



EUROPEAN CENTRAL BANK

DECEMBER 2005

FINANCIAL STABILITY REVIEW

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## PREFACE

Financial system stability requires that the principal components of the system – including financial institutions, markets and infrastructures – are jointly capable of absorbing adverse disturbances. It also requires that the financial system facilitates a smooth and efficient reallocation of financial resources from savers to investors, that financial risk is assessed and priced reasonably accurately, and that risks are efficiently managed. By laying foundations for future vulnerabilities, inefficiencies in the allocation of capital or shortcomings in the pricing of risk can compromise future financial system stability. This review assesses the stability of the euro area financial system both with regard to the role it plays in facilitating economic processes and considering its ability to prevent adverse shocks from having inordinately disruptive impacts.

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

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







## I OVERVIEW OF RISKS TO FINANCIAL STABILITY

The strength and resilience of the euro area financial system has further improved over the past six months, contributing to a positive outlook for financial stability. Nevertheless, at the same time financial imbalances have grown larger and seem likely to continue expanding, primarily at the global, but also at the euro area, level. With shock-absorption capacities improving, but risks and vulnerabilities rising, the financial stability outlook continues to rest upon a delicate balance. While the likely outcomes could, at this stage, best be described as bi-modal, a positive outcome remains the most likely prospect in the period ahead.

Continued strength in the pace of global economic growth in 2005, despite further oil price rises, low interest rates in the euro area as well as indications of further improvements in corporate sector credit quality, provided a favourable environment for financial institutions and markets. Global credit markets successfully weathered a test of their resilience in the first half of the year, prompted by the downgrading of two large US automobile manufacturers. The downgrade only resulted in a short-lived disturbance and the pricing of credit risks in the euro area financial markets generally remained very favourable. In addition, the conditions for raising funds in equity markets remained favourable, and financial market volatility stayed very low across most asset classes. In this environment, there was further and broad-based improvement in the profitability of banks, and the balance sheets of insurance companies were strengthened. In addition, key financial infrastructures – including payments systems such as TARGET, and securities clearing and settlement systems – remained robust and continued to operate smoothly.

Within the euro area financial system, the main source of vulnerability in the period ahead appears to be associated with concerns that the search for yield, which began in 2003, may have led investors to underestimate risk, pushing asset prices beyond their intrinsic value, especially in fixed income and credit

markets. To the extent that very low long-term risk-free interest rates have driven investors to seek higher expected returns in exchange for commensurately higher risks in corporate bond markets, credit derivatives and collateralised debt obligations (CDOs), pricing in these markets could prove vulnerable to any unexpected upturn in long-term interest rates. Moreover, there is uncertainty about the ways in which markets for credit risk transfer (CRT) products would function – including the settlement of complex contractual arrangements – in a stress situation. Any crowding of trades – where many investors enter into similar strategies – in these markets could further aggravate their vulnerability.

Concerning the sources of risk and vulnerability outside the euro area financial system, large and growing global financial imbalances continue to pose medium-term risks to the stability of foreign exchange and other financial markets, especially bond markets. By raising costs, the further surge in oil prices over the past six months could dent future corporate sector profit growth, if it proves to be as lasting as futures prices currently suggest. Concerns also remain about the credit and wealth risk implications of rising household sector debt and house prices in some euro area countries.

It should be stressed that calling attention to sources of risk and vulnerability to financial stability such as these does not mean seeking to identify the most probable outcome. Rather, it merely entails highlighting 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 euro area financial system stability. The chapter concludes with an overall assessment of the outlook.

### RISKS FROM GLOBAL FINANCIAL IMBALANCES

Because of the pressure they place on global capital markets, the magnitude of capital flows

required to finance the large and growing US current account deficit continues to pose risks for global financial stability. In 2005, the US current account deficit is widely expected to reach more than 6% of US GDP, a new post-Bretton Woods record. The prolonged accumulation of expanding deficits means that the US has become the world's largest international debtor. While there have been concerns about the medium-term sustainability of the US external position, this ultimately depends upon the ability and willingness of external investors in surplus economies to continue financing the US deficit. So far, there has been little indication of any financing challenges or diminished willingness on the part of foreign investors to increase their holdings of US assets.

Overall, sight should not be lost of the fact that there are two sides to the significant widening of global imbalances since 2000. Significant capital inflows into the US have been mirrored by outflows from surplus economies in Asia, especially China and Japan, and, more recently, from oil-exporting countries, which have benefited from the surge in oil prices. The foreign exchange reserves accumulated by some Asian economies have continued to be recycled into the US bond markets. This appears to have underpinned a further widening of US imbalances, thereby delaying any adjustment, and contributing to holding US long-term interest rates down.

Looking ahead, several factors suggest that global imbalances could yet widen further. These include the recent strengthening of the US dollar, the robust pace of US economic activity, and the recent further rise in oil prices. Within the US, the main sources of domestic savings-investment imbalances for much of the time since 2000 have been growing fiscal imbalances and heavy household borrowing. Given the costs associated with Hurricane Katrina, it seems unlikely that the fiscal deficit will significantly contract in the period ahead. At the same time, the US household sector savings rate reached very low levels in recent

months, and it cannot be excluded that corporate sector financing surpluses could soon turn negative, as firms may be encouraged to increase leverage.

As far as risks from these large and growing global imbalances are concerned, their sustainability appears to be closely connected with the ability and willingness of foreign investors – both official and private – to augment their holdings of US dollar assets still further. From a financial stability viewpoint, if concerns were to surface that overseas demand for US dollar assets could slow markedly, the likelihood of a disorderly rebalancing would increase, involving capital account adjustment. This could bring with it the possibility of significant downward pressure on the US dollar, coupled with significant upward pressure on long-term interest rates which could spill over into other financial asset classes. A positive development in this respect was that the decision of the Chinese authorities to introduce greater exchange rate flexibility in July 2005 did not appear to lead to expectations that Asian central banks would diversify the currency composition of their reserves out of US dollars in the short term. Indeed, the reform did not have any lasting effect on the major exchange rates. Nevertheless, if the recent further widening of global imbalances is not corrected over the medium term, important risks will remain.

## RISKS IN GLOBAL CAPITAL MARKETS

In the course of 2003, long-term bond yields in the US and the euro area dropped to very low levels, and exhibited little discernible trend thereafter. Initially, low short-term interest rates had encouraged “carry trades” – where funds are borrowed for the short term and invested in long-term maturity instruments – along market yield curves, apparently contributing to the decline in yields. However, despite widespread fears of a repeat of the turmoil that occurred in global bond markets in 1994, the measured and broadly anticipated

increases in the US Federal Funds rate from June 2004 onwards only had a relatively limited impact on pricing in the fixed income markets. Even though the tightening of US monetary policy seemed to prompt an orderly unwinding of these leveraged positions, US long-term nominal interest rates still remained well below consensus expectations for nominal GDP growth over the same horizon. The resilience of pricing in the fixed income markets to changing fundamentals was also notable in view of the strength of global economic activity, growing twin (fiscal and current account) – deficits, and institutional investor surveys that persistently revealed concerns about the possibility of an abrupt upturn in long-term bond yields.

Several potential explanations have been advanced for the very low level of global long-term interest rates. Foremost among these has been the credibility of monetary policy in delivering low and stable rates of inflation. In addition, as far as the US is concerned, another factor has been strong official sector demand for US assets, particularly in Asia; and high levels of global saving, especially in emerging market economies (EMEs) and in the corporate sectors of mature economies. Turning to the euro area, an additional factor has been the demand for fixed income assets by institutional investors eager to close balance sheet mismatches, a portfolio reallocation stimulated by recent regulatory and accounting changes. In addition, the strength of oil prices is thought to have played a role in pushing down global bond yields, both by lowering global growth expectations and through a recycling of expanding revenues of oil-exporting countries into fixed income assets. While it remains difficult to gauge the relative importance of these influences on the pricing of long-term bonds, a pick-up in external funding by the corporate sector, for instance, or a move by Asian central banks to diversify the currency composition of their foreign external reserve portfolios, could trigger an upturn in long-term yields.

Regardless of the causes, the consequences of low long-term interest rates have been clear. By flattening market yield curves, low long-term interest rates encouraged financial market investors to seek higher returns with commensurately higher risk in credit and emerging markets. While improving fundamentals undoubtedly played an important role in compressing spreads in markets for corporate and emerging market bonds, there have been some concerns that very low interest rates and abundant liquidity may have led investors to perceive risks as being very low and/or to accept less compensation for holding risky assets. Lower returns on risk-free assets is thought to have favoured substantial growth in markets for complex and leveraged instruments such as credit derivatives and CDOs, and in the global hedge fund industry. While these developments can be seen as positive for market efficiency and liquidity, there are uncertainties about the ways in which markets for credit risk transfer products would perform in a stress situation. Any crowding of trades in these markets, especially by hedge funds, could aggravate their vulnerability.

Low long-term interest rates and the search for yield also seem to have had consequences for non-financial sectors and financial institutions in the euro area. It allowed firms to restructure debt, thereby improving credit quality, and it appears to have supported the strength of mortgage lending, both of which have favoured the financial condition of euro area banks. However, to the extent that the search for yield has more broadly pushed asset prices above their intrinsic value, this may have sown the seeds of future vulnerability for financial institutions, especially as it implies that investors may have underestimated risks. Hence, financial institutions, including euro area banks, that hold fixed income and credit securities may yet face greater than normal market risk.

Looking ahead, not withstanding the successful weathering of a well anticipated credit event in the first half of 2005 by credit

markets, there is no room for complacency as 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 broad-based reappraisal of credit risks, could pose strains and widen spreads in corporate bond and credit derivatives markets. Even though long-term rates in the euro area have remained close to nominal growth expectations and therefore do not appear to represent an independent source of vulnerability, risks could still arise through correlation between US and euro area long-term bond yields, which tends to be very high at times of market stress. The vulnerability of pricing in credit markets to reappraisal was recently demonstrated in early May 2005 when the widely expected downgrading of two large US automobile manufacturers led to some dislocation in structured credit markets and losses for some hedge funds. While the turbulence passed quickly and credit markets proved to be resilient, the incident highlighted the dependence of pricing in credit derivative and CDO markets on relatively untested assumptions about default correlations. Although no clear signs have yet emerged as corporate earnings growth has remained relatively strong, these markets may yet be tested by further credit events similar to those seen in May when the credit cycle, which is relatively mature, begins to show signs of turning.

#### **EXPOSURES TO EURO AREA NON-FINANCIAL SECTORS**

An evaluation of the credit risks posed by firms and households depends upon both the nature of the exposures of banks and financial market participants – including investors in corporate bonds and participants in CRT markets – and balance sheet conditions in the two sectors. Over the past six months, private sector balance sheet conditions in the euro area have continued to diverge, with firms continuing to strengthen their balance sheets, but households expanding their balance sheets further.

A further strengthening in the profitability of firms, together with ongoing debt restructuring efforts, has contributed to improving the condition of euro area corporate sector balance sheets still further over the past six months. Moreover, in an environment in which interest rates remained very low, the debt financing burdens of firms generally remained contained. Even though corporate debt-to-GDP ratios rose somewhat in early 2005, there was an across-the-board improvement in traditional indicators of corporate sector creditworthiness – including better credit ratings, tight spreads on corporate bonds, lower expected default frequencies, and an overall easing of banks' credit standards on the approval of loans to enterprises in the first half of 2005. Credit assessments improved for both large and small enterprises, although to a far lesser extent for the latter.

Notwithstanding the relatively benign outlook, there are some risks and vulnerabilities facing firms in the period ahead. Uncertainties surrounding the broad economic outlook have increased somewhat over the past six months, primarily owing to the further rise in oil prices. This has cut into analysts' expectations of future corporate sector profit growth. Although at this stage there is uncertainty about the prospect of a general turn in the credit cycle, the profit cycle has shown some signs of maturing. In particular, while rates of profit growth have been strong, in some more domestically oriented sectors, there was a marked slowdown in the course of 2005. An unexpected disturbance to future profit growth or increase in leverage would most likely translate into higher corporate sector credit risk. In addition, while balance sheet and debt restructuring has generally contributed to improving the creditworthiness of the corporate sector, there are some concerns that firms have shortened the effective maturities of their debts, thereby making balance sheets more interest rate-sensitive.

As rates of lending growth to households have strengthened further, euro area household

sector indebtedness has continued to rise, prompting questions about sustainability and the degree of credit risk that banks face. Ultimately, the sustainability of household sector indebtedness depends on the ability of households to service outstanding obligations out of income and, if necessary, assets in case of adverse disturbances to income. In this respect it is notable that, while climbing, household debt-to-GDP ratios have remained low by international standards; debt servicing burdens have remained stable; and aggregate household sector solvency – gauged by debt-to-financial asset ratios – has remained comfortable. There are also some indications that the most heavily indebted households in the euro area tend to be those in the highest income categories. Furthermore, the counterpart of rising indebtedness in some euro area countries has been an expansion of the asset side of household balance sheets, thanks primarily to further house price appreciation.

Looking ahead, the risks facing the euro area household sector include risks to household incomes, as well as interest rate risks and, in some countries, house price risks. Concerning risks for household incomes, there are some uncertainties surrounding the euro area economic outlook which, if they were to crystallise, could have implications for employment prospects and household disposable incomes. As for interest rate risk, the greater part of this is borne by banks rather than households, as the bulk of mortgage contracts in the euro area are agreed at fixed rates or quasi-fixed rates.<sup>1</sup> Hence, it is unlikely that, on aggregate, an unexpected disturbance to interest rates would diminish the strength of aggregate household balance sheets to the point of significantly raising the credit risks faced by banks across the euro area. Nevertheless, the interest rate risks facing households are not evenly spread across the euro area, given differences across countries in terms of debt levels, contractual interest rate variability, and typical loan maturities. As for exposures to the risks of property price reversals, banks appear, by and large, to have carefully managed the

risks to collateral behind mortgages by setting loan-to-value ratios at conservative levels, even though signs of intensifying competition in mortgage markets may have led to a loosening of credit standards. This means that households would probably bear the brunt of any property price reversal. The implications for financial stability would ultimately depend upon the strength of any wealth effect on household consumption. Since some of the countries that have experienced substantial increases in house prices in recent years are ones where the preponderance of variable rate debt is high, this may amplify the effect of any interest rate changes, especially for households with high levels of outstanding debt, low housing equity, low financial asset buffers and/or uncertain employment and income prospects.

#### PERFORMANCE OF THE EURO AREA BANKING SECTOR

Consolidating upon the recovery in euro area banking sector profitability that began in 2003, there was further broad-based improvement in 2004, including among national banking sectors that had significantly underperformed euro area averages in previous years. Moreover, the financial results of large euro area banks suggest that profitability strengthened further in the first half of 2005, although these results should be interpreted cautiously in view of the introduction of International Financial Reporting Standards (IFRS) at the start of the year. All in all, these improvements in performance were notable in view of the continued sluggishness in the pace of euro area economic activity. The factors driving the improvement in the profitability of banks included significant growth in lending to households, mostly for housing purposes, and an incipient recovery in lending to the corporate sector, including to small and medium-sized enterprises (SMEs). Marked reductions in loan loss provisioning also

<sup>1</sup> Some mortgage contracts have periods of fixation that are shorter than the term of the contract.

contributed to this improvement. All in all, given stronger profitability and with solvency ratios remaining broadly unchanged at comfortable levels, the shock-absorbing capacity of the euro area banking sector has improved.

Looking ahead, the profitability of euro area banks is expected to improve further, benefiting from generally benign credit and liquidity conditions. However, notwithstanding the recent improvement in profitability and the generally favourable outlook, there are some risks and vulnerabilities that the euro area banking sector could face in the period ahead. Some of these vulnerabilities lie within the banking system. Banks have faced challenges over recent years in maintaining, or increasing, interest income because of margin erosion, driven by persistently low interest rates and the strength of competition from their peers regarding the granting of loans. Hence, there is a risk that banks may have started to loosen their credit standards, thereby possibly increasing their future exposure to credit risk, or that they have sought out alternative, possibly riskier, sources of income. A further risk is that historically low provisioning for loan losses could prove inadequate in the face of an unexpected deterioration in the economic outlook, even though provisioning patterns in most countries have reflected readjustments from greater than normal levels, credit risk has improved, and coverage ratios have increased.

The most prominent sources of risk and vulnerabilities outside the banking sector appear to be further oil price increases as well as the risks posed by large and growing global imbalances. Although the direct exposures of euro area banks to these sources of risk are likely to be limited, if such risks were to crystallise, they could manifest themselves indirectly in increasing credit risk as the financial condition of non-financial sectors deteriorates. Concerning the interest rate risks faced by banks, the risk of an abrupt upturn in long-term bond yields, while not priced into

market yield curves, has continued to be priced into options markets as a low probability event. If this risk were to crystallise, banks could be exposed to greater market risks than normal, including the possibility of capital losses on fixed income securities – especially if it were to trigger a reassessment of the appropriateness of pricing in credit markets. However, banks also face risks if long-term interest rates were to remain low for a protracted period, especially if yield curves were to flatten, since this would increase the challenges facing the sector in generating interest income from core business. Moreover, as low interest rates may have sustained tight credit spreads, to the extent that banks' pricing of credit risks is market-sensitive, longer-term vulnerabilities could be building up. These vulnerabilities would be exposed in the event of an upturn in long-term interest rates or an unexpected credit event.

Forward-looking indicators based on asset prices generally suggest that the outlook for the euro area banking sector remains bright. The performance of banks' stock prices over the past six months suggests that market participants expect further improvements in profitability. This outlook is confirmed by private sector analysts' forecasts of future banking sector profitability, as well as by patterns in banking sector credit risk indicators. Nevertheless, some options market-based indicators point towards increasing uncertainty about the outlook for banking sector profitability. However, the message emerging from market-based indicators should always be interpreted with caution owing to the possibility of pricing misalignments.

## PERFORMANCE OF THE EURO AREA INSURANCE SECTOR

Profitability in the euro area insurance industry improved further in 2004, driven mainly by strong underwriting results. Investment income, however, continued to be subdued in an environment where interest rates remained very low. Capital bases improved in both the

non-life and reinsurance industries in 2004, whereas indicators of solvency in the life insurance industry remained largely unchanged. Looking ahead, by late 2005 the outlook for the euro area insurance sector seemed broadly favourable, although market-based indicators did not reveal a clear picture concerning market participants' assessment of the risks facing the insurance sector, thereby calling for ongoing monitoring and surveillance.

