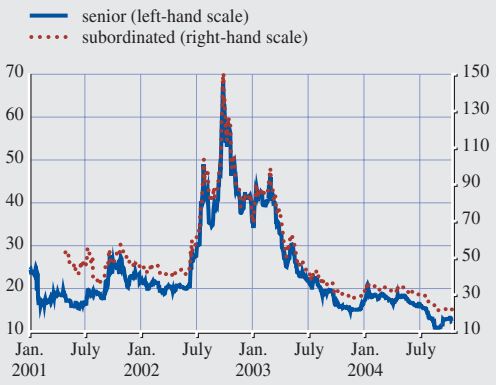
(Jan. 1998-Sep. 2004)



Sources: Thomson Financial Datastream, Bankscope and ECB calculations.
Note: The estimations are based on data for 37 large banks. The threshold used of a distance-to-default (DD) of less than 2.71 corresponds to the threshold between investment-grade and speculative-grade credit quality used by rating agencies (i.e. an implied probability of default in a year larger than 0.65).

Chart S45 European banks' credit default swaps on senior and subordinated debt

(Jan. 2001-Nov. 2004, basis points)



Source: Credit Trade.
Note: "European" corresponds to Credit Trade's definition.

Table S4 Euro area consolidated foreign claims of reporting banks on individual countries

(USD billions)

	Q1 2002	Q2 2002	Q3 2002	Q4 2002	Q1 2003	Q2 2003	Q3 2003	Q4 2003	Q1 2004
Total All countries	**3,141.7**	**3,398.1**	**3,396.1**	**3,685.4**	**3,890.6**	**4,211.6**	**4,191.3**	**4,389.4**	**4,954.7**
Hong Kong	27.4	28.1	30.2	25.2	26.3	30.3	30.0	31.9	35.3
Singapore	28.3	22.1	29.3	24.9	31.4	31.0	31.6	29.1	34.8
Total Offshore Centres	241.3	238.5	247.0	237.8	269.4	272.8	290.6	302.4	334.8
China	15.8	17.7	17.4	16.0	18.5	19.0	20.2	19.0	20.4
India	11.6	11.6	11.1	13.9	14.7	15.9	17.6	18.4	21.4
Indonesia	14.1	14.9	14.6	14.6	14.7	15.8	15.0	15.2	15.2
Malaysia	7.5	7.4	7.2	7.2	7.4	8.2	8.7	8.7	8.4
Philippines	6.3	6.5	6.8	6.7	6.6	6.9	7.5	7.5	8.8
South Korea	19.6	20.6	20.7	21.7	23.6	27.0	30.0	29.9	32.9
Taiwan China	8.2	10.1	12.0	11.1	11.7	13.6	17.2	17.9	22.1
Thailand	11.1	10.6	10.5	9.5	9.6	9.5	10.4	9.9	10.1
Total Asia and Pacific EMEs	**107.1**	**113.6**	**114.8**	**115.0**	**121.6**	**130.9**	**142.9**	**145.1**	**160.3**
Russia	28.6	23.2	24.0	24.1	24.3	25.8	28.0	33.3	37.1
Turkey	19.5	20.4	19.4	20.3	20.6	20.5	20.8	22.5	22.7
Total European EMEs	**197.2**	**214.3**	**219.5**	**236.6**	**244.2**	**256.0**	**270.6**	**322.8**	**324.2**
Argentina	25.3	23.2	23.3	23.3	23.5	23.1	22.9	21.6	21.0
Brazil	69.2	64.7	54.8	55.4	51.2	54.4	57.1	59.4	59.3
Chile	29.7	28.6	27.6	28.5	29.3	29.2	29.9	32.6	33.0
Colombia	8.2	8.1	7.4	6.9	6.8	6.7	6.7	6.4	6.8
Ecuador	0.6	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.8
Mexico	108.0	106.6	98.2	100.6	98.2	100.7	100.7	103.9	108.9
Peru	10.7	10.9	10.8	9.2	8.7	9.8	9.2	9.5	9.3
Uruguay	4.9	3.0	2.8	2.5	2.2	2.0	2.1	2.0	2.0
Venezuela	12.4	10.8	10.5	11.1	10.5	10.8	11.7	13.1	12.1
Total Latin American and Caribbean	**277.8**	**265.7**	**245.2**	**247.0**	**239.9**	**245.9**	**249.8**	**258.4**	**262.4**

Source: Bank for International Settlements (BIS).

Table S5 Indicators of euro area banks' profitability and efficiency

(2003)

	All banks[1]	Change from 2002[2]	Large[1]	Change from 2002[2]	Medium[1]	Change from 2002[2]	Small[1]	Change from 2002[2]	Foreign[3]	Change from 2002[2]
Income (% of total assets)										
Net interest income	1.26	*-0.04*	1.01	*-0.05*	1.65	*-0.03*	2.42	*0.00*	1.00	*-0.05*
Interest receivable	3.94	*-0.74*	3.68	*-0.89*	4.43	*-0.45*	4.65	*-0.40*	4.43	*-0.73*
Interest payable	2.68	*-0.70*	2.67	*-0.84*	2.78	*-0.42*	2.22	*-0.40*	3.43	*-0.68*
Net non-interest income	1.10	*-0.02*	1.22	*-0.03*	0.79	*-0.02*	1.22	*0.21*	0.98	*0.05*
Fees and commissions (net)	0.59	*-0.04*	0.59	*-0.06*	0.53	*0.01*	0.81	*0.11*	0.56	*-0.01*
Trading and forex results	0.20	*0.04*	0.27	*0.05*	0.06	*0.00*	0.06	*0.03*	0.17	*0.06*
Other operating income (net)	0.31	*-0.02*	0.35	*-0.02*	0.21	*-0.03*	0.35	*0.07*	0.25	*0.00*
Total income	2.35	*-0.06*	2.22	*-0.08*	2.44	*-0.05*	3.64	*0.21*	1.98	*0.00*
Expenditure structure (% of total assets)										
Staff costs	0.87	*-0.05*	0.84	*-0.06*	0.85	*-0.02*	1.45	*0.04*	0.67	*-0.05*
Administrative costs	0.52	*-0.04*	0.51	*-0.05*	0.48	*-0.03*	0.86	*0.05*	0.47	*-0.05*
Other	0.13	*-0.01*	0.11	*-0.01*	0.14	*-0.01*	0.23	*0.00*	0.09	*-0.02*
Total expenses	1.52	*-0.10*	1.47	*-0.12*	1.46	*-0.06*	2.54	*0.09*	1.23	*-0.11*
Profitability (% of total assets)										
Operating profits	0.84	*0.04*	0.76	*0.04*	0.98	*0.00*	1.10	*0.12*	0.75	*0.12*
Specific provisions	0.37	*-0.04*	0.31	*-0.04*	0.47	*-0.02*	0.47	*-0.13*	0.19	*-0.11*
Funds for general banking risks	0.01	*0.00*	0.01	*0.01*	0.01	*-0.01*	0.02	*-0.01*	0.02	*0.01*
Net profits from subsidiaries less value adjustment from consolidation	0.01	*0.00*	0.00	*0.00*	0.02	*0.01*	0.00	*0.00*	-0.01	*-0.01*
Extraordinary items (net)	0.00	*-0.04*	-0.03	*-0.03*	0.06	*-0.05*	0.08	*-0.06*	0.05	*-0.03*
Tax charges	0.16	*0.03*	0.14	*0.03*	0.19	*0.02*	0.26	*0.09*	0.12	*0.01*
Profits (before tax and extraord. items)	0.47	*0.08*	0.44	*0.07*	0.52	*0.05*	0.61	*0.26*	0.52	*0.20*
Profits (after tax and extraord. items) (ROA)	0.31	*0.01*	0.27	*0.02*	0.39	*-0.02*	0.43	*0.12*	0.45	*0.17*
Return on equity										
Profits (after tax and extraord. items) (% Tier 1) (ROE)	7.87	*0.25*	7.93	*0.57*	8.29	*-0.72*	5.83	*1.49*	10.25	*3.95*
Income structure (% of total income)										
Net interest income	53.47	*-0.42*	45.32	*-0.48*	67.46	*0.18*	66.52	*-4.03*	50.59	*-2.15*
Net non-interest income	46.53	*0.42*	54.68	*0.48*	32.54	*-0.18*	33.48	*4.03*	49.41	*2.15*
Fees and commissions (net)	24.88	*-0.83*	26.72	*-1.78*	21.66	*0.75*	22.22	*1.77*	28.32	*-0.67*
Trading and forex results	7.84	*1.59*	11.10	*2.42*	2.21	*0.01*	1.44	*0.82*	7.89	*2.75*
Other operating income (net)	13.15	*-0.54*	15.73	*-0.50*	8.55	*-0.96*	9.74	*1.40*	12.69	*0.05*
Expenditure structure (% of total costs)										
Staff costs	57.63	*0.49*	57.41	*0.45*	58.24	*0.84*	57.21	*-0.51*	54.27	*0.82*
Administrative costs	34.08	*-0.40*	34.78	*-0.36*	32.54	*-0.77*	33.82	*0.75*	38.08	*-0.06*
Other	8.29	*-0.08*	7.81	*-0.09*	9.22	*-0.08*	8.97	*-0.24*	7.64	*-0.76*
Efficiency										
Cost-to-income (% of total income) (incl. spec. taxes, value adj.)	64.46	*-2.40*	65.98	*-3.06*	59.95	*-1.02*	69.76	*-1.74*	62.24	*-5.31*