The main risk facing the insurance industry relates to uncertainty about the likely future path of global and euro area long-term interest rates. The persistently low level of long-term interest rates has continued to impose strains both through the valuation of future liabilities and, for some life insurers which have raised their holdings of fixed income assets, by impinging on investment returns. For these firms, a rise in long-term interest rates would most likely lead to significant balance sheet strengthening. Concerning individual sub-sectors, the prospects for the euro area life insurance industry have been improving. Decisions taken by some Member States to offload pension funding from fiscal budgets are likely to promote the pension business of the life insurance industry. The outlook for the non-life insurance industry in the euro area also appears broadly positive: the risk of a significant decline in premium prices appears contained in the period ahead, as investment income should remain modest given the current low investment return environment. Moreover, premium written should expand further as the pace of economic activity picks up. As for the reinsurance sector, underwriting results for 2005 are generally expected to be strong, with premium prices declining only slowly. In the period ahead, owing to important claims from Hurricane Katrina, reinsurance premium prices may halt declining and possibly even increase slightly, depending on the final amount of capital depletion in the sector worldwide. In the euro area, the losses incurred by reinsurance from the hurricane are expected to only dent capital positions.

## OVERALL ASSESSMENT

Continuing strength in the pace of global economic activity in 2005, together with a further strengthening of the balance sheets of large euro area firms and financial institutions, has contributed positively to the financial stability outlook of the euro area, despite further oil price rises. However, several potential risks and vulnerabilities have grown in importance in the past six months. Within the financial system, despite recent improvements, the durability of banking sector profitability could be tested in the period ahead, especially if long-term interest rates remain low for a protracted period. Declining loan loss provisioning flows could also adversely affect the ability of banks to cope with unforeseen disturbances. Although financial markets successfully weathered a well anticipated credit event in the first half of the year, this should not lead to complacency: the possibility still exists that a reappraisal could take place with regard to far-reaching market risks stemming from the aggressive search for yield that began in the course of 2003. This has left some financial markets and institutions vulnerable to changes in global liquidity conditions and unexpected credit events. A disorderly correction in the level of long-term yields could potentially disrupt the intermediation of funds through global capital markets, which would have implications for the euro area. Moreover, some euro area financial institutions, including banks, would likely endure losses – at least in the short term – from any upturn in long-term interest rates. On the other hand, the life insurance industry would most likely benefit as this would help in relieving remaining balance sheet vulnerabilities.

Looking ahead, the risk of an abrupt unwinding of global imbalances remains, especially because these imbalances may yet widen further. It also cannot be excluded that further oil price increases could test the resilience of firms' balance sheets, especially those of SMEs. Household balance sheets may also be vulnerable in countries where house prices seem to have risen beyond their intrinsic value.







## II THE MACRO-FINANCIAL ENVIRONMENT

### I THE EXTERNAL ENVIRONMENT

*Although the pace of global economic activity has remained strong, large and growing financial imbalances continue to pose risks for global financial stability. There are several factors that suggest that global imbalances could widen further in the period ahead. These include the recent strengthening of the US dollar, the stronger pace of US growth compared with its trade partners, and the further rise in oil prices. From a financial stability viewpoint, if concerns were to surface that overseas demand for US assets could slow markedly, this could entail the possibility of severe downward pressure on the US dollar, coupled with significant upward pressure on long-term interest rates that could spill over to other financial asset classes. While foreign investors have shown no signs of reluctance to increase their holdings of US assets, important risks will remain if the recent further widening of global imbalances is not corrected over the medium term.*

#### 1.1 RISKS AND FINANCIAL IMBALANCES IN THE EXTERNAL ENVIRONMENT

In the first half of 2005, the pace of global economic activity remained vigorous and proved resilient to further oil price increases. Growth was particularly robust in the US, notwithstanding increasing policy interest rates, as well as in some countries in non-Japan Asia. While the outlook for global growth remains favourable, some risks do remain, including those posed by large and widening global financial imbalances and the further increases in oil prices over the past six months.

#### US CURRENT ACCOUNT AND FINANCING

The magnitude of capital flows required to finance large and growing US current account deficits has continued to pose significant risks for global financial stability. With the prolonged accumulation of these deficits, questions remain about medium-term sustainability, thereby posing a potential source of vulnerability for global currency

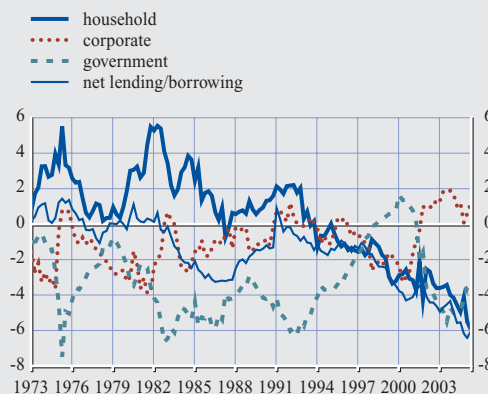
markets that could also spill over to other financial asset classes. The possible crystallisation of these risks mainly depends on the willingness of foreign investors, both official and private, to increase their holdings of US securities. As US external imbalances may yet expand further – given the recent US dollar appreciation, faster growth in the US than in many of its major export markets, and rising oil prices – pressure on the international capital markets is likely to remain.

In the first half of 2005, the US current account deficit continued to expand. After reaching new post-Bretton-Woods records of 6.5% of GDP in the first quarter of 2005, it decreased to 6.3% of GDP in the second quarter. For much of the time since 2000, the main domestic sources of the US current account deficit have been growing fiscal imbalances and heavy household sector borrowing. However, rather atypically, the corporate sector – including both financial and non-financial firms – has enjoyed a financial surplus since the last quarter of 2001 (see Chart 1.1).

Notwithstanding the further widening of the US current account deficit, there has been no

**Chart 1.1 Net lending/borrowing of the US economy**

(Q1 1973 - Q2 2005, % of GDP)



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

evidence of financing difficulties. In the second quarter, US-owned assets abroad, which amounted to USD 250.8 billion, were more than sufficient to finance the deficit of USD 195.7 billion. While foreign official inflows continued to diminish in importance in 2005 in overall portfolio investment, looking ahead, at least in the near term, there are few signs of diminishing willingness on the part of foreign investors to increase their holdings of US securities.

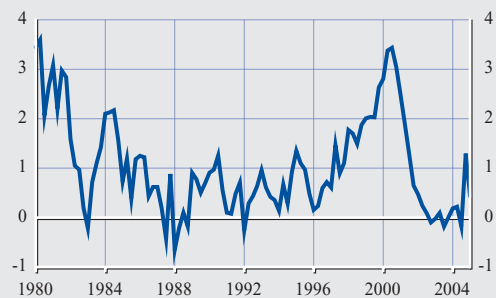
### US CORPORATE SECTOR BALANCES

The strength of US corporate sector balance sheets can have a bearing on euro area financial stability, as many euro area financial institutions have direct exposures to US firms through lending. Furthermore, the financing needs of US corporations may affect the 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 sector credit and equity market risks.

Against a background of robust economic growth, US corporate sector profitability strengthened further in the first half of 2005, and especially in the non-farm, non-financial corporate sector, which represents the bulk of US corporate activity. Compared with the fourth quarter of 2001, when US non-farm, non-financial corporate profits (after corporate income taxes and after inventory valuation and capital consumption adjustments) reached a trough, by the second quarter of 2005 profits had increased by more than 40%. Furthermore, in the first six months of 2005, corporate sector cash flows also strengthened as dividend payout ratios fell back from the very high levels observed in the final quarter of 2004 – a rise which was mostly explained by a one-off dividend payout made by a large information technology firm. Indeed, the improvement in internally generated funds, in conjunction with a deceleration in fixed investment spending, led the non-farm, non-financial corporate sector to a financial surplus in the second quarter of 2005 (see Chart 1.2). In the last few years, the non-farm, non-financial corporate

**Chart 1.2 US non-farm, non-financial corporate sector financing gap**

(Q1 1980 - Q2 2005, % of GDP)



Source: US Federal Reserve Board.

Note: The financing gap equals capital expenditures less internal funds and inventory valuation adjustments.

sector appears to have used an increasingly large percentage of internal funds to repurchase shares from the marketplace, this phenomenon becoming marked over the last twelve months, and in particular in the first half of 2005, when the issuance of new shares was largely surpassed by share retirements (see Chart S2 and Box 1). Some companies financed, at least in part, share buybacks with external liquidity, and the growing activity in cash-financed mergers and acquisitions (M&As) led to additional demand for funds. However, on aggregate, non-farm, non-financial corporate sector credit market debt as a proportion of GDP has remained virtually unchanged since early 2004 (see Chart S1).

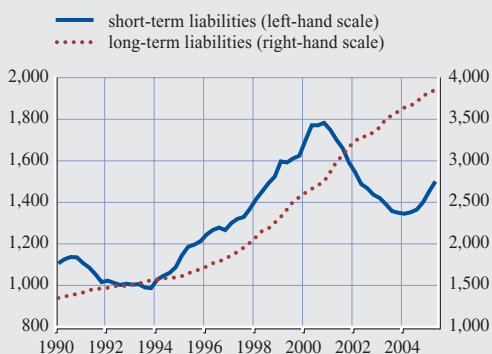
Regarding the composition and maturity profile of the debt of the US non-farm, non-financial corporate sector, there were indications that firms increased their short-term liabilities after the second quarter of 2004, while the rise in long-term credit market liabilities remained relatively stable. This was due to a shift in the composition of new credit from corporate bonds to bank loans, probably partly related to an easing of credit standards on commercial and industrial loans, as reported in the July 2005 Federal Reserve *Senior Loan Officer Opinion Survey on Bank Lending Practices*. This may also have affected commercial paper issuance which, after

picking up in the first quarter of 2005 against a background of significant improvement in the credit ratings of large US firms, decelerated in the second quarter. Notwithstanding indications of improved access to credit markets, the shift towards short-term liabilities exposes US firms to greater interest rate risk. Nevertheless, short-term indebtedness remained low compared with the long-term debt (see Chart 1.3).

Regarding the asset side of US corporate sector balance sheets, the market value of the outstanding assets of the non-farm non-financial corporate sector edged up in mid-2005 by 6.7% compared with the second quarter of 2004. This was mostly due to an increase in the market value of tangible assets.

**Chart 1.3 Credit market liabilities of US non-farm non-financial corporations**

(Q1 1990 - Q2 2005, USD billions)



Source: US Federal Reserve Board.

**Box 1**

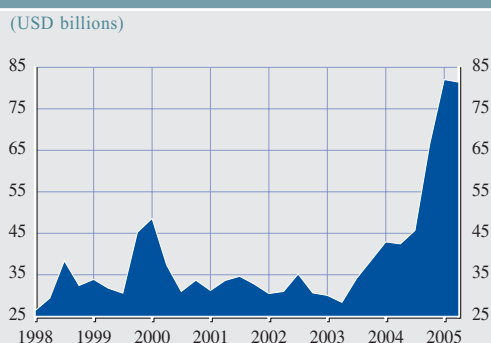
**THE RECENT SURGE IN US SHARE BUYBACKS: CAUSES AND POSSIBLE FINANCIAL STABILITY IMPLICATIONS**

From the second half of 2004 onwards, US corporations retired an extraordinary volume of equity from the market. Throughout 2004 and the first half of 2005, equity retirements in the US non-financial corporate sector exceeded gross equity issuance by USD 1,149 billion. In the first half of 2005, share repurchases by public companies listed in the S&P500 index reached a historical record (see Chart B1.1). This Box discusses some of the causes behind the surge in equity repurchases by US firms, and highlights some of the possible financial stability implications of this.

Companies decide to buy back their shares for a number of reasons. Managers may believe that their best investment option is in the company itself; they may think that the company's shares are undervalued, as a reduction in the number of shares outstanding raises expected earnings per share (EPS), thereby possibly boosting share prices; and finally, they may fear hostile takeovers. As buybacks imply a distribution of profits to shareholders, US companies have repurchased their shares in addition to, or as an alternative to, distributing dividends. Repurchased shares may be either retired, or they may be held within the company. In this case, they may be reissued for mergers and acquisitions, or to meet employee stock options (ESOs) and benefit plan obligations.

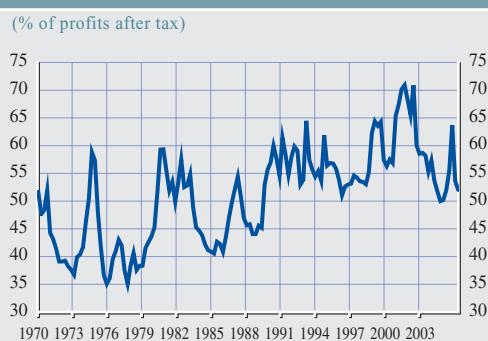
Standard and Poor's has largely attributed the recent pick-up in share repurchases to an increase in exercised ESOs and to US companies' desire to reduce their share count outstanding. Among S&P500 companies, buybacks occurred in conjunction with the greatest number of dividend increases since 1998, although on the other hand, in the US corporate sector as a whole, profits have risen at a faster pace than dividends, with the share of net dividends in after-tax profits gradually declining in recent quarters (see Chart B1.2).

**Chart B1.1 Share buybacks by S&P 500 corporations**



Source: Standard and Poor's.

**Chart B1.2 Net dividends paid out by US corporations**



Source: US Bureau of Economic Analysis.  
Note: Profits include inventory valuation and capital consumption adjustments.

Starting in the mid-1990s, the use of non-qualified ESOs to compensate labour has become increasingly common in the US. According to the US National Center for Employee Ownership, in 2003 16.3% of companies granted stock options to at least 50% of their employees. By early 2005, there were an estimated 10 million non-qualified stock option holders, with ESO plans valued at several hundred billion US dollars.

A non-qualified ESO gives the employee the right, but not the obligation, to purchase a company share at a set strike price – which typically coincides with the market price of the share on the day the option is granted – over a specific time after an initial vesting period. Companies award their employees stock options as part of their labour compensation. Options are often seen as a mechanism for increasing employee motivation and retention, as well as a way of better aligning the incentives of employees with those of the shareholders. Furthermore, options provide fiscal benefits and, until recently, accounting-related advantages.

The granting of non-qualified ESOs has led to corporate income tax savings, as the difference between share current market and strike prices when employees exercise the options is deducted from corporate income tax. Such deductions have been extremely large for firms which have made intensive use of ESOs, and whose stock prices have risen. Sullivan (2002)<sup>1</sup> estimates that US corporate tax savings from the deduction of stock options totalled around USD 56 billion in 2000, when options tax deductions exceeded net income for eight of the 40 highest market-capitalised US companies. Graham et al. (2004)<sup>2</sup> show that in 2000, stock option deductions reduced the median marginal tax rate of firms within the Nasdaq from 31% to 5%, and argue that the tax benefits associated with ESOs may help explain the recent downward trend in debt issuance by US corporations, since options tax savings may outpace the value of interest rate deductions.

Until recently, US companies were allowed to decide whether to subtract the value of outstanding ESOs from their income statement reported to the Securities and Exchange Commission – thereby reducing reported profits – or simply to note the expense in a footnote.

1 M. Sullivan (2002), "Stock Options Take \$50 Billion Bite out of Corporate Taxes", *Tax Notes*, 18 March, pp. 1396-1401.

2 J. R. Graham, M. H. Lang and D. A. Shackelford (2004), "Employee Stock Options, Corporate Taxes, and Debt Policy", *Journal of Finance*, Vol. LIX, No 4.

As a consequence, the reported profits (and EPS) of companies not expensing their options would turn out higher than the actual ones, possibly increasing the risk of asset price misalignments. Starting from June 2005, the revised Financial Accounting Standards Board (FASB) Statement No 123 requires all US public companies to recognise the value of ESOs (estimated by a single fair-value-based method – option-pricing models –) on the date of issue, and to expense it through the vesting period. In such a way, all US public companies will be forced to treat stock options uniformly, enhancing transparency and comparability of profits. Standard and Poor's estimate that the expensing of stock options would have reduced reported EPS of the companies within the S&P500 by 21.5% in 2001 and by 19% in 2002. Thereafter, following the episodes of corporate malfeasance in 2002, some firms began to expense options. Hence the underlying reported EPS of S&P 500 would have fallen by a smaller amount of 8.6% in 2003 and 7.4% in 2004.

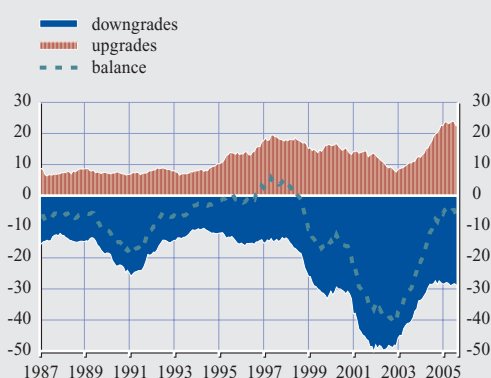
All in all, it appears that by increasing the award of stock options to pay for labour services, US companies appear to have gained some control over their reported corporate performance. Specifically, to the extent that companies have significantly improved their announced profitability, ESOs may have altered the efficient functioning of financial markets, and questioned the reliability of EPS as an indicator of corporate performance. Looking ahead, the new accounting standards may temporarily lead to smaller returns for investors should they lead to a fall in reported profits and EPS. Furthermore, should the leveraged buybacks that some companies are engaged in trigger a fall in the credit ratings of their debt, bond investors may incur unexpected losses.

Notwithstanding the general strength of the US economy, coupled with increased profitability, favourable financing conditions, balance sheet restructuring and improved solvency (as

indicated by a further decline in the liability-to-financial assets ratio (see Chart S1)), the frequency of credit rating downgrades of US corporations has remained higher than that of upgrades (see Chart 1.4).

**Chart 1.4 US corporate sector rating downgrades, upgrades and balance**

(Jan. 1987 - Sep. 2005, 12-month moving average, number)



Source: Moody's.

All in all, the strengthening of corporate sector balance sheets in the aftermath of the bursting of the equity price bubble has meant that the credit risks posed by the US corporate sector have improved considerably since early 2003. However, some risks do lie ahead. The upturn in short-term rates since mid-2004 can be expected to cut into US corporate sector profitability, especially given indications that US corporate sector balance sheets are increasingly sensitive to short-term interest rates. Recent oil price rises also pose a risk for firms' cost bases, especially if these increases prove to be lasting. Sectors particularly at risk include the already troubled energy-intensive and energy-sensitive industries such as the airline and the automobile industry.

## US HOUSEHOLD BALANCES

Rising US household sector indebtedness could, if it proves unsustainable, pose risks and create vulnerabilities for euro area financial stability. This is because some euro area banks are directly exposed to this sector, or to US credit institutions exposed to US households. Exposures also arise through holdings of mortgage-backed securities issued by US credit institutions.

Continued strength in the demand of the US household sector for credit raised debt-to-disposable income ratios to new heights in the second quarter of 2005. Mortgage credit remained the predominant source of rising household sector indebtedness, and also affected consumer credit, the growth of which has recently slowed owing to significant home equity withdrawal (see Chart S3).

Despite the rise in US household sector indebtedness, there have been few signs of financing difficulties. According to the July 2005 Federal Reserve *Senior Loan Officer Opinion Survey on Bank Lending Practices*, lending standards and terms on residential mortgages and other consumer loans remained essentially unchanged from the April survey. Meanwhile, the household debt service ratio (DSR), although at a high level relative to the early 1990s, has remained broadly stable since early 2002. The wider financial obligations ratio (FOR)<sup>1</sup> has also remained relatively stable over the same period (see Chart S4). At the same time, delinquency rates on credit card debt and auto loans have continued to decline.

The bulk of outstanding US mortgage debt is contracted at relatively low fixed interest rates following unparalleled mortgage refinancing in 2003, and is thus sheltered from interest rate increases. While the share of adjustable rate mortgages (ARMs) in new mortgages had begun to rise steadily after mid-2003, through 2005 it declined steadily from March to early September, to rebound thereafter reaching around 45% of the total loan dollar volume by end October (see Chart S5). An important

factor driving these changes was the evolution of the spread between interest rates on fixed and adjustable mortgage contracts; it narrowed until September and has widened since then. The significant proportion of ARMs in total new mortgages raised some concerns, in particular about the rising popularity of interest-only (I-O) mortgage contracts. These mortgages require very low monthly payments during the first years of the loan, because the principal is being repaid over the last few years of the contract. Whereas in 2001 only about 10% of new mortgages were contracted in this form, a significant fraction of all new mortgages extended in 2005 were thought to be interest-only. This may imply rising credit risks for mortgage lenders, as interest-only mortgages are often extended to lower-income households and because they facilitate greater leverage from borrowers (who are therefore exposed to more interest rate and house price risk). Furthermore, because they are relatively new products, the pricing of the credit risk embedded in them is challenged by the lack of sufficient data histories to conduct stress tests.<sup>2</sup>

US home prices rose on average by 13.4% between mid-2004 and mid-2005, the largest year-on-year increase since mid-1979. As this rise outstripped the growth in personal disposable income over the same period, the income-to-house price ratio – a measure of affordability – continued to decline (see Chart 1.5).

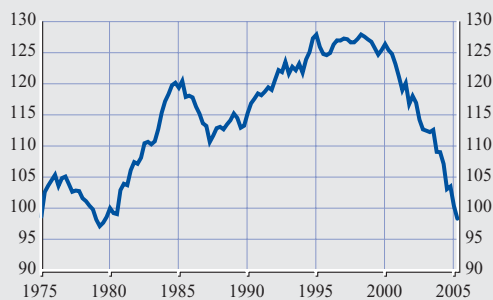
The main contributor to rising household sector asset valuations in recent quarters has been increasing home values. Moreover, despite further rises in household sector indebtedness, coupled with very low household sector

<sup>1</sup> The DSR is an estimate of the ratio of debt payments to disposable personal income. Debt payments consist of the estimated required payments on outstanding mortgage and consumer debt. The FOR, a broader measure, adds automobile lease payments, rental payments on tenant-occupied property, homeowners' insurance and property tax payments to the DSR.

<sup>2</sup> See Real Estate @ Wharton (2005), "Could Risky Mortgage Lending Practices Prick the Housing Bubble?", University of Pennsylvania, September.

Chart 1.5 US housing affordability

(Q1 1975 - Q2 2005, index: Q1 1980 = 100)



Sources: OFHEO and US Bureau of Economic Analysis.

Chart 1.6 US household net worth

(Q1 1975 - Q2 2005, % of disposable income)



Source: US Federal Reserve Board.

savings (see Box 2), surging house prices continued to produce sizeable gains in household sector net worth in the first half of 2005 (see Chart 1.6).

Overall, US households appear to face risks on both sides of their balance sheets. The strength of house price inflation – which has continued to outstrip growth in rents and disposable incomes – poses questions about US households' vulnerability to rising interest rates. On the liability side, the sustainability of increasing household sector indebtedness could also be tested by rising short-term interest rates. However, there are several mitigating factors, including further improvements in household sector net worth, stable debt servicing ratios, and very low rates of unemployment.

### US FISCAL IMBALANCES

Against a background of wide current account imbalances and very low real interest rates, large US budget deficits may pose additional risks for global financial stability. By raising the financing needs of the public sector, the strength of federal bond issuance poses not only the risk of crowding out US private sector debt issuance, but also of pressuring global real interest rates.

In 2004, the US general government deficit was 4.0% of GDP, down from 4.6% in 2003.<sup>3</sup> Hence, the debt-to-GDP ratio continued rising to 62.5% in Q2 2005, up from 57.7% at the end of 2001.

In 2005 there was a marked improvement in US federal finances which resulted from a pick up in revenues thanks to robust economic conditions, although federal spending continued to rise at a brisk pace, mainly on account of a sharp acceleration in net outlays for interest on the public debt.

Looking ahead, the US administration's budget proposals for fiscal year 2006 aim at reducing the deficit to 1.5% of GDP by 2009. If these rather optimistic expectations are met, this should contribute to easing US imbalances more generally. However, in the short term there are risks for the fiscal outlook resulting from important administration priorities, including the recent relief bills associated with Hurricane Katrina and future spending on military operations in Iraq and Afghanistan. More generally, on account of the growing structural nature of the US fiscal deficit, the fiscal outlook is likely to remain an ongoing source of concern.

<sup>3</sup> By contrast, the US federal deficit deteriorated further in 2004. It reached 3.5% of GDP, which was the largest in eleven years.

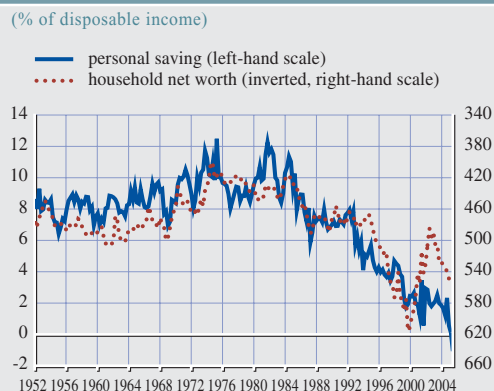


## Box 2

### FALLING SAVINGS AND RISING DEBT IN THE HOUSEHOLD SECTOR: A FINANCIAL STABILITY RISK?

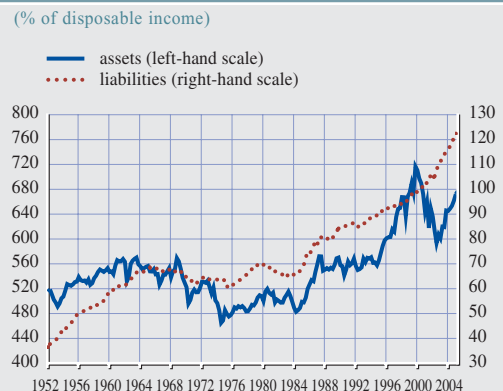
The personal savings rate in the United States has declined steadily over recent decades and fell to a negative value in the third quarter of 2005 (see Chart B2.1). At the same time, household sector indebtedness has risen to historically unprecedented heights (see Chart B2.2). Somewhat similar patterns have also been observed in other mature economies, such as Australia and Canada. These developments have occurred against a background of rising household sector net worth, an important part of which has been due to valuation gains on wealth holdings. This Box discusses some of the financial stability risks that could arise from an increased dependence on asset valuation along with any associated increase in leverage of household balance sheets.

**Chart B2.1 US household saving and net worth**



Sources: US Federal Reserve Board and Bureau of Economic Analysis.  
 Note: Household sector net worth refers to households and non-profit organisations.

**Chart B2.2 US household liabilities and assets**



Source: US Federal Reserve Board.  
 Note: Household sector asset and liability holdings refers to households and non-profit organisations and, for liabilities, also incorporates personal trusts.

Rising asset valuations may have contributed to the observed drop in savings through households' decisions related to lifetime wealth building. While the standard measure of the household sector saving rate as reported in the national accounts has fallen considerably over the past decade, it does not take into account changes in the market valuation of existing household assets. Market valuation has been influenced by higher than historical average returns on asset holdings over this period and in this way may have supported households' expectations of continued strong wealth valuation on their financial and non-financial wealth and hence weighed negatively on savings.<sup>1</sup>

Rising valuations on existing household asset holdings may also have favoured the observed strong rise in indebtedness through financial innovation and the associated availability of credit. This factor may be especially important in residential housing markets, whereby a surge

<sup>1</sup> In this sense, household wealth building can be broken down into an *active* component (the national accounts notion of the saving ratio) and a *passive* one (capital gains on existing assets). See F. Juster, J. Lupton, J. Smith and F. Stafford (2004), "The Decline in Household Saving and the Wealth Effect", *Federal Reserve Board of Governors Working Paper*, April.

in leverage has occurred owing to an expansion of homeownership – also to households which may have been credit-constrained in the past – along with enhanced access to equity built up in housing. This higher degree of leverage implies an increased sensitivity of household balance sheets to changes in asset prices.

An increased asset dependence and any associated leverage imply financial stability risks through both a direct channel (increasing credit risk for the financial sector) and an indirect channel (spillover effects from the broader macroeconomy). Concerning the direct channel, increased credit risk may arise directly given the risk inherent in leveraged acquisition of assets. In this respect, asset values can vary considerably whilst the nominal value of debt is fixed – and although household debt expansion has been roughly matched by a similar expansion in household assets, household debt has historically displayed significantly less volatility than household assets (see Chart B2.2). Any strains associated with a rapid deterioration in the value of debt collateral could be manifested in increasing default rates in the household sector, including strategic defaults. This could entail potential spillover effects to financial sector balance sheets through their exposures to household sector defaults. Concerning the indirect channel, such a spillover effect could be amplified by a deteriorating macroeconomic environment that places strains on households' ability to repay accumulated debt, possibly due higher unemployment rates or arising from a curtailing of household spending in favour of increased personal saving. In those economies where wealth valuation effects have increasingly been used as a substitute for personal saving in lifetime wealth building, a marked fall in asset values has the potential to trigger a compensatory increase in personal saving – implying a slowdown in household consumption – if households also revise downwards expectations regarding future returns on asset holdings. This in turn could have a significant effect on the economy, given the importance of household consumption in national income, thereby also possibly adding to any strain on financial sector balance sheets.

### RISKS IN NON-EURO AREA EU MEMBER STATES

The general economic outlook for non-euro area EU Member States has remained favourable in the six months following the June 2005 Financial Stability Review (FSR).

Since the beginning of the 2005, the pace of economic growth in the United Kingdom weakened, largely due to subdued domestic demand, and the Bank of England lowered its policy rate. A slowdown in private consumption growth was mainly driven by the increased cost of debt servicing, following the four interest rate hikes in 2004, and a notable deceleration in house price inflation. Against this background, mortgage lending growth appears to have stabilised, while unsecured lending growth has slowed down. While corporate sector capital gearing – the ratio of

firms' indebtedness to the market value of their assets – remained high, it has also edged down and profitability remains strong. However, the near-term outlook for economic growth has recently deteriorated, with the balance of risks tilted towards the downside, and there have been some signs of labour market easing.

In Sweden, quarterly real GDP growth accelerated in the second quarter of 2005 after a weak first quarter. In June the Swedish Riksbank cut its policy rate – for the eighth time since November 2002 – to 1.5%. In Denmark, quarterly output growth also rebounded substantially in the second quarter of 2005, after having remained subdued in the first quarter. In both countries, economic activity was mainly supported by a recovery in private consumption and investment.

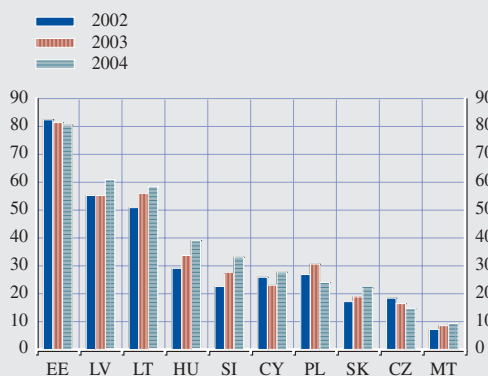
The bulk of the banks operating in the other ten non-euro area EU Member States<sup>4</sup> are owned by euro area banks. These banks are therefore exposed to credit risks arising from their lending to the household and corporate sectors in the new Member States.

In these countries, strong output growth – with the exception of Poland – and prospects of strong equity returns have attracted capital flows from abroad. For instance, since the beginning of 2005 stock market returns in all these countries except Poland and Slovenia have significantly outperformed the Dow Jones EURO STOXX Index.<sup>5</sup> These inflows, coupled with growing foreign currency indebtedness, have fuelled upward pressures on the currencies in some of the countries with flexible exchange rates.<sup>6</sup>

The proportion of foreign currency-denominated loans is important in most of the new non-euro area EU Member States (see Chart 1.7). While banks manage their direct exposures by matching foreign currency assets and liabilities, they still have indirect exposures, the importance of which depends on the ability of households and corporations to manage their foreign currency exposures. Furthermore, in those countries that witnessed brisk credit growth, the share of non-

**Chart 1.7 Share of foreign currency loans in total loans in the new EU Member States**

(2002 - 2004, % of total loans)



Source: National central banks.

performing loans in total loans ceased to decline, although it still remained rather low (see Box 3).

4 The new Member States comprise the ten countries that joined the EU on 1 May 2004: the Czech Republic, Estonia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Slovenia and Slovakia.

5 In Estonia, Lithuania and Slovakia, stock exchange indices increased by around 50%, 70% and 40% respectively since the beginning of 2005. In the Czech Republic, Hungary and Latvia, stock prices registered significant gains of around 35% in the same period.

6 The Czech koruna and the Polish zloty appreciated since the beginning of 2005 by around 2.5%. The Hungarian forint and the Slovak koruna, however, depreciated by 2.0% and 1% respectively in the same period.

### Box 3

#### CREDIT DEVELOPMENTS IN THE NEW NON-EURO AREA EU MEMBER STATES

Macroeconomic stabilisation and banking sector restructuring are two of the factors that have fostered financial sector development in several of the new EU Member States. Regulatory reforms, leading to increased competition and supply of new products have, together with improvements in domestic legal systems, also supported dynamic credit activity in these countries. In addition, favourable financing conditions, supported by low-inflation policies and higher incomes and income expectations, have encouraged strong credit demand, up from relatively low levels. This Box discusses some of the financial stability implications that could arise from the strength of credit growth in these countries.

Over recent years, credit growth to the private sector has been very robust in most new EU Member States (see Table B3.1). This growth seems to have been driven primarily by

Table B3.1 Credit to the private sector

(% per annum; period average)

	2002	2003	2004	Q4 2004	Q1 2005	Q2 2005	July 05	Aug. 05
<b>Czech Republic</b>	..	2.0	11.3	13.0	13.8	15.1	17.0	18.0
<b>Estonia</b>	23.3	26.0	27.5	30.8	31.2	32.2	34.3	35.4
<b>Cyprus</b>	7.7	6.3	5.0	5.8	5.2	4.0	4.2	4.4
<b>Latvia</b>	43.6	39.3	43.1	46.8	48.7	50.3	54.9	55.5
<b>Lithuania</b>	27.4	43.1	51.1	42.4	37.1	37.6	42.7	44.4
<b>Hungary</b>	21.5	24.2	24.7	18.5	18.2	16.8	15.1	14.5
<b>Malta</b>	1.7	4.9	12.6	9.2	7.8	6.1	4.2	4.2
<b>Poland</b>	4.6	5.4	5.2	5.0	3.5	6.0	6.5	6.1
<b>Slovenia</b>	13.4	13.3	18.8	19.3	22.9	24.3	22.9	23.7
<b>Slovakia</b>	-1.6	8.3	9.7	8.4	10.6	14.9	19.0	19.5
<b>EU-10<sup>1)</sup></b>	..	11.2	13.8	12.7	12.4	13.8	14.6	14.7
<b>euro area</b>	4.9	4.9	5.9	7.0	7.8	9.0	8.6	8.9

Sources: ECB and national central banks.

1) The EU-10 aggregate comprises the ten new EU Member States, 2003 GDP weights. EU-10 aggregate data are not included for 2002 due to a structural break in the data series of the Czech Republic.

household lending, largely in the form of mortgage lending. Annual growth in housing loans in September 2005 exceeded 30% in six new EU Member States. Mortgage lending was particularly buoyant in the Baltic countries, where growth rates above 70% were recorded. In comparison, the growth of loans to non-financial corporations has been more moderate in most countries, albeit faster than in the euro area. In many countries, the share of foreign currency-denominated loans in lending has been high and continues to grow. These loans are mostly euro-denominated, although other currencies have also been gaining in importance recently. They have been typically granted to the non-financial corporate sector, although in the Baltic countries and Poland, to households as well. Borrowing in foreign currency is mostly associated with lower borrowing costs. In addition, the bulk of borrowing in foreign currency is generally undertaken by larger multinational firms, which generate the greater part of their revenues in foreign currency, and can therefore be seen as a natural hedge. In general, borrowing in foreign currency has been more typical in those countries with fixed exchange rate regimes or exchange rate targets (particularly the Baltic countries), where borrowing had already picked up as early as the mid-1990s.

From a financial stability viewpoint, rapid credit growth deserves careful monitoring. This is because many banking crises have been preceded by episodes of rapid or excessive credit growth, although the opposite has not always held.<sup>1</sup> Several theoretical explanations exist for why credit booms tend to be associated with a higher probability of banking distress. According to one main strand of the literature, this relationship may be attributed to the procyclicality of bank lending behaviour. Risks may be underestimated during expansionary phases of the business cycle, thereby resulting in loosening credit standards and a lower average quality of borrowers. This may lead to higher credit losses when the next economic downturn occurs. Another often cited theory related to the over-expansion of credit is the “financial accelerator” mechanism. Over-optimism about future returns could boost asset valuations and thus firms’ net worth, which then feeds back into higher investment and credit demand and a further increase in asset prices. Consequently, this self-reinforcing mechanism

1 On the first point, see, for instance, D. Ottens and E. Lambregts (2005), “Credit Booms in Emerging Market Economies: A Recipe for Banking Crises?”, *DNB Working Paper* No 46, De Nederlandsche Bank, June. On the latter point, see, for instance, A. Tornell and F. Westermann (2002), “Boom-bust Cycles: Facts and Explanation”, *IMF Staff Papers*, 49 (Special Issue).

may lead to excesses in the growth of credit and asset prices. A change in expectations could then precipitate a reverse process with falling asset prices and a credit crunch, which may significantly increase repayment difficulties for borrowers and may ultimately lead to higher loan losses for banks.