Source: Banking Supervision Committee (BSC).
1) Data mostly cover domestically-owned banking groups on a cross-border consolidated basis. However, for one euro area country, "all banks" includes foreign EU and non-EU branches and subsidiaries owing to national statistical reporting standards. This results in some double counting in the consolidated data.
2) Percentage points. Based on data for 10 countries.
3) Data covers foreign-controlled (EU and non-EU) subsidiaries and branches for 11 euro area countries.

Table S6 Euro area banks' non-performing loans and provisioning

(2003)

	All banks[1]	Change from 2002[2]	Large[1]	Change from 2002[2]	Medium[1]	Change from 2002[2]	Small[1]	Change from 2002[2]	Foreign[3]	Change from 2002[2]
Asset quality (% of loans and advances)										
Non-performing and doubtful loans (gross)[4]	3.39	*-0.05*	2.85	*-0.05*	4.03	*-0.04*	6.99	*0.06*	1.95	*-0.07*
Asset quality (% of own funds)[5]										
Non-performing and doubtful loans (gross)[4]	55.97	*-2.00*	52.10	*-1.85*	62.03	*-2.57*	66.94	*-1.23*	28.95	*-1.87*
Non-performing and doubtful loans (net)[4]	17.74	*-2.03*	11.58	*-1.30*	25.83	*-3.67*	32.09	*-1.43*	-1.71	*2.30*
Provisioning (stock) (% of loans and advances)										
Total provisions	2.28	*0.05*	2.22	*0.01*	2.19	*0.13*	3.58	*0.12*	1.39	*-0.25*
Provisioning (stock) (% of non-performing and doubtful assets)[4]										
Total provisions	68.30	*2.38*	77.78	*1.65*	58.51	*4.02*	52.16	*1.23*	109.28	*-7.09*

Source: Banking Supervision Committee (BSC).
1) Data mostly cover domestically-owned banking groups on a cross-border consolidated basis. However, for one euro area country, "all banks" includes foreign EU and non-EU branches and subsidiaries owing to national statistical reporting standards. This results in some double counting in the consolidated data.
2) Percentage points. Based on data for 10 countries.
3) Data covers foreign-controlled (EU and non-EU) subsidiaries and branches for 11 euro area countries.
4) Definitions of non-performing and doubtful loans differ between countries. Consequently these data should be interpreted with caution.
5) Tier 1 is used for own funds.

Table S7 Euro area banks' balance sheet and selected off-balance sheet items

(2003)