When assessing the nature of credit growth in the specific case of the new EU Member States, it is important to recall that the initial depth of financial intermediation was low in these countries compared to their level of economic development. Some studies concluded that credit-to-GDP ratios in the central and eastern European and Baltic countries were significantly lower than what could be justified by their fundamentals.<sup>2</sup> Thus, rapid credit growth can, to a considerable extent, be attributed to a catching-up effect. There is as yet only limited empirical evidence on whether credit growth in the region has been excessive or not. According to recent empirical findings, there may be, at best, only a small sub-group of new EU Member States in which rapid credit expansion might have reached the proportions of a lending boom.<sup>3</sup> However, even in those countries, the pace of credit growth is not out of line with that experienced in former “converging” countries, such as Ireland or Portugal.

It is also important to bear in mind that the pace of credit growth alone may not be a sufficient guide to assess its riskiness. Considering other important aspects of credit growth in the new Member States, there are concerns that rapid credit growth expansion may have been accompanied by the build-up of some vulnerabilities, of which four main concerns can be identified. First, this may put a strain on banks’ ability to monitor and assess risks, especially because risk assessment by banks in these countries is burdened by measurement difficulties in forecasting future credit losses owing to the lack of sufficiently long credit histories. This problem may be even more pronounced in the case of previously under-served customers of banks such as households and SMEs. Second, foreign currency lending to the domestic private sector has been strong in some countries. This may have also contributed to increasing the vulnerability of households or unhedged non-financial corporations to unexpectedly large adverse exchange rate movements. Third, due to relatively moderate growth in domestic deposits, banks in some countries increasingly rely on foreign interbank borrowing to finance credit growth. This may have left these countries more vulnerable to potential changes in the current favourable external financing conditions. Fourth, since in several new Member States mortgage loan contracts typically have floating interest rates, this implies that rising interest rates would weigh mostly on households’ debt servicing ability in those countries.<sup>4</sup>

There are, however, some mitigating factors. Credit risk is contained by the fact that the ratio of debt servicing burdens of firms and households relative to income remains considerably lower in these countries than in the euro area. Moreover, a favourable growth outlook and improving income prospects owing to continuing real convergence as well as a low interest rate environment are likely to support the debt servicing ability of private sector borrowers. Some comfort can also be drawn from the fact that a strengthening of banks’ profitability in most new Member States has helped to maintain a solid capital base, thereby helping to increase banks’ shock absorbing capacity. With regard to asset quality, the ratio of non-performing loans

2 See, for instance, C. Cottarelli, G. Dell’Ariccia and I. Vladkova-Hollar (2003), “Early Birds, Late Risers, and Sleeping Beauties: Bank Credit Growth to the Private Sector in Central and Eastern Europe and in the Balkans”, *IMF Working Paper* No 03/213.

3 P. Hilbers, C. Pazarbasioglu, G. Johnsen and I. Ötger (2005), “Assessing and Managing Rapid Credit Growth and the Role of Supervisory and Prudential Policies”, *IMF Working Paper* No 05/151.

4 See ECB (2004), “Aggregated EU Household Indebtedness: Financial Stability Implications”, *Financial Stability Review*, December, pp. 147-153.

decreased or remained at a low level in most countries. It should be stressed, however, that banks' asset quality indicators are typically backward-looking. Since risks may build up during boom phases, a deterioration in credit quality might only become visible with a significant time-lag if general economic conditions were to worsen. As most new Member States have been enjoying relatively high rates of economic growth in recent years, the resilience of loan portfolios to negative output shocks remains untested up to now.

### SOURCES OF RISKS AND VULNERABILITY IN EMERGING MARKETS ECONOMIES

An evaluation of the risks posed by emerging market economies (EMEs) for euro area banks and investors in these countries' capital markets depends upon both the nature of their exposures and financial imbalances within and across EMEs. Risks to euro area financial stability stemming from EMEs appear to be contained in the short term on two grounds. First, the overall economic outlook for EMEs as a group remains positive. Although economic activity across EMEs showed signs of moderation in 2005 – except in China – the pace of growth remained robust. Coupled with a still favourable external environment, this led to a further improvement in standard EME vulnerability indicators (see Table S1). Second, the emerging market share in the total consolidated exposures of euro area banks – the most direct channel through which the euro area banking system may be affected – remained stable and limited at under 25% in Q1 2005 (or 17.0% excluding offshore centres, see Table S3).

However, although limited in nature, risks from EMEs appear to be more skewed towards the downside since the June 2005 FSR, especially in the short to medium term. Three main risks to the emerging market outlook may be identified. First, in the short term, EMEs remain vulnerable to sudden shifts in global liquidity. EME bond spreads have benefited from the hunt for yield in global financial markets and, if global long-term government bond yields were to rise, they would probably face a tightening of financing conditions (see Chart 1.8). So far EME bond spreads have proven resilient to a slight rise in US Treasury

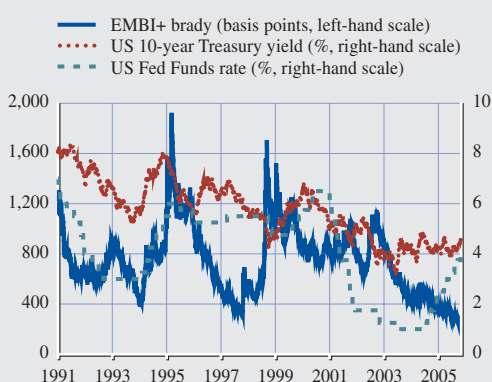
yields. However, they could be tested in the event of a sharper and more pronounced rise.

Second, inter-regional and intra-regional differences in economic performance across EMEs are likely to be accentuated by rising international energy prices amid a less dynamic evolution of hitherto compensating factors for a higher energy-related bill (such as non-fuel commodity exports for some EMEs). And third, external demand could be more sluggish than currently anticipated.

Region or country-specific risks also remain a matter of concern. Among the emerging regions neighbouring the euro area, these risks include a credit boom in south-eastern European economies, which in some cases are combined with high current account deficits. In Latin America, vulnerabilities stem mostly from the political realm, including a major political

**Chart 1.8 Emerging market bond spreads relative to US short and long-term interest rates**

(Jan. 1991 - Nov. 2005)



Sources: JP Morgan Chase & Co. and Bloomberg.

scandal in Brazil (the largest international issuer of sovereign bonds among the EMEs) which might evolve into a governance crisis, continued instability in some Andean countries, and a heavy electoral cycle including presidential elections in major economies in 2006. In emerging Asia, risks include the possibility that excessive curbs in investment could lead to a sharp slowdown in growth in China, although there are as yet few indications of this.

### EMERGING MARKET ECONOMIES AND GLOBAL IMBALANCES

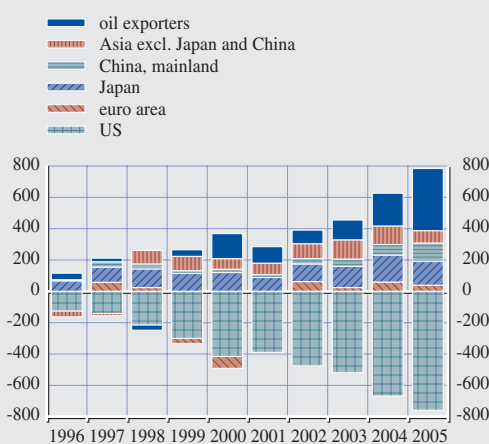
In the medium term, risks to euro area financial stability stemming from emerging markets are primarily associated with the potential for a disorderly correction of current account positions worldwide. With regard to the role played by EMEs in the widening of global imbalances, three elements are relevant. First, the main counterparts of the large and growing US current account deficits have been large surpluses in Asia – especially China and Japan – and increasingly in oil exporting economies, including many EMEs as well (see Chart 1.9). The current account surplus in China alone is expected to widen to over USD 115 billion, which could amount for as much as 15% of the US deficit for 2005.

Second, although some exchange rate adjustment has taken place in the six months since the June 2005 FSR, it has been mixed. The exchange rate policy framework in China and Malaysia was significantly reformed at the end of July 2005 (see Box 4). However, in practice the appreciation of both the renminbi and the ringgit was contained to little more than the initial 2% that followed these changes. Upward pressures on other Asian currencies – which were significant in some cases during H1 2005 – largely subsided in the wake of the Chinese policy reforms, although this also reflected concerns about the impact of higher oil prices on the pace of economic activity in the region.

Third, reserve accumulation in China continued unabated in the year to September 2005 at USD 159 billion, up from USD 111 billion over the same period in 2004 (see Chart 1.10). Reserve accumulation remained higher than the sum of the trade balance and foreign direct investment (FDI), indicating significant speculative capital inflows into the country betting on a renminbi appreciation. Although this gap has narrowed in recent months, the extent to which the Chinese authorities can contain speculative capital inflows will continue to be an important

Chart 1.9 Global current account positions

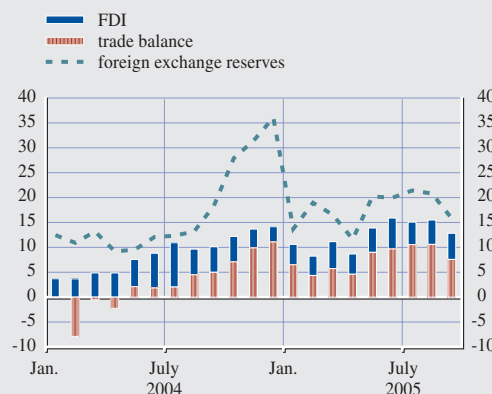
(1996 - 2005, USD billions)



Source: IMF (WEO database).  
Note: 2005 figures are IMF projections.

Chart 1.10 China monthly foreign exchange reserve increase, trade balance and FDI

(Jan. 2004 - Sep. 2005, USD billions)



Source: CEIC.

determinant behind the country's foreign exchange reserve build-up.

Overall, sight should not be lost of the fact that there are two sides to the widening of global imbalances insofar as EMEs are concerned. EMEs have been one of the sources – but not the only source – of the build-up of global imbalances in recent years. In particular, relatively stable exchange rates in many Asian economies (including emerging ones) vis-à-vis the US dollar have been associated with large current account surpluses that have mirrored the growing US deficit in recent years. In addition, the strategy of reserve accumulation,

which has underpinned monetary and exchange rate policies in Asia, has helped in preventing a more pronounced upward adjustment in mature economy long-term government bond yields. However, the difficulties inherent in sustaining the pace of reserve accumulation of recent years and the delicate equilibrium between current account surplus and current account deficit regions worldwide implies that EMEs are also vulnerable to a disruptive unwinding of global imbalances. In this case, risks to EMEs might be associated with disruption in global capital markets, tighter financing conditions, and, possibly, more sluggish demand from mature economies.

#### Box 4

##### THE REFORM OF THE RENMINBI EXCHANGE RATE REGIME

Against a background of large and growing global financial imbalances and concerns about the associated risks for global financial stability, international pressure mounted on the Chinese authorities to adopt a more flexible exchange rate regime in order to help curb growing global current account imbalances and to alleviate upward pressure on more flexible international currencies. Many analysts also expected that any revaluation of the Chinese currency would trigger greater exchange rate flexibility in other Asian countries. On 21 July 2005, the renminbi was revalued by 2% against the US dollar, from 8.2765 to 8.11, and the Chinese authorities announced that they had moved to a “managed floating exchange rate regime based on market supply and demand with reference to a basket of currencies”. However, since the reforms, the renminbi has continued to be tightly managed against the US dollar, so that little impact on the scale of global imbalances can be expected in the short term.

The Peoples Bank of China (PBC) has emphasised that managing the exchange rate “with reference to” a basket of currencies does not mean that the renminbi will be pegged to a basket of currencies. The objective of the new regime is to keep the renminbi exchange rate basically stable at an adaptive equilibrium level. While the weights of the currencies in the reference basket were not disclosed, the currencies were selected mainly on the basis of the relative shares of China's trading partners in goods and services. However, other variables considered included the sources of FDI into China and the currency composition of Chinese debt. The currencies with the highest weight in the basket are the US dollar, the euro, the Japanese yen and the Korean won. Other currencies in the basket include the Singapore dollar, the UK pound sterling, the Malaysian ringgit, the Russian rouble, the Australian dollar, the Thai baht, and the Canadian dollar. Under the new regime, the PBC announces at the end of each working day the closing price of the foreign currencies traded against the renminbi in the interbank market. This closing price then serves as the central parity for trading against the renminbi on the following day. As in the past, the daily trading price of the US dollar against the renminbi is allowed to float within a  $\pm 0.3\%$  band around the central parity announced each day; however, the daily trading band of the renminbi against non-US dollar currencies has twice been widened to the current  $\pm 3.0\%$ .



**Chart B4.1 Intraday renminbi exchange rate against the dollar**

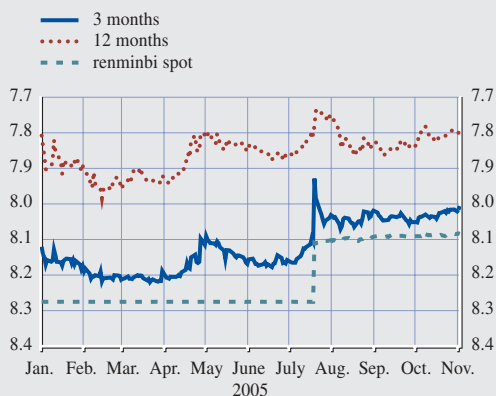
(index: 21 July 2005 = 100, upward movement = appreciation of the renminbi)



Source: Bloomberg.

**Chart B4.2 RMB/USD non-deliverable forwards**

(inverted scale)



Source: Bloomberg.

Since 21 July 2005, the PBC has continued to manage the exchange rate tightly, and movements of the renminbi against the US dollar have remained well within the statutory bands (see Chart B4.1). Thus, although the new regime technically creates room for further market-driven appreciation, the renminbi had, as of early November 2005, appreciated by a maximum of 0.3% against the US dollar in addition to the initial one-off revaluation. The management of the transition to a more flexible regime had raised concerns for financial stability in China, in particular with regard to the possibility that the revaluation would be perceived as being insufficient by the markets, possibly precipitating expectations of further revaluation and triggering an increase in speculative capital inflows. So far the Chinese authorities appear to have been relatively successful in managing market expectations of a further renminbi appreciation, and these expectations have actually receded since the initial revaluation (see Chart B4.2). By early November, the non-deliverable forward market was pricing in a 0.97% appreciation of the renminbi against the US dollar over the following three months, and a 3.6% appreciation over the following 12 months.

Foreign exchange reserves have, however, continued to grow at a monthly rate of around USD 20 billion since July, indicating that intervention by the PBC has remained substantial in the aftermath of the reforms. In spite of this, and unlike patterns seen in 2004, most of the increase in reserves was accounted for by a surge in the trade surplus and not by non-FDI and non-trade-related inflows (a proxy for speculative inflows).

As of early November 2005 the Chinese reforms have had little impact on exchange rates in the rest of the region, with most other currencies remaining either relatively stable or continuing to depreciate against the US dollar against a background of declining trade surpluses and concerns about the impact of high oil prices on their economies.

## 1.2 KEY DEVELOPMENTS IN INTERNATIONAL FINANCIAL MARKETS

### FOREIGN EXCHANGE DEVELOPMENTS

Notwithstanding a further widening of the US current account deficit, there was a broad-based appreciation of the US dollar in the first half of 2005 (see Chart S11), supported by higher money market interest rates and continued signs of robust economic growth. After a period of broad weakness between July and early September, the US dollar continued to strengthen in October.

A persistent issue for foreign exchange rate markets has been the extent to which Asian authorities have remained active in preventing their currencies from appreciating vis-à-vis the US dollar. As reported in the June 2005 FSR, by the end of 2004 the reserve holdings of major central banks<sup>7</sup> had increased by more than USD 500 billion compared with a year earlier. Although only a proxy of foreign exchange intervention activity, it is indicative that in the first six months of 2005, the same countries decreased their pace of accumulation of foreign holdings to about USD 270 billion in annualised terms. This appears to be mainly related to the Japanese authorities' policy of not intervening in foreign exchange markets,

whereas the rate of accumulation of foreign holdings in China remained robust.

Turning to forward-looking indicators, net speculative positions – the difference between non-commercial long positions and non-commercial short positions – were mostly in negative territory between May and August 2005, in line with the overall broad weakness of the dollar vis-à-vis the euro. They did however pick up in the aftermath of Hurricane Katrina, although this effect turned out to be short-lived (see Chart 1.11).

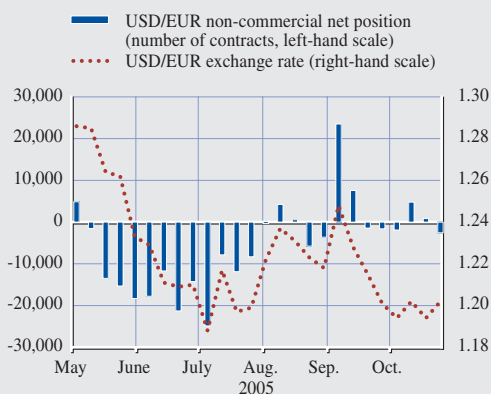
Expected short-term exchange rate volatility vis-à-vis the euro implied in options prices remained low for much of the time, and the decision of the Chinese authorities to revalue the renminbi had little discernible impact on expected exchange rate volatility (see Box 4). Short-term volatility edged up instead, though only slightly, in the aftermath of Hurricane Katrina in late August (see Chart 1.12).

Between early May 2005 and early November, the risk-neutral density (RND) function implied in options prices – which provides an

7 Japan, China, Taiwan, South Korea, Hong Kong, India, Singapore, Thailand and Malaysia.

Chart 1.11 Speculative positions and the USD/EUR exchange rate

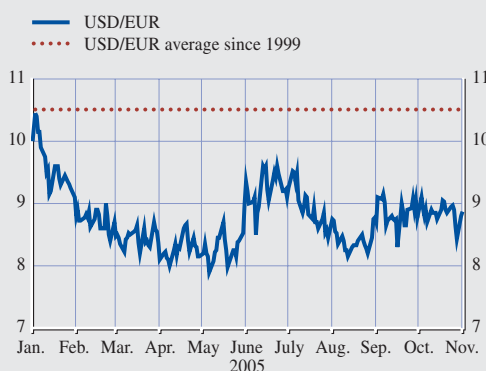
(May 2005 - Oct. 2005)



Source: Bloomberg.

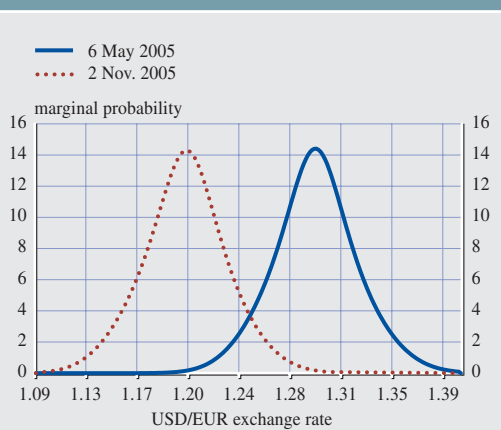
Chart 1.12 Implied volatility on USD/EUR

(Jan. 2005 - Nov. 2005, one-month implied volatility)



Source: Reuters.

**Chart 1.13 Risk-neutral probability density function of the USD/EUR exchange rate**



Sources: Citibank and ECB calculations.

estimate of the full range of market expectations of future exchange rate outcomes together with associated likelihoods – for the USD/EUR exchange rate over the next month shifted to the left as the US dollar strengthened (see Chart 1.13). At the same time, the distribution did not change significantly. This suggested that market participants continued to attach little likelihood to the possibility of unusually large, or disorderly, exchange rate movements in the short term.

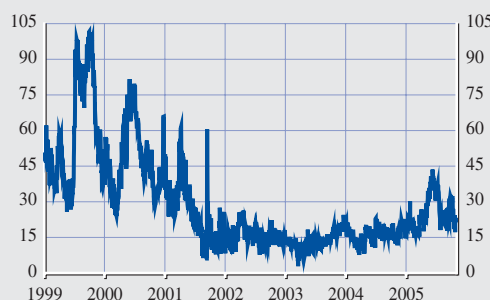
### US MONEY MARKETS

US money market conditions are important from a euro area financial stability perspective because financial institutions – including counterparties of euro area banks – usually secure their daily liquidity needs in these markets. Therefore, any disturbances in the functioning of the US money markets could give rise to liquidity problems with the potential for spillover effects to the euro area financial system.

Against a background of continued strength in the US economy, the Federal Reserve proceeded with a measured removal of earlier monetary policy accommodation. The Federal Open Market Committee (FOMC) increased interest rates by 25 basis points at each of its meetings from 30 June 2004 onwards. All in

**Chart 1.14 US six-month TED spread**

(Jan. 1999 - Nov. 2005, basis points)



Source: Bloomberg.

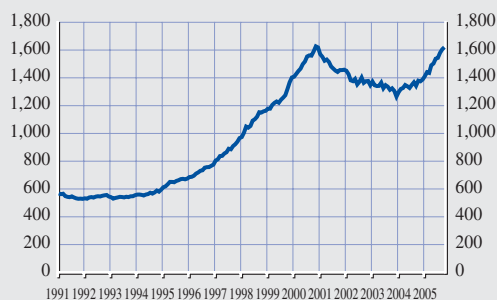
all, by early November 2005, the Federal Funds target rate had been raised 12 times, and by a total of 300 basis points, bringing it to 4.0%, a level last seen in June 2001.

By early November 2005, the pricing of Federal Funds futures contracts showed that markets were expecting the Federal Funds target rate to be raised to 4.25% by the end of 2005, and to 4.75% by summer 2006. Therefore, expectations had been significantly scaled up since the publication of the June 2005 FSR.

The so-called TED spread – the difference between uncollateralised money market interest rates and risk-free Treasury bill rates of similar maturities – can provide indications about the degree of concern among money market participants with regard to counterparty credit risks. While this spread remained broadly stable between late 2001 and early 2005, it widened significantly after March 2005 (see Chart 1.14). The main explanation for this appears to have been concerns about abnormally high exposures of some financial institutions to Ford and GM, following their downgrading by credit rating agencies. However, as these concerns subsequently proved to be unfounded, the TED spread quickly settled back to lower levels. Overall,

**Chart 1.15 US commercial paper, total amount outstanding**

(Jan. 1991 - Oct. 2005, USD billions)



Source: US Federal Reserve Board.

this suggests that market participants consider the financial position of the main counterparties in the US money markets to be robust.

Concerning the functioning of money markets, the issuance of commercial paper, which began to recover after mid-2003, continued to strengthen in the course of 2005 (see Chart 1.15).

The return of issuance activity in this market towards the peak observed in 2001 generally mirrored the improvement in the credit ratings of US corporations. By improving the access of corporations to direct short-term financing, the recovery of this market should be seen as a positive indication of US financial system stability.

### US GOVERNMENT BOND MARKETS

Long-term government bond yields in the US remained unusually low by historical standards in the six months after the June 2005 FSR. However, the low level of ten-year bond yields, which stood at 4.7% by early November 2005, remained a conundrum that was difficult to reconcile with underlying macroeconomic fundamentals. At the same time, and by corollary, concerns about the risk of an unexpected and abrupt upturn in these yields have remained.

Although their precise influence is difficult to quantify, several demand factors appear to have played a role in holding US long-term yields down. First and foremost, the demand for US Treasuries among foreign investors, especially in Japan and other Asian countries, has been significant since 2003. Furthermore, institutional demand to reduce balance sheet mismatches, which has been stimulated by recent regulatory and accounting changes, also appears to have played a role in holding long-term yields down. More recently, oil-exporting countries have sought to invest high and rising oil revenues, leading to additional demand for US bonds. By contrast, the demand for US Treasuries from US retail investors has remained rather modest, as indicated by mutual fund inflow patterns (see Chart S18).

Another potential reason why US long-term bond yields have remained as low as they have relates to high levels of global saving. Not only has saving been high in EMEs in recent years, but lower investment by the corporate sector, especially in the US, in the wake of the bursting of the equity market bubble around the turn of the century, may have played a role in pushing long-term real yields down. High levels of saving vis-à-vis investment in the US non-farm, non-financial corporate sector, as evidenced by the progressive narrowing of the financing gap after 2000 – including a relatively exceptional transition from financing deficit into surplus – were accompanied by a further drop in ex post real long-term bond yields – defined as the ten-year nominal yield minus actual consumer price index (CPI) inflation. However, the influence of this factor may start to wane as demand from corporations for external sources of funding edges up. This could precipitate an upturn in long-term real yields.

While the low level of short-term interest rates in the US had been seen as another important factor in keeping long-term yields low before mid-2004, the progressive tightening of US monetary policy since then has had little impact on the level of long-term yields. As a result, there has been a substantial flattening of the

yield curve, as measured by the spread between the ten-year government bond yield and the three-month money market rate, from about 300 basis points in the second half of 2003 towards 40 basis points in early November 2005. Nevertheless, it cannot be excluded that the protracted period of ample liquidity conditions in US money markets may have generated an overhang that has continued to influence the level of nominal long-term yields.

With the flattening of the US yield curve, the attractiveness of so-called carry trades – where funds are borrowed short-term and invested in long-term maturity instruments – has diminished. In fact, in early 2005, speculative investors began to position themselves for an upturn in long-term bond yields (see Chart 1.16).<sup>8</sup> However, as long-term yields continued to decline, positioning shifted again around the middle of the year towards betting on further declines in long-term yields.

Differences in the positioning of speculative investors at different points in the maturity spectrum can reveal information on expectations regarding future changes in the slope of the yield curve. Whereas investors had been positioning themselves for a steepening of

the yield curve throughout 2004, this positioning shifted towards flattening in the course of 2005 (see Chart 1.17). This would suggest that speculative investors do not expect a sudden upturn in long-term yields.

At the same time, however, on balance institutional investors have exhibited concerns about overvaluation in global bond markets for much of 2005 (see Chart 1.18).

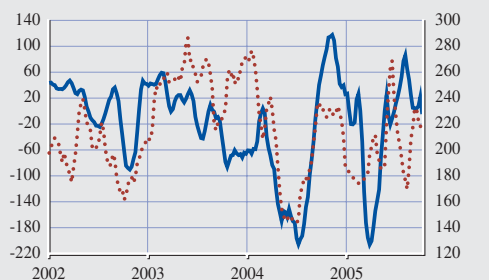
Looking ahead, an unexpected and abrupt upturn in US long-term bond yields cannot be excluded. While several factors can be identified as explanations for holding yields down, there are some uncertainties about the role they may play in the future. For instance, if short-term interest rates follow the future trajectory implicit in interest rate futures prices and if the US non-farm, non-financial corporate sector financing surplus becomes a deficit, two important supporting factors for the low level of yields will fade. Moreover, there is uncertainty about whether the strength of demand for US bonds will be sustained, especially from (Asian) official accounts.

<sup>8</sup> For an analysis of the effects of speculative positioning on US bond yields, see ECB (2004), *Financial Stability Review*, December, Box 2.

**Chart 1.16 Indicators of positioning and leverage in the US bond markets**

(Jan. 2002 - Oct. 2005, four-week moving average)

— net non-commercial positions in ten-year Treasury futures (thousands of contracts, left-hand scale)  
 ..... net secured financing of US primary dealers (USD billions, right-hand scale)

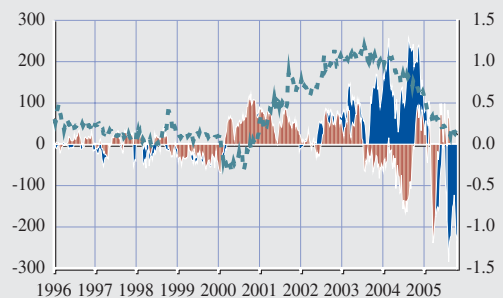


Sources: Federal Reserve Bank of New York and Bloomberg.

**Chart 1.17 Net non-commercial positions on futures and options, and the yield spread between ten and five-year government bonds**

(Jan. 1996 - Oct. 2005)

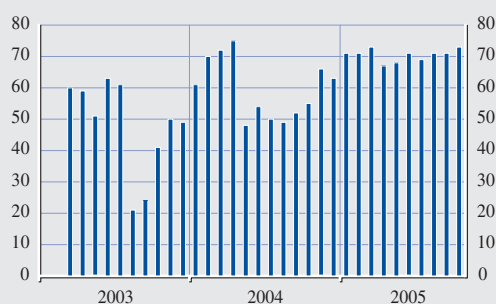
— 5-year (thousands of contracts, left-hand scale)  
 ..... 10-year (thousands of contracts, left-hand scale)  
 - - - yield spread (% points, right-hand scale)



Sources: CFTC reports and Bloomberg.

**Chart 1.18 Net percentage of equity fund managers responding that global bond markets are overvalued**

(Mar. 2003 - Oct. 2005, net %)



Source: Merrill Lynch Global Fund Manager Surveys.

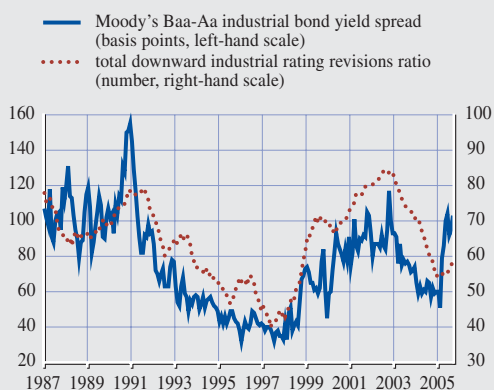
### US CORPORATE BOND MARKETS

With the downgrading of two very large issuers, GM and Ford, to sub-investment grade, the US corporate bond market was subject to a significant “credit event” in early May 2005, but proved to be resilient. Although there was some dislocation in structured credit markets, the corporate bond market remained contained, and the forced selling of corporate bonds by institutional investors did not materialise in quite the way that had been previously feared. Corporate bond spreads at the lowest end of the rating class spectrum widened only slightly, and spreads remained close to historically lows (see Chart S22). The factors contributing to generally tight corporate bond spreads continued to be the robust pace of corporate earnings growth, low default rates, balance sheet restructuring, and low stock market volatility (see Chart S16). An ongoing hunt for yield may also have played a complementary role.

With some signs that the US credit cycle may be maturing, the main risk facing corporate bond markets in the period ahead would appear to be an unanticipated turn in the cycle, possibly triggering other large credit events. In this respect, it has been notable that the number

**Chart 1.19 US industrial bond spread and the downward rating revision ratio**

(Jan. 1987 - Sep. 2005)



Source: Moody's.

Note: The downward rating revision ratio is computed as the number of downward industrial rating revisions vis-à-vis the total number of industrial rating revisions.

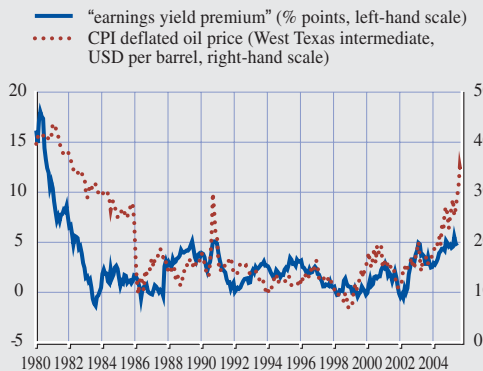
of US industrial corporate credit rating downgrades vis-à-vis upgrades has remained relatively high, despite an environment of robust economic growth (see Chart 1.19). The recent expansion of the spread between Moody's Baa and Aa industrial corporate bond yields may be a harbinger of a turn in the US credit cycle.

### US EQUITY MARKETS

US stock prices increased slightly in the six months after the June 2005 FSR (see Chart S14). This rise took place against a background of historically low stock market volatility (see Chart S16), robust earnings growth and earnings outcomes that were consistently stronger than market participants had anticipated. In addition, there was a further rise in the funding of equity investments through borrowing (see Chart S19). Rising short-term interest rates and the further upturn in oil prices may, however, have worked in the opposite direction. In particular, oil prices and a measure that captures the appetite for investing in risky equity – the spread between the S&P500 operating earnings yield and the (ex post) real ten-year government bond yield – have tended to co-move, and the recent surge in oil prices may have raised this premium (see

**Chart 1.20 US “earnings yield premium” and the real oil price**

(Jan. 1980 - Sep. 2005)



Source: Global Financial Data.  
 Note: The “earnings yield premium” is the difference between the operating earnings yield and the real long-term interest rate (nominal long-term interest rate minus actual CPI inflation).

Chart 1.20). Against this background, there was a slight reversal in the strength of equity mutual fund inflows (see Chart S18). Nevertheless, by early November 2005, the price-earnings ratio for the US stock market, based on ten-year trailing earnings, remained high (see Chart S15). At the same time, investors’ willingness to invest in risky US assets such as equity, as opposed to risk-free securities, have remained in neutral territory since May 2005 (see Chart S13).

Although the overall increase in equity prices was limited, performance remained varied across different segments of the market. While small and mid-cap stock price indices reached all-time highs, large-cap stock prices remained well below the peaks seen in early 2001.

Looking ahead, the US stock market may face some vulnerabilities. With high valuations and indications of increased borrowing in order to purchase stocks, the market could be vulnerable to adverse market dynamics. With indications that the US corporate earnings cycle may have peaked, coupled with rising short-term interest rates and higher oil prices, downside risks for US equity prices may have risen. In this respect, valuation indicators

based on options prices in October 2005 suggested that market participants were slightly more concerned about the likelihood of abnormally large stock price changes than they were in May. The skewness of the RND for US stock prices remained tilted towards the downside, and the associated probabilities of large declines increased slightly (see Chart S17).

With high price-earnings ratios and low equity market volatility, financing conditions in the US equity markets remained favourable. Nevertheless, while remaining high, the value of realised initial public offering (IPO) deals tended to level off in the course of the year to September 2005 (see Chart S21). Secondary public offerings (SPOs), after having declined slightly in the first half of the year, picked up thereafter. With indications that some firms have stepped up repurchases of their own equity through borrowing, corporate sector debt-equity ratios may yet rise. Just as lower debt-equity ratios have contributed to the lowering of equity market volatility over recent years, lower equity issuance could trigger a rise in volatility towards more normal levels.<sup>9</sup>

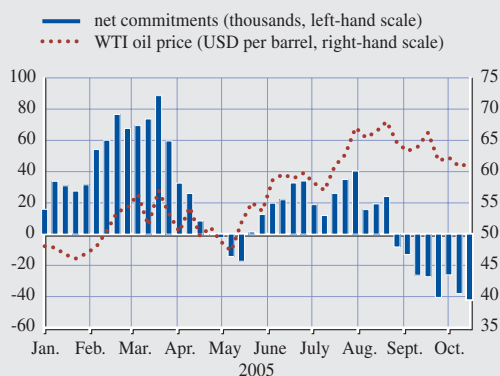
#### COMMODITY MARKETS

From a financial stability viewpoint, risks in commodity markets, especially oil markets, tend to operate largely through indirect, or macroeconomic, channels. High and volatile oil price levels can pose risks for general economic activity and inflation and could contribute to financial sector stress. Furthermore, asset prices, such as stock prices, can be adversely affected by sharp oil price increases, especially if they persist. There are indications that speculative activity in the oil derivatives markets has been increasing in recent years, so that the importance of direct channels (i.e. the exposures of financial institutions to oil price movements) may have risen commensurately.

<sup>9</sup> For an analysis of the factors driving recent declines in equity market volatility, see ECB (2004), *Financial Stability Review*, December, Box 3.