	All banks[1]	Change from 2002[2]	Large[1]	Change from 2002[2]	Medium[1]	Change from 2002[2]	Small[1]	Change from 2002[2]	Foreign[3]	Change from 2002[2]
Assets (% of total assets)										
Cash and balances	1.39	*0.08*	1.24	*0.04*	1.62	*0.22*	2.01	*-0.05*	0.98	*-0.12*
Treasury bills	0.92	*-0.05*	0.70	*-0.02*	1.12	*-0.11*	2.78	*0.07*	0.64	*-0.13*
Loans to credit institutions	17.53	*-0.15*	18.47	*-0.01*	16.15	*-0.42*	12.77	*-0.72*	29.12	*0.89*
Debt securities (public bodies)	8.27	*1.02*	10.84	*1.47*	3.47	*0.08*	1.23	*0.04*	8.73	*-0.91*
Debt securities (other borrowers)	12.15	*0.16*	12.49	*0.07*	11.33	*0.44*	12.33	*-0.06*	9.68	*1.90*
Loans to customers	48.17	*-0.89*	44.08	*-1.29*	56.22	*-0.12*	56.89	*0.24*	38.40	*-1.12*
Shares and participating interest	3.41	*0.06*	2.99	*0.03*	4.13	*0.08*	4.92	*0.31*	2.74	*-0.48*
Tangible assets and intangibles	1.36	*-0.02*	1.30	*-0.06*	1.42	*0.08*	1.85	*-0.01*	0.91	*-0.06*
Other assets	6.59	*-0.18*	7.86	*-0.20*	4.30	*-0.20*	2.50	*0.05*	5.44	*-0.08*
Liquidity										
Liquid asset ratio 1 (cash and T-bills)	2.31	*0.04*	1.94	*0.02*	2.74	*0.11*	4.79	*0.01*	1.62	*-0.25*
Liquid asset ratio 2 (ratio 1 + loans to cred. inst.)	19.84	*-0.11*	20.41	*0.01*	18.88	*-0.31*	17.56	*-0.70*	30.74	*0.64*
Liquid asset ratio 3 (ratio 2 + debt sec. by public bodies)	28.11	*0.91*	31.25	*1.48*	22.36	*-0.24*	18.79	*-0.66*	39.47	*-0.27*
Liabilities (% of total assets)										
Amounts owed to credit institutions	23.24	*0.12*	25.23	*0.17*	20.04	*-0.01*	14.61	*-0.27*	36.91	*1.20*
Amounts owed to customers	40.46	*-0.11*	36.91	*0.18*	44.81	*-0.53*	64.11	*-0.28*	31.17	*-0.26*
Debt certificates	20.83	*-0.39*	21.41	*-0.82*	21.94	*0.39*	5.93	*-0.05*	14.27	*-0.60*
Accruals and other liabilities	7.66	*0.42*	9.06	*0.58*	4.98	*0.07*	4.22	*0.17*	6.44	*-0.26*
Fund for general banking risks	0.18	*0.00*	0.19	*0.00*	0.16	*0.00*	0.17	*0.02*	0.20	*0.01*
Provisions for liabilities and charges	1.31	*-0.02*	1.28	*-0.07*	1.41	*0.06*	1.06	*0.09*	0.77	*-0.12*
Subordinated liabilities	1.84	*-0.05*	2.01	*-0.09*	1.64	*0.02*	0.74	*0.01*	1.66	*-0.16*
Equity capital	3.67	*0.01*	3.15	*-0.02*	4.29	*0.08*	7.27	*0.12*	4.64	*-0.03*
Other liabilities	0.44	*0.01*	0.51	*0.03*	0.34	*-0.03*	0.08	*0.01*	0.19	*-0.04*
Profit or loss for the financial year	0.36	*0.03*	0.24	*0.05*	0.39	*-0.04*	1.80	*0.18*	0.44	*0.10*
Selected off-balance sheet items (% of total assets)										
Credit lines	11.77	*0.03*	13.79	*0.21*	8.15	*-0.55*	5.28	*0.57*	12.17	*0.09*
Guarantees and other commitments	5.99	*-0.16*	5.65	*-0.51*	6.99	*0.69*	4.70	*-0.27*	6.68	*0.44*

Source: Banking Supervision Committee (BSC).
1) Data mostly cover domestically-owned banking groups on a cross-border consolidated basis. However, for one euro area country, "all banks" includes foreign EU and non-EU branches and subsidiaries owing to national statistical reporting standards. This results in some double counting in the consolidated data.
2) Percentage points. Based on data for 10 countries.
3) Data covers foreign-controlled (EU and non-EU) subsidiaries and branches for 11 euro area countries.

Table S8 Euro area banks' regulatory capital ratios and risk-adjusted items

(2003)

	All banks[1]	*Change from 2002*[2]
Overall solvency ratio	11.87	*0.51*
Tier 1 ratio	8.71	*0.36*
Distribution of overall solvency ratio (risk-weighted assets as % of total risk-weighted assets)		
Overall solvency ratio < 7%	0.03	*0.00*
Overall solvency ratio 7%-8%	0.01	*-0.35*
Overall solvency ratio 8%-9%	3.84	*-0.57*
Overall solvency ratio 9%-10%	7.85	*-11.25*
Overall solvency ratio 10%-11%	27.74	*1.53*
Overall solvency ratio 11%-13%	40.56	*6.57*
Overall solvency ratio > 13%	19.97	*4.06*
Overall solvency ratio below 9%		
Number of banks	95	*-77*
Asset share (% of total banking sector assets)	0.91	*-1.61*
Risk-adjusted items (% of total risk-adjusted assets)		
Risk-weighted assets	82.02	*-0.02*
Risk-weighted off-balance sheet items	11.88	*0.05*
Risk-adjusted trading book	6.10	*-0.03*
Composition of trading book own funds requirement (% of total trading book own funds requirement under CAD)		
Own funds requirement for traded debt instruments	48.58	*1.21*
Own funds requirement for equities	9.69	*0.72*
Own funds requirement for foreign exchange risk	7.80	*-2.12*
Own funds requirement for other trading book items	33.93	*0.19*