**Chart 1.21 Speculative positions and oil prices**

(Jan. 2005 - Nov. 2005, net futures commitments of non-commercials on the New York Mercantile Exchange)



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

Oil prices rose sharply after the June 2005 FSR, against a background of relatively robust demand, especially from North America, the Middle East and Asia. Meanwhile, OPEC has been producing at near-capacity, while non-OPEC supply growth remained short of expectations. Moreover, global spare refining capacity has shrunk as a result of unexpectedly strong growth in demand in recent years as well as under-investment in refining capacity. A series of refinery disruptions in the US in July and August 2005, largely due to an

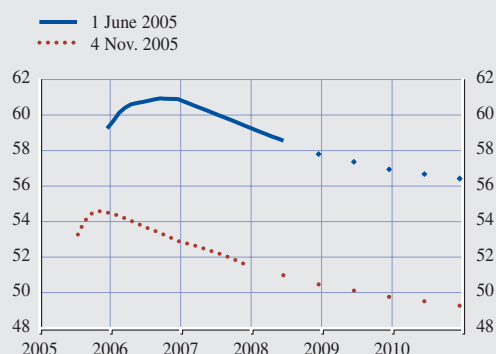
overstretched refinery system, coupled with heightened geopolitical concerns over the security of oil supplies, put further upward pressure on prices in those months. The effects of hurricanes Katrina and Rita further aggravated constraints in an already stretched oil supply chain. At the same time, speculative activity does not appear to have played a major role in driving oil prices higher (see Chart 1.21).

The surge in oil prices since June 2005 coincided with large increases in the prices of oil futures contracts with expiry dates at long horizons. The futures price for short horizons remained above spot prices – a feature seldom associated with high spot prices, reflecting concerns over the adequacy of future supplies and inventories in the near future (see Chart 1.22). Looking ahead, given the limited spare capacity all along the oil supply chain, oil prices are likely to remain sensitive to any unanticipated changes in the supply-demand balance.

The high degree of uncertainty in oil markets has been reflected in the pricing of options on oil. Implied distributions for future oil prices, which are extracted from options prices, exhibited very wide confidence intervals in early November 2005, and the balance of risks was tilted towards the upside (see Chart 1.23).

**Chart 1.22 Brent crude oil futures prices**

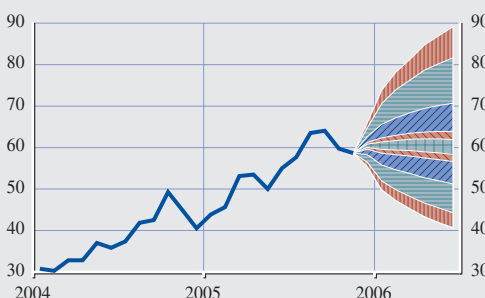
(July 2005 - Dec. 2010, USD per barrel)



Source: Bloomberg.

**Chart 1.23 Options-implied risk-neutral densities**

(Jan. 2004 - June 2006, USD per barrel, 4 November 2005, 10%, 20%, 50%, 80% and 90% confidence intervals)

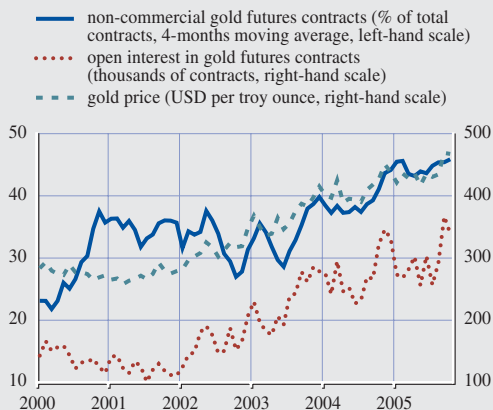


Sources: Bloomberg and ECB calculations.



**Chart 1.24 Non-commercial positions and total open interest in gold futures contracts and the gold price**

(Jan. 2000 - Oct. 2005)



Source: Bloomberg.

**Chart 1.25 Emerging market bond spreads**

(Jan. 2002 - Nov. 2005, basis points)



Source: JP Morgan Chase & Co.

Turning to other commodity prices, there have been signs of increasing speculation in the precious metals markets, which drove gold prices to their highest levels since 1988 (see Chart S25). Evidence of speculation was suggested by the rising share of non-commercial positions in total open interest in gold futures contracts (see Chart 1.24). Furthermore, net non-commercial long positions reached their highest-ever level in early October. Other factors may also have played some role in the recent increase in gold prices, such as growing physical demand for gold and, to a lesser extent, concerns about the risks of rising inflation.

#### EMERGING MARKET FINANCING CONDITIONS

Financing conditions in EMEs have remained benign in the period since the June 2005 FSR. In the interim period to early November 2005, emerging market bond spreads have even narrowed (by about 60 basis points) notwithstanding the downward level adjustments to the benchmark Emerging Markets Bond Index (EMBI) Global index associated with the completion of Argentina's sovereign debt restructuring. At about 240 basis points, emerging market bond spreads thus remained at historic lows in early

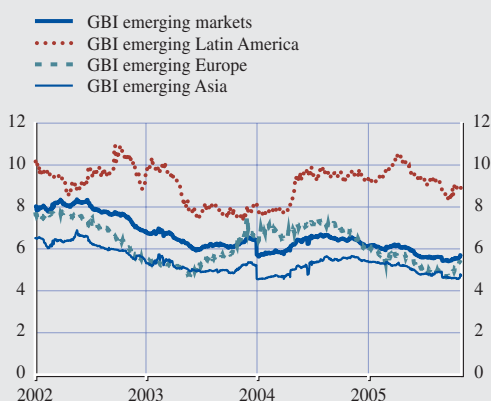
November 2005 (see Chart 1.25 and Chart S23).

Favourable financing conditions for EMEs continued to be explained by an ongoing hunt for yield by international investors, which favoured the broad EME asset class. In the year to early November 2005, returns on EME bonds had exceeded those across several other asset classes. For instance, over this period the EMBI Global index posted a 6.5% return, compared to a 1.2% return on an index of high-yield US corporate bonds. However, as the upside potential of traditional EME asset classes became more limited, there have been signs that international investors have shifted their attention elsewhere – notably to EME bonds denominated in local currency. This brought yields down in some regions (see Chart 1.26). The strength or potential for appreciation of certain emerging market currencies – which had already enabled some sovereigns to undertake international issuances in domestic currency – was also a factor in this context.

The relative attractiveness of the emerging market asset class has also been supported by the generalised improvement in EME

**Chart 1.26 Emerging market local currency bond yields**

(Jan. 2002 - Nov. 2005, %)



Source: JP Morgan Chase & Co.

fundamentals in recent years. This process has been helped by external factors, including high commodities prices and hence favourable credit dynamics for EME exporters of those products, but also by fundamental policy and structural reforms undertaken by some domestic authorities. Improvements in the overall underlying credit quality of benchmark bond indexes following rating upgrades (some to investment-grade status) were rewarded by institutional investors. Coupled with the hunt for yield, this has led to a wider investor base for the broad EME asset class.

Against this background, international bond issuance by EMEs has remained brisk. The pace of issuance has only moderated slightly in comparison to the record levels reached in 2004, as both sovereigns and corporates anticipated obligations for the remainder of the year and into 2006 (see Table S2). The momentum behind investor demand for domestic currency debt has also prompted some sovereigns to make growing use of this market segment to meet or anticipate financing needs. Nonetheless, heavily indebted EMEs, particularly in Latin America, have continued to take advantage of the benign financial environment to engage in strategic debt management in order to attain a more favourable amortisation and maturity profile.

Brazil's buyback of its outstanding capitalisation bonds (C-bonds) issued under the Brady plan – hitherto the benchmark bond among the EME asset class – stands out among these operations.

The emerging market financing outlook therefore remains favourable, although some downside risks remain. The main cause for concern is the possibility of a pronounced and sustained upturn in mature economy long-term government bond yields, and that this would be associated (as has been often the case) with tighter financing conditions. If such a negative scenario were to materialise, policymakers may take comfort in the fact that EMEs' vulnerability to external shocks has been significantly reduced in recent years. However, any rebound in long-term government bond yields would probably be associated with greater discrimination on the part of international investors owing to changes in underlying risk preference.

### 1.3 CONDITIONS OF NON-EURO AREA FINANCIAL INSTITUTIONS

#### CONDITIONS IN NON-EURO AREA EU BANKING SECTORS

The financial performance of non-euro area EU Member States' banking sectors was strong in 2004. An improvement in profitability was mainly driven by enhanced cost efficiency, strong growth in lending, mostly for housing purposes, as well as reductions in provisioning flows relative to total assets. Asset quality improved given a benign credit environment in most non-euro area EU banking sectors. While solvency indicators did deteriorate to a certain extent,<sup>10</sup> they still remained at relatively comfortable levels.

The profitability of the EU-13<sup>11</sup> banking sectors improved across the board in 2004. The average return on equity (ROE) for EU-13 banks stood at

<sup>10</sup> Owing to rapid credit growth, risk weighted assets increased at a higher pace than regulatory capital.

<sup>11</sup> The EU-13 grouping comprises all EU Member States that are not in the euro area.

16.4% at end-2004, up from 15.2% in 2003. The degree of improvement in profitability varied across EU-13 countries, with banking sectors in high-growth catching-up economies generally showing the largest gains.

Operating income (as a percentage of total assets) fell slightly on aggregate in 2004 for the EU-13 banking sectors, owing to declining net interest margins. The pressure on net interest margins in several countries stemmed from low interest rates and strengthened competition, especially in the market for housing loans. This notwithstanding, net interest income continued to rise, as the impact of narrowing margins was outweighed by brisk growth in lending volumes. Concerning lending to the private sector, a common pattern across non-euro area EU Member States was strong growth in lending to households, in particular for housing purposes. Lending to non-financial corporations was characterised by higher growth in lending volumes in the EU-13 countries than in the euro area, although this was outpaced by the growth in household lending.

Contrary to developments in net interest income, non-interest income increased at a faster rate than total assets in 2004 for EU-13 banks. Consequently, as a share of total operating income, non-interest income also rose. This notwithstanding, the relative importance of non-interest income in generating income remained significantly lower for EU-13 banks than for their counterparts in the euro area. In 2004, the share of net non-interest income in total income reached an average of 32.4% in the EU-13 banking sectors compared to 47.8% in the euro area.

An important factor underlying the improved profitability in 2004 across the non-euro area EU banking sectors was cost containment. In 2004, banks in these countries further reduced their cost-to-income ratios, and generally registered lower ratios than the average for euro area banks. Looking at different sub-

groups, countries with rapid growth in credit and operating income recorded the most marked improvements in cost-to-income ratios.

In 2004, general economic conditions in the non-euro area EU Member States were supportive of banks' activities. On account of the benign credit environment, both the flow and the stock of provisions fell, as a percentage of total assets, between 2003 and 2004. The low level of provisioning may have been a reflection of improved asset quality in most countries. The improvement in loan quality, however, was not uniform across all the EU-13 banking sectors. In those countries where credit growth was strong, the share of non-performing and doubtful assets in total loans edged up slightly. The coverage ratio, i.e. the ratio of provisioning stocks over total non-performing and doubtful assets, increased in 2004 for EU-13 banks as a whole. At first sight, this might seem to alleviate potential concerns caused by lower provisioning flows. This positive assessment should be qualified, however, as the coverage ratio in several EU-13 countries remains below the average of euro area banks.

Notwithstanding improved profitability, banks' capital adequacy ratios tended to decrease in the EU-13 countries, with both the overall solvency ratio and the Tier 1 ratio declining. In general, however, solvency ratios remained comfortable and still compare favourably with those of euro area banks.

Looking ahead, available data for the first half of 2005 indicate that the positive trends experienced in 2004 are likely to continue further. In an environment of favourable cyclical conditions and low interest rates, growth in lending to the private sector remained robust in the first half of 2005, suggesting that banks' profitability might not be threatened by a slowdown in credit growth. Looking at the downside risks to banks' profitability outlook, concerns related to the sustainability of improved profitability might

arise in some EU-13 banking sectors where recent improvements in banks' financial conditions have mainly resulted from declining provisions and enhanced cost control. In those non-euro area EU Member States where rapid growth in credit to the private sector has been accompanied by a marked increase in borrowers' exposure to foreign exchange rate risk, unexpectedly large adverse exchange rate movements might be a source of rising loan losses for banks.

### GLOBAL BANKS

The condition of global financial institutions matters for euro area financial stability because of the important role they play in financial markets and their function as counterparties to other financial institutions. Potential problems in global financial institutions could lead to disruptions in euro area financial markets and could pose counterparty risks for some euro area financial institutions.

Most global financial institutions enjoyed good financial results for 2004, albeit slightly weaker than the year before. Performance for the first two quarters of 2005, although still healthy, deteriorated somewhat for several of these institutions. The simple average ROE was 13.6% for the second quarter of 2005, compared with about 17% for 2004 as a whole.<sup>12</sup> Adequate levels of profitability were maintained and costs remained under control. In addition, legal risks have been significantly reduced as some institutions have settled outstanding Enron-related litigation, removing a source of uncertainty for future earnings. Furthermore, M&A and investment banking operations, which have tended to prove lucrative in the past by generating significant fee income, continued to contribute positively. In some cases, this was accompanied by increased staff compensation costs, but by and large these costs remained relatively well-contained.

However, conditions in global capital markets had an adverse impact on financial results from trading, which has been a major contributor to

Chart 1.27 Trading revenues as a proportion of total net revenues



Sources: SEC filings and ECB calculations.  
Note: The institutions included are Goldman Sachs, Lehman Brothers, JP Morgan Chase & Co., Morgan Stanley, Merrill Lynch, Citigroup, UBS and CSFB.

profitability over the last two years. For most institutions, trading revenues decreased in the first quarter of 2005 both in absolute amounts and as a share of total revenues compared with 2004, although they showed a slight improvement in the second quarter (see Chart 1.27).

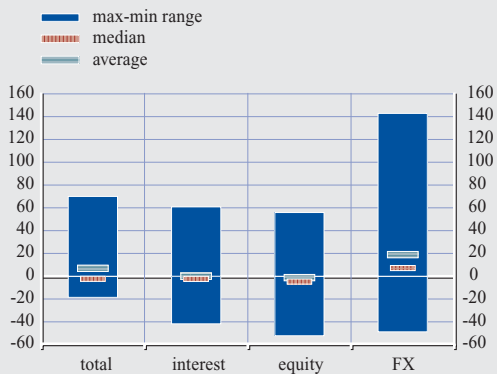
There are three main reasons for this. Firstly, the flattening of market yield curves, especially in the US, made carry trades less profitable for most institutions. Secondly, for some institutions, the widening of spreads provoked by the Ford/GM downgrade resulted in some trading losses. Thirdly, the subsequent decline in volatility in US bonds, combined with subdued conditions in equity markets, lessened the opportunities for these institutions to risk their own capital and provide market-making services to clients.

Value at Risk (VaR) exposures increased marginally, with commodities recording the largest increase as institutions had taken various positions in cash and derivatives markets by June 2005 compared with June 2004 (see Chart 1.28). However, owing to a lack of

<sup>12</sup> See Fitch Ratings (2005), "2Q05 Peer Data for Securities Firms", Special Report. Data exclude UBS and include Charles Schwab and Lazard.

**Chart 1.28 Changes in Value at Risk (VaR) Levels**

(changes in levels between Q2 2004 and Q2 2005)



Sources: SEC filings and ECB calculations.  
 Note: The institutions included are Goldman Sachs, Lehman Brothers, JP Morgan Chase & Co., Morgan Stanley, Merrill Lynch, Citigroup, UBS, and CSFB.

data, it is difficult to determine whether or not these firms have been speculating on oil price developments.

Foreign exchange or currency-related risk exposures rose somewhat. Average equity-related risk exposures decreased slightly, while the average change in interest rate risk exposures remained essentially zero. However, since these changes are calculated as an average change compared with 2004, this may understate the fact that some institutions reduced their interest rate spread exposure at certain points during the first half of 2005 owing to the widening of spreads in corporate debt markets. Notwithstanding, in overall terms of actual exposure, the largest market risk remains interest rate-related. The apparent increase in risk-taking appetite by these institutions also led to a slight increase in the number of trading days with recorded losses in the first half of 2005 compared with the same period in 2004. However, in cases where negative trading days occurred, the realised loss was not greater than the amount predicted by the VaR models, indicating that risks have been managed relatively well.<sup>13</sup>

Looking ahead, global banks can expect continued profits, although at a more moderate

pace. This is primarily due to the decline in trading revenues experienced by several of these institutions. One institution was placed on negative ratings watch in April 2005 for reasons related to changes in management and the possible sale of one of its business units; however, the overall assessment of rating agencies for this group as a whole is positive.

While the risk appetite of some of these institutions may have increased in the course of 2005, indications are that risks have been well-managed. All in all, the financial condition of these institutions and their outlook give little cause for concern from a financial system stability viewpoint.

#### JAPANESE BANKS

While the direct links between euro area and Japanese financial institutions appear to be limited, individual euro area banks may have exposures to the Japanese banking sector through direct claims or through financial markets.

As discussed in the June 2005 FSR, the balance sheet positions of Japanese banks have significantly improved in recent years. This improvement has, to some extent, reflected the implementation of a broad spectrum of policies aimed at guaranteeing the stability of the country's banking sector. These include increased regulatory and supervisory pressure and public capital injections. More recently, the banking sector has also benefited from the gradual recovery in the macroeconomic environment and from improved credit risk conditions.

The decline in non-performing loan ratios (i.e. the ratio of non-performing loans to total outstanding loans) and the rise in capital adequacy ratios observed in recent years are among the most visible signs of improvement. The non-performing loan ratio of all banks stood at 4% at the end of March 2005, compared

<sup>13</sup> This is based on information made in public SEC filings by these institutions. Not all institutions disclose the number of negative trading days or VaR exceptions.

with 5.3% at the end of September 2004 (see Chart S7). This reduction has contributed somewhat to the improvement in profitability.

This improvement in profitability has also contributed, to a limited extent, to increasing solvency ratios, which have improved for both major and smaller regional banks. The average core Tier 1 capital adequacy ratio of the major banks improved from 6.0% at the end of March 2004 to 6.2% at the end of March 2005. Meanwhile, the smaller regional banks increased their average Tier 1 ratio from 7.5% in March 2004 to 7.9% in March 2005.<sup>14</sup> It should be noted that some of the increase in solvency ratios is due to injections of public funds to re-capitalise the banking system. Furthermore, some Japanese banks continue to use (net) deferred tax assets (DTA) to maintain their regulatory capital above minimum thresholds. These are discretionary accounting items included in balance sheets in order to bridge the gap between accounting and taxable income. A continuation of the improvements noted over the past few years should lead to both an increase in overall solvency levels and in the quality of capital.

From a financial stability perspective, two main concerns remain. Firstly, the recent increases in the profitability of Japanese banks can be attributed to a reduction in credit costs and a rise in non-interest income, rather than to an improvement in interest income.<sup>15</sup> The profitability of the Japanese banking sector continues however to remain low by international standards.

Secondly, the large holdings of Japanese government bonds by domestic banks may give rise to potential losses arising from market risk in the event of an increase in long-term interest rates. However, there is some evidence that Japanese banks, especially the major banks, have in recent years reduced the duration of these portfolios, which should limit potential losses.<sup>16</sup>

<sup>14</sup> See Fitch Ratings (2005), "Japan Major Banks 2005 – Happy Days Are Here Again?", Special Report, July; and Fitch Ratings (2005), "Japanese Large Regional Banks: Results for 2004/2005", Special Report, July. The Tier 1 figures for major Japanese banks exclude Resona.

<sup>15</sup> For a comprehensive analysis, see A. Wolfson (2005), "Why Is Japanese Banking Sector Profitability So Low?", *IMF Article IV Consultation Discussions with Japan – Selected Issues*, pp. 54-64.

<sup>16</sup> See Bank of Japan (2005), *Financial System Report: An Assessment of Financial System Stability, Focusing on the Banking Sector*, August.

## 2 THE EURO AREA ENVIRONMENT

*Notwithstanding a background of rising uncertainty concerning the euro area economic outlook, the balance sheet positions of large corporations and households appear to be reasonably solid. However, potential vulnerabilities remain that may pose risks for euro area financial stability if they were to intensify. Despite improved profitability, corporate sector indebtedness remains high. A sudden and sharp reversal in economic growth – although very unlikely – could, along with persistently high oil prices, erode profitability. The sustained dynamic – and sometimes divergent – developments in residential property prices in individual Member States also continue to call for careful monitoring.*

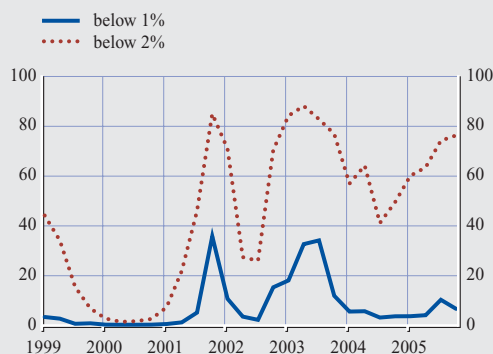
### 2.1 ECONOMIC OUTLOOK AND RISKS

The macroeconomic environment in which financial institutions operate is an important determinant of the creditworthiness of households and firms, and of banking sector profitability in general. This means that general macroeconomic conditions can be an important exogenous source of risk for financial stability.<sup>1</sup> In the six months since the June 2005 FSR, there have been some indications that the pace of economic growth has lost some momentum since mid-2004. Both ECB staff projections and the expectations of international and private sector organisations regarding economic activity in the euro area have been revised downwards over the past six months. Nevertheless, the slowdown in growth seems to be temporary, and longer-term expectations point towards the pace of economic activity rising towards potential growth rates.

The risks that surrounded the outlook for euro area growth at the time of the June 2005 FSR appear to have become more pronounced over the past six months. On the external side, the sustained rise in oil prices poses risks for corporate profit margins, thereby raising

**Chart 2.1 Survey-based estimates of the downside risk of weak real GDP growth in the euro area**

(Q1 1999 - Q4 2005, %)



Source: ECB.

Note: Measured as the percentage of the probability distribution for real GDP growth below the threshold of euro area growth of 1% and 2% in the SPF, one year ahead.

corporate sector credit risk, and for consumer spending. Moreover, widening global imbalances have continued to pose a risk of sharp exchange rate movements. On the domestic side, the main risk to a strengthening of growth in the euro area stems from low consumer confidence and consequently low domestic demand, which can be attributable to both higher oil prices and only gradually improving labour market conditions.

The possibility of increased risk to the economic outlook appears to be shared by private sector forecasters, as revealed for instance in the Survey of Professional Forecasters (SPF). The percentage of the probability distribution of one-year-ahead forecasts for euro area real GDP growth below 2% in the SPF has risen since the June 2005 FSR (see Chart 2.1). Moreover, there has been a slight rise in the percentage of the probability distribution of growth below 1%.

<sup>1</sup> See ECB (2005), "Indicators of Financial Distress in Mature Economies", *Financial Stability Review*, June, pp. 126-131.

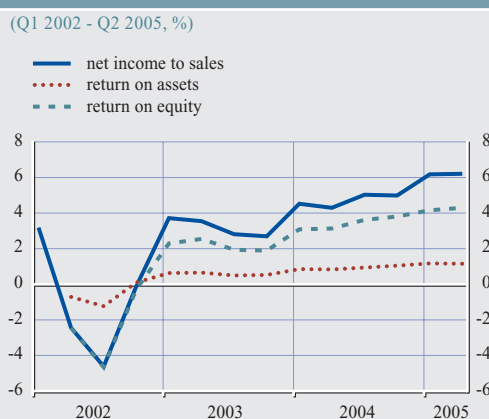
## 2.2 BALANCE SHEET CONDITIONS OF NON-FINANCIAL CORPORATIONS

From a financial stability viewpoint, the condition of non-financial corporate sector balance sheets is crucial for an evaluation of the credit risks posed by firms for banks and investors in corporate bond markets. Furthermore, the condition of non-financial corporate sector balance sheets is fundamental to the performance of stock markets and capital markets.

The outlook for the euro area non-financial corporate sector has remained benign over the past six months. The balance sheets of firms have been further strengthened by robust profit growth and further debt restructuring efforts. In addition, in a very low interest rate environment, the debt financing burden of non-financial corporations has remained contained. Reflecting these developments, credit spreads have remained tight and banks' credit standards on the approval of loans to enterprises have continued to ease.

By late 2005, the main risks facing the non-financial corporate sector continued to be uncertainties surrounding the broad economic outlook – including the potential adverse effects of higher oil prices on corporate sector profitability. In addition, relatively high levels of indebtedness and continued reliance on borrowing at floating and short-term interest rate fixation has raised the interest rate risk on corporate sector balance sheets.

Chart 2.2 Profit ratios of euro area listed non-financial corporations



Sources: Thomson Financial (Worldscope) and ECB calculations.

Note: The calculation is based on an unbalanced sample of quarterly data over time covering around 600 firms for ROE and return on assets (ROA), and around 1,100 firms for net income to sales. Figures for Q2 2005 are based on a limited data set.

After mid-2002, the profitability of large non-financial euro area firms had strengthened considerably. In the first half of 2005, the aggregate ROE of listed firms reached four-year highs (see Chart 2.2), indicating that profitability remained strong. The ongoing improvement in corporate sector profitability was partly due to strong sales growth. However, towards the end of 2004 and into early 2005, costs increased, most likely owing to rising oil and commodity prices. Although the recent overall financial performance of the non-financial corporate sector has improved considerably, performance has varied across sectors, with profitability improving most significantly in the more export-oriented sectors (see also Box 5).

### Box 5

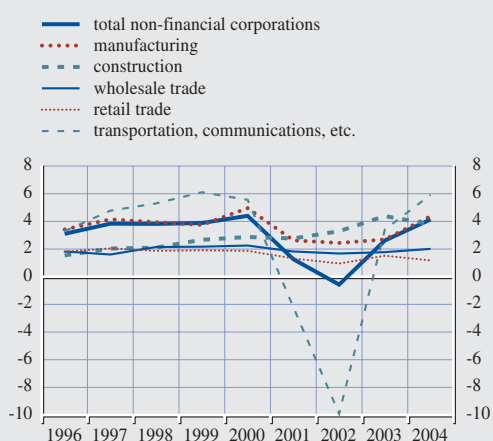
#### SECTORAL PROFIT AND LEVERAGE DEVELOPMENTS OF EURO AREA LISTED NON-FINANCIAL CORPORATIONS: EVIDENCE BASED ON MICRO DATA

Following the slump in aggregate euro area corporate sector profitability in 2001 and 2002, there was a significant turnaround (see also Chart 2.2). At the same time, the accumulation of debt slowed down as companies sought to restructure their balance sheets. Since aggregate figures may hide differences at the sectoral level, and because banks may have different exposures to different corporate sectors, it is of interest to analyse measures of corporate



**Chart B5.1 Net income-to-sales ratio across non-financial corporate sectors**

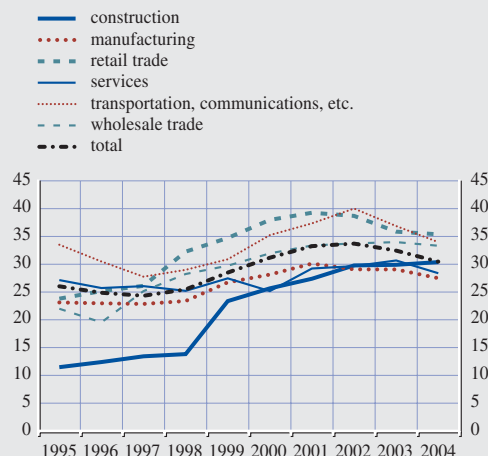
(%, annual data)



Sources: Thomson Financial Datastream and ECB calculations.

**Chart B5.2 Debt-to-total assets ratio across non-financial corporate sectors**

(%, annual data)



Sources: Thomson Financial Datastream and ECB calculations.

financial performance at a sectoral level. This Box examines recent developments in profit and leverage indicators for the non-financial corporate sectors in the euro area based on firm-level data.<sup>1</sup>

Beginning in 2003 and continuing into 2004, there was a substantial recovery of net income-to-sales ratios across almost all corporate sectors (see Chart B5.1).<sup>2</sup> Profitability based on this measure performed strongest in more export-oriented sectors, especially the manufacturing sector, in an environment of strong global demand. In addition, the profitability of the transportation and communications sectors also picked up significantly, the latter possibly reflecting the efforts made in the telecommunications industry to cut back on operating costs. By contrast, the improvement in profitability of more domestically oriented sectors, such as retail trade (and in part wholesale trade), was more muted. Although this probably reflected to some extent the sluggishness of domestic demand during this period, profitability in these sectors has also tended to be less cyclical.

Turning to financial leverage, a pattern common to all sectors was a significant build-up of debt in the late 1990s and 2000, indicated by rising debt-to-total assets ratios (see Chart B5.2). The accumulation of debt was particularly strong in the transportation and communications sectors, and above average in the retail and wholesale trade sectors.<sup>3</sup> Debt ratios for the manufacturing and construction sectors, on the other hand, stood at more moderate levels. Later on, there was an overall stabilisation of debt-to-total assets ratios, as firms started restructuring and

1 For a more detailed analysis of micro data from a corporate finance perspective, see ECB (2005), "Developments in Corporate Finance in the Euro Area", *Monthly Bulletin*, November, pp. 75-90.

2 Net income is a narrow corporate profit indicator and is defined as the operating and financial profit after interest expenses, taxation and extraordinary items.

3 The transportation, communications, electric, gas and sanitary services sector includes air transport; railroads; transportation services; water transportation; motor freight services; and electric, gas and sanitary services.

deleveraging their balance sheets, and in 2004 there was even a broad-based reduction. The deleveraging efforts were particularly notable in the communications sector. In addition, manufacturing firms, supported by the strength of cash flows, also appeared to take the opportunity to reduce their debts. In the retail sector, the debt-to-asset ratio stabilised at a high level in 2004, probably reflecting the relatively weak earnings performance of this sector. Likewise, the debt ratio of the wholesale sector (both with respect to the durable and non-durable goods sub-sectors) remained at a relatively high level at the end of 2004.

All in all, patterns in sectoral profit and leverage indicators show that the profitability and indebtedness of export-oriented manufacturing companies has improved substantially in recent years. In addition, the balance sheet conditions of the communications sector also improved strongly in 2003 and 2004, owing to rising profits and significant debt-reducing efforts. By contrast, profit developments in the retail trade sector, and to some extent also in the wholesale trade sector, were more muted, partly reflecting weak private consumption growth in the euro area. As a result, the debt ratios of these sectors remained high. This means that the balance sheet conditions of some companies, particularly in the retail sector, could prove to be vulnerable to continued weakness in domestic demand, and any unexpected deterioration could impair the ability of these companies to honour their debt obligations. To the extent that euro area banks tend to have large exposures to the retail sector, including to many SMEs and to other consumer-oriented companies, such a scenario might pose risks for the soundness of the banking sector.<sup>4</sup>

4 For a further analysis of the sectoral credit risk exposures of euro area banks, see Box 7.

Throughout the first three quarters of 2005, the growth of corporate sector earnings more or less consistently exceeded the expectations of market analysts. Looking ahead, although market analysts are expecting some slowdown

in the pace of corporate earnings growth over the next 12 months, future profitability growth of larger listed corporates is still expected to remain strong (see Chart 2.3).

**Chart 2.3 Actual and expected corporate earnings in the euro area**

(Jan. 2000 - Sep. 2005, %)



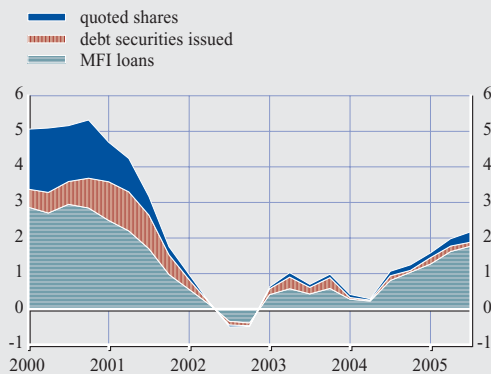
Source: Thomson Financial Datastream.

The efforts that corporations have made in recent years to clean up their balance sheets has, combined with increases in companies' financial asset holdings, caused the debt-to-financial assets ratio of the sector to decline from 2003 onwards. From a peak of over 80% in early 2003, this ratio had declined to slightly over 70% by Q1 2005 (see Chart S29). Hence the ability of firms to repay debt by liquidating financial assets, if needed, improved.

Although the recent further strengthening of corporate sector profitability improved the availability of internal funds to finance firms' operations, external funding picked up significantly in the first eight months of 2005, reaching the highest level seen since mid-2001 (see Chart 2.4).

**Chart 2.4 Breakdown of the real annual rate of growth of external financing to non-financial corporations in the euro area**

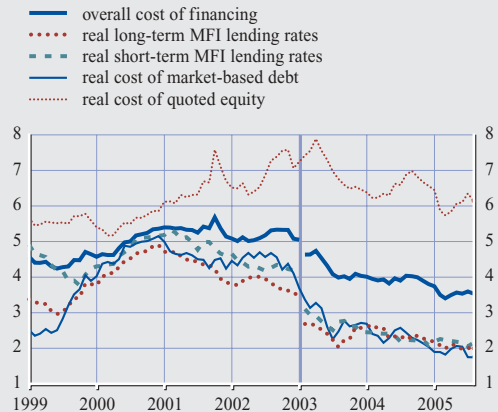
(Q1 2000 - Q3 2005, %)



Source: ECB.  
Note: The annual rate of growth is defined as the difference between the actual annual growth rate and the GDP deflator.

**Chart 2.5 Cost of external financing of non-financial corporations**

(Jan. 1999 - Aug. 2005, basis points)



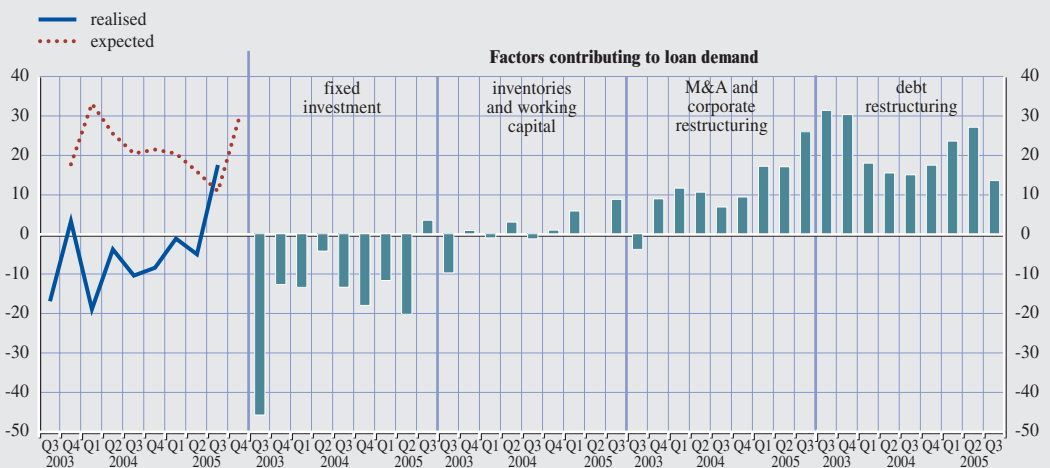
Sources: ECB, Thomson Financial Datastream, Merrill Lynch, Consensus Economics Forecast and ECB calculations.  
Note: The real cost of external financing is calculated as a weighted average of the cost of bank lending, the cost of debt securities and the cost of equity, based on their respective amounts outstanding and deflated by inflation expectations. The introduction of MFI interest rate statistics at the beginning of 2003 led to a statistical break in the series.

This pick-up may have been induced by the persistently low costs of debt financing (see Chart 2.5). In particular, firms may have “frontloaded” their borrowing, taking advantage of cheap terms to meet their future financing needs and/or to restructure the

maturity profile of existing debt at less expensive terms. There have also been some indications that a further factor underlying this rise in borrowing by firms was an increased need for funds to finance M&As in 2005 (see Chart 2.6, 4th panel from left). In the first three

**Chart 2.6 Demand for loans and credit lines to enterprises, and contributing factors**

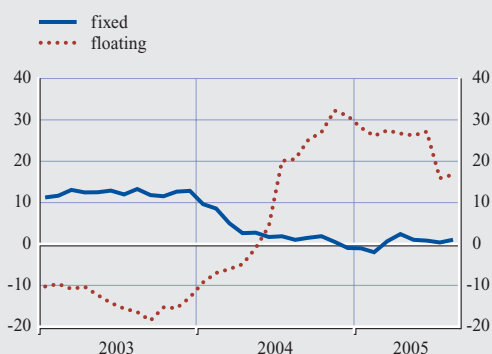
(Q3 2003 - Q4 2005, net %)



Source: ECB Bank Lending Survey.

**Chart 2.7 Debt securities issued by euro area non-financial corporations – fixed versus floating rate**

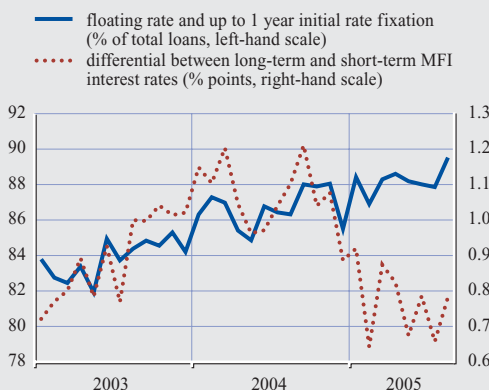
(Jan. 2003 - Aug. 2005, % per annum)



Source: ECB.