Source: Banking Supervision Committee (BSC).
1) The overall solvency ratio and Tier 1 ratios are weighted average ratio for domestic consolidated banking groups. However, for one euro area country, this sample of banks includes foreign EU and non-EU branches and subsidiaries owing to national statistical reporting standards. This results in some double counting in the ratios. Other averages are weighted averages of data for all banks including foreign-controlled (EU and non-EU) subsidiaries and branches for all countries.
2) Percentage points. Based on data for 10 countries.

Table S9 Profitability of 50 large euro area banks

(2002-2004 H1)

		Weighted average	Min	First Quartile	Max	Third Quartile
Return on equity (ROE)	2002	6.1	-23.5	3.4	22.5	12.4
	2003	6.7	-41.7	5.2	27.6	13.8
	04H1	8.2	3.5	10.8	22.2	17.9
Cost-income ratio	2002	72.0	25.1	64.3	104.3	74.3
	2003	68.0	25.0	61.7	97.8	71.8
	04H1	61.7	38.3	57.5	87.5	69.0
Provisions (% of total assets)	2002	0.3	0.0	0.2	1.2	0.5
	2003	0.3	0.0	0.2	2.5	0.4
	04H1	0.2	0.0	0.1	1.2	0.2
Net interest income (% of total assets)	2002	1.2	0.0	0.0	0.0	0.0
	2003	1.2	-0.2	0.8	3.5	2.1
	04H1	1.1	0.1	0.5	3.1	1.1
Tier 1 ratio	2002	5.9	5.0	6.3	10.4	8.3
	2003	6.4	4.9	10.5	12.7	8.7
	04H1	7.9	5.3	7.0	10.7	8.7
Regulatory solvency ratio	2002	8.6	8.2	9.8	17.5	11.1
	2003	9.6	8.3	10.5	22.1	8.3
	04H1	9.9	9.0	10.4	14.4	12.0

Source: ECB calculations based on banks' annual accounts and interim results.

Table S10 Total and interest rate (IRR) value at risk (VaRs) of selected banks in the euro area

(% of Tier 1)

	Total VaR			IRR–VaR		
	end-2002	end-2003	mid-2004	end-2002	end-2003	mid-2004
Mean	0.47	0.50	0.73	0.33	0.37	0.61
Min	0.08	0.09	0.32	0.09	0.08	0.20
Max	0.70	0.86	1.39	0.61	0.67	1.33

Source: Banking Supervision Committee (BSC).
Note: Value at risk measures are computed under the assumption of a 99% confidence interval and a ten-day horizon. On average, the VaR figures refer to banks whose assets represent around 30% of total assets of the 7 euro area reporting countries' banking sectors. Figures are unaudited.

Table S11 Euro area banks' exposures at risk to seven aggregate sectors

(2003)

	BaC	EnU	Cap	CCy	TMT	CNC	Fin
Exposure of seven euro area countries (EUR millions), mid-2004	675,965.0	144,767.0	246,045.5	1,421,957.8	117,700.0	608,620.7	2,316,379.5
Sectoral EDF (as of May 2003)	1.04	0.26	1.85	1.465	4.95	0.89	0.19
Sectoral EDF (as of June 2004)	0.83	0.18	1.375	0.81	2.875	0.65	0.18
Change in exposure at risk (EUR millions)	-144,363.5	-128,61.1	-132,921.4	-1,179,063.7	-303,640.0	-151,512.3	132,740.8
% change in exposure at risk, 2002-2003	-20.5	-33.0	-28.2	-50.6	-47.3	-27.7	46.7

Sources: Banking Supervision Committee (BSC), Moody's KMV and ECB calculations.
Note: The data are provided by Belgium, Germany, Spain, France, Italy, Austria and Finland. The sectors are basic and construction (BaC), consumer cyclicals (CCy) and non-cyclicals (CNC), capital goods (Cap), energy and utilities (EnU), financial (Fin),and technology and telecommunications (TMT). The exposure at risk is computed by multiplying the exposure to each sector by the expected default frequency (EDF) of the same sector. The EDF is a measure of the expected probability of default for the year ahead.