**Chart 2.8 New business loans to euro area non-financial corporations with short-term interest rates and term spreads**

(Jan. 2003 - Aug. 2005)



Source: ECB.

quarters of 2005 this amounted to €168 billion, compared with €108 billion in the same period in the year before (i.e. an increase of around 56%). Apart from debt restructuring, the strengthening of demand for short-term funding may have been driven, to some extent, by an increasing need for working capital (see Charts S30 and S31).

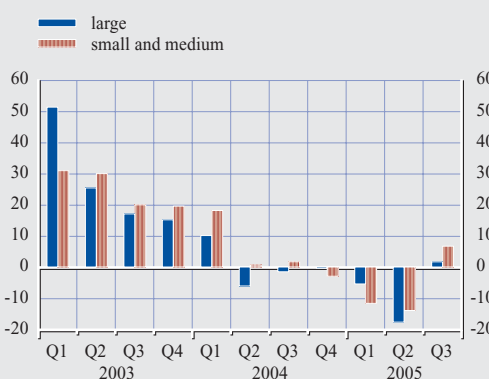
Faster growth in borrowing by firms caused the debt-to-GDP ratio of the sector to rise in the second and third quarters of 2005 (see Chart S28). While ongoing debt restructuring – mainly through an effective shortening of the maturity of debt – reduced the financing burden (interest payments) of the corporate sector, it did not lower the amount of debt outstanding. The persistently high level of debt leaves many companies vulnerable to a deterioration in balance sheets and/or an increase in interest rates.

Even though market yield curves and the term structure of retail bank lending rates to firms flattened throughout the first eight months of 2005, which might ordinarily have been expected to reduce incentives to borrow in the short term, the increasing tendency of companies to take on debt at floating and/or short-term rate fixation (as reported in Box 4 of the June 2005 FSR) continued over this period (see Charts 2.7 and 2.8).

Banks seem to have been willing to take on more credit risk up until the third quarter of 2005 in order to boost profitability (see Box 11). Prior to the third quarter, this was reflected in a continued net easing of credit standards on loans to enterprises (see Chart B11.1); and on riskier loans to SMEs (see Chart 2.9). During the third quarter of 2005 a slight net tightening occurred, although it is too early to say whether this represents a turning point in

**Chart 2.9 Credit standards applied to the approval of loans to non-financial corporations – small and medium-sized versus large enterprises**

(Q1 2003 - Q3 2005, net percentage changes)



Source: ECB Bank Lending Survey.

credit standards. This occurred against a background of compressed interest margins and strong competition, as well as perceptions of a deterioration in the economic outlook.

The perception that banks may have become more sensitive to taking on additional credit risk is reflected, to some extent, in the spread of monetary financial institution (MFI) interest rates on loans to SMEs over comparable market rates. By August 2005, this spread had increased by some 40 basis points compared to its lowest point in mid-2004 (see Chart S67).

#### MARKET INDICATORS OF CORPORATE SECTOR FRAGILITY

Market-based indicators have continued to point towards improved credit risk assessments for the non-financial corporate sector over the past six months. The distribution of expected default frequencies (EDF) – a market-based indicator of the probability of default over a 12-month horizon – for the non-financial corporate sector became significantly more compressed at lower levels in September 2005 (see Chart S32).

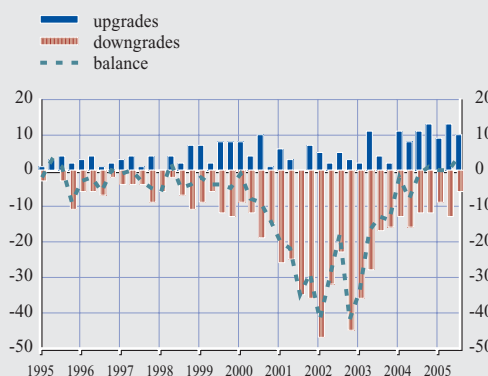
The better assessment of non-financial corporate sector credit risks can largely be attributed to a notable improvement in the assessment of default expectations for large euro area firms. While the EDFs for smaller corporations have also improved in the last six months, this was far less pronounced (see Chart S33). Nevertheless, to the extent that these forward-looking indicators can provide an indication of the future performance of loans to the non-financial corporate sector, the corporate credit risk outlook for banks appears to be improving.

#### CORPORATE SECTOR RISKS

The strengthening of corporate sector financial positions over recent years has been acknowledged in rising equity prices, a tightening of credit spreads (see Section 3 on the euro area financial markets) and declining EDFs. Moreover, the ratio of credit rating upgrades to downgrades became balanced in late 2004 for the first time since Q3 1998 (see

**Chart 2.10 European non-financial corporate sector downgrades, upgrades and balance**

(Q1 1995 - Q3 2005, numbers)



Source: Moody's.

Chart 2.10), reflecting perceptions of improving creditworthiness.

Looking ahead, the main risks facing the euro area non-financial corporate sector continue to be the risk of a prolonged period of high oil prices as well as downside risks to economic growth. To some extent, the rise in oil prices appears to be reflected in market analysts' expectations regarding corporate sector profit growth, which seems set to decelerate somewhat. As recent patterns of profitability across industrial sectors have shown, the firms at greatest risk should economic activity prove weaker than expected are likely to be in sectors that are more domestically oriented, such as SMEs (see Box 6).

A further source of risk for the non-financial corporate sector relates to the relatively high levels of indebtedness. The tendency of firms in recent years to shorten the effective maturity of their borrowing could imply a significant deterioration in corporate balance sheet conditions should short-term interest rates rise.

Box 6

CORPORATE EARNINGS AND SECTORAL EXPOSURE AT RISK IN THE EURO AREA

An important determinant of corporate sector creditworthiness is the (expected) profitability of firms. When firms' profitability begins to improve, the availability of internal sources of finance also rises, and often this is associated with, and even anticipated by, narrowing corporate bond spreads (see Chart B6.1). In early 2005 there were some signs of a deceleration in the rate of profit growth of stock exchange-listed firms. Since aggregate figures may hide differences at the sectoral level, and because banks may have different exposures to different corporate sectors, this Box examines corporate earnings at a sector level, making links to the sectoral exposure at risk of euro area banks.

Although operating earnings growth in the euro area in the first three quarters of 2005 was very strong, there were substantial differences in performance across sectors (see Table B6.1). The early product chain sectors, such as resources (RES), basic (BI) and general industries (GI), demonstrated comparatively strong earnings growth, despite high and rising oil prices. The earnings growth of the financial sector (FIN) was also strong, albeit consistently lower than that of the non-technology, media and telecommunications (TMT) sector in 2004 and 2005. Most striking is that the annual growth rate of reported earnings in the

Chart B6.1 Corporate earnings growth and bond spreads in the euro area



Sources: Thomson Financial Datastream and Merrill Lynch.

Table B6.1 Reported earnings growth of stock market-listed companies broken down by sector

(% per annum, average of monthly data)

	RES	BI	GI	CC	NCC	CS	NCS	UTI	IT	FIN	TMT	Non-TMT
Q1 2004	13.3	-15.8	-14.0	-5.9	0.9	-11.8	49.4	5.3	-9.8	-6.9	26.7	-5.2
Q2 2004	11.5	-3.6	24.1	-6.0	0.4	-9.0	22.9	13.0	0.3	0.8	14.1	2.8
Q3 2004	16.1	2.1	19.9	8.9	14.4	1.0	23.4	11.5	13.9	4.2	18.2	7.7
Q4 2004	25.5	16.9	49.6	8.1	23.6	27.3	10.9	16.9	3.9	2.8	16.6	13.0
Q1 2005	29.5	35.3	48.6	8.7	21.4	32.4	7.0	27.8	6.5	11.7	12.0	20.8
Q2 2005	40.0	48.9	30.5	15.9	30.1	44.3	14.6	33.2	8.5	15.2	18.8	25.3
Q3 2005	31.4	39.4	33.1	5.5	13.9	41.2	-2.4	23.2	5.0	14.4	8.7	19.9

Source: Thomson Financial Datastream.

Note: 2005 Q3 up to August. RES = Resources, i.e. mining, oil & gas; BI = Basic industries, i.e. chemicals, construction & building materials, forestry & paper, steel & other metals; GI = General industrials, i.e. aerospace & defence, diversified industrials, electronic & electric equipment engineering & machinery; CC = Cyclical consumer goods, i.e. automobiles, household goods & textiles; NCC = Non-cyclical consumer goods, i.e. beverages, food producers & processors, health, packaging & printing, personal care & household products, pharmaceuticals, tobacco; CS = Cyclical services, i.e. distributors, general retailers, leisure, entertainment & hotels, media & photography, restaurants, pubs & breweries, support services, transport; NCS = Non-cyclical services, i.e. food & drug retailers, telecommunication services; UTI = Utilities, i.e. electricity and gas distribution; IT = Information technology, i.e. information and technology hardware, software & computer services; FIN = Financials, i.e. banks, insurance, life assurance, investment companies, real estate, speciality & other finance; TMT = Technology, media and telecommunications; Non-TMT = Other than TMT.

cyclical consumer goods (CC), non-cyclical services (NCS) and IT sectors slowed down significantly in the course of 2005.

Given that earnings growth matters for the creditworthiness of firms, it is of interest to consider the patterns of exposure at risk of euro area banks to the different sectors (see Table B6.2) The largest exposure at risk of euro area banks at a sectoral level in early 2005 was the consumer cyclical sector, a sector which at the same time was showing rather low earnings growth figures. Even the next two sectors to which euro area banks had large exposures in early 2005 – i.e. the financial and TMT sectors – endured a slowdown in earnings growth through 2005. Between early 2004 and early 2005, euro area banks increased their exposure at risk to the financial sector, whereas they reduced their exposure to the early-product chain sectors, which subsequently recorded very strong earnings growth figures in the course of 2005.

**Table B6.2 Euro area bank exposure at risk broken down by sector**

(March 2005)

		BIC	EUTI	CAP	CC	NCC	FIN	TMT
Total exposure	EUR billions	609	224	224	1,682	805	6,360	218
Sectoral EDF	% probability	0.25	0.08	0.50	0.46	0.23	0.07	1.13
Exposure at risk	EUR billions	1.52	0.18	1.12	7.74	1.85	4.45	2.47
	in % all sectors	7.9	0.9	5.8	40.0	9.6	23.0	12.8
% change March 2005 – June 2004		-66.9	-87.6	-50.3	-14.5	32.1	46.3	-14.5

Sources: Banking Supervision Committee and ECB calculations.

Note: The euro area refers to the sum of nine euro area countries with only large exposure data for Finland and no data for Greece, the Netherlands and Luxembourg. BIC = Basic industry and construction; EUTI = Energy and utilities; CAP = Capital goods; CC = Consumer cyclical goods; NCC = Non-cyclical consumer goods; FIN = Financials; TMT = Technology, media, and telecommunications.

All in all, data on sectoral earnings growth, together with bank exposure at risk data for the euro area, show that the greatest exposures of euro area banks have been to sectors that have been enduring decelerating rates of growth in earnings (cyclical consumer goods, financial and TMT sectors). By contrast, exposures have been lower to sectors which have shown very strong earnings growth (energy and utilities, basic industry and capital goods sectors). Looking ahead, it appears that euro area banks will most notably be exposed to sectors that show less capacity of generating internal funds and thus a lower level of creditworthiness. Consequently, it cannot be excluded that the general decline in euro area loan loss provisions may only prove to be temporary.

### 2.3 BALANCE SHEET CONDITIONS OF THE HOUSEHOLD SECTOR

Lending to households represents an important share of total bank lending in the euro area: as a proportion of the total loans outstanding of euro area banks, households account for almost one-third.<sup>2</sup> This means that the condition of household sector balance sheets is important for the financial condition of banks. In

addition, an important contributor to banking sector profitability over recent years has been lending to households for house purchase. Hence, any deceleration in mortgage lending growth would impinge on banking sector profitability.

<sup>2</sup> This figure, which includes lending to individual enterprises, is based on unconsolidated MFI data on outstanding amounts of loans for June 2005.

So far, there has been little sign of deceleration, but increased competition in the mortgage lending market – spurred to some extent by the favourable risk-weighting of mortgage loans within the Basel II framework – has entailed some narrowing of euro area banks’ interest rate margins on mortgages.

In the third quarter of 2005, the pace of bank lending growth to euro area households remained strong (see Chart S36). The bulk of this growth in lending was for house purchase, as banks narrowed their margins on housing loans against a background of reduced concern as to future housing market prospects, as indicated in the October 2005 ECB Bank Lending Survey. This narrowing of margins was mainly due to the strength of competition in mortgage lending, although banks did tighten their lending standards with regard to riskier mortgage loans. Another factor that contributed to the strength of overall lending growth to households was a pick-up in consumer lending growth. This brought the household sector debt-to-GDP ratio to a new high of 57% in the third quarter of 2005 (see Chart S34).

Notwithstanding the rise in the euro area household sector debt-to-GDP ratio, the sector’s indebtedness has remained low by international standards.<sup>3</sup> From a financial stability perspective, it is not the level of debt that matters per se, but the sustainability of a given level of debt. Ultimately this depends on the ability of households to service outstanding obligations out of income and, possibly, assets in the case of adverse disturbances to income.

In terms of the ability of households to honour their obligations out of income, the total debt servicing burden of the household sector (repayment of the principal and interest payments) is estimated to have remained largely unchanged since 2000, at around 11% of disposable income (see Chart S37). This ratio has remained stable because the increase in household sector indebtedness was offset by the fall in interest rates to low levels.

Debt sustainability is also influenced by the features of mortgage loans. In particular, other factors that may have lowered debt servicing burdens have been a tendency towards greater flexibility in repayment terms and a lengthening of the average maturity of loans (see Box 7). There is also evidence that mortgage-indebted households in the euro area – i.e. those carrying the bulk of the household sector debt – have tended to be in the highest income categories.

Turning to the ability of households to repay debt out of assets, indicators of household sector solvency, such as ratios of debt to liquid financial assets and debt to total financial assets, have remained comfortable (see Chart S35). In other words, the overall household sector had sufficient liquid funds and other financial assets available to repay loans if needed. At a micro level, there is some evidence for the euro area that high-income households, which carry most of the debt, held more assets and liquid assets than others over the period 1994-2001. Moreover, over that period, their ability to save has tended to be higher.<sup>4</sup>

#### HOUSEHOLD SECTOR RISKS

The main sources of risk for household sector balance sheets that can have financial stability implications comprise unexpected disturbances to household incomes, property prices, and interest rates. In particular, any deterioration in financial resources (income flows) or financial commitments (repayment burdens) could imply heightened credit risks for banks.

Compared with the June 2005 assessment, risks facing euro area households are broadly unchanged. However, banks responding to the October 2005 Bank Lending Survey reported a reduced perception of risk, in terms of

<sup>3</sup> See ECB (2005), *Financial Stability Review*, June, Box 6.

<sup>4</sup> See Special Feature C in this issue of the FSR on “Assessing the financial vulnerability of euro area households using micro-level data”.



expectations regarding general economic activity and housing market prospects, in the third quarter of 2005.

### UNCERTAINTY REGARDING INCOME EXPECTATIONS AND THE MACROECONOMY

Evidence based on household-level data tends to suggest that – at least for the period 1994-2001 – changes in households' vulnerability appear to have been notably influenced by developments in household income. This, in turn, is driven by macroeconomic developments and is closely related to developments in the labour market. Therefore, the uncertainty surrounding the outlook for economic activity in the euro area could have implications for employment prospects and the disposable income of euro area households.

Survey results from the European Commission Consumer Survey for the second and the third quarters of 2005 showed a slight deterioration in the way in which euro area households expect their financial situation to develop over the next 12 months. The main reason for this appears to be the perception that employment prospects will not improve significantly in the

near future (see Chart 2.11). It also cannot be ruled out that the financial situation of some households, especially in the lowest-income segments, could be tested by the strength of oil prices.

From a financial stability viewpoint, the impact of any deterioration in household sector income will ultimately depend on the distribution of debt across different categories of households, which face different financial conditions. Although timely estimates are not available, there are some indications that the bulk of household sector debt in the euro area has tended to be held by households in the highest income categories, and this distribution of indebtedness tends to change slowly over time.

### RISKS TO HOUSE PRICES

Euro area residential property prices remained dynamic during late 2004 and into 2005. In both nominal and real terms, for the euro area as a whole, the recent increases are of the same magnitude as the increases during the last housing market peak in the early 1990s (see Chart 2.12).

**Chart 2.11 Euro area households' financial situation and unemployment expectations**

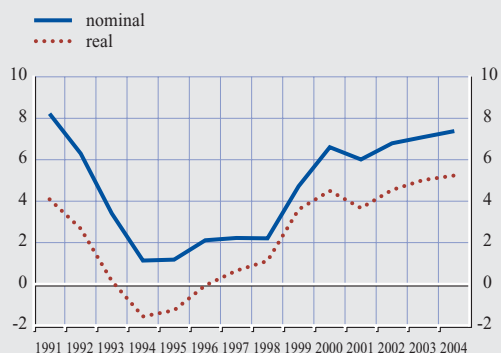
(Q1 1998 - Q3 2005, three-month moving averages of percentage balances)



Source: European Commission Consumer Survey.  
Note: "Balance" refers to the percentage of positive answers minus the percentage of negative answers. An increase in a negative balance indicates less pessimistic expectations overall.

**Chart 2.12 Residential property price growth rate in the euro area**

(1991 - 2004, % per annum)



Sources: National data and ECB calculations.  
Note: Real series calculated using the euro area HICP as a deflator. Euro area series constructed from national series covering more than 90% of the euro area GDP.

This period of strong mortgage lending growth to households in the euro area has in recent years coincided with rising house prices in many euro area countries. Lending for house purchase grew at an annual rate of 8.1% in 2003 and 10% in 2004, and available data for loans for house purchase show a continuation of this pace of growth in 2005 (see Chart S36). At the same time, nominal house prices increased by 7.1% in 2003 and by 7.4% in 2004. For the euro area as a whole, favourable financing conditions and, possibly, the expectation of capital gains appear to have contributed significantly to the recent strength of housing demand, rather than the growth of household disposable income.

The underlying dynamics of the overall euro area index reflect mixed developments at the Member State level. This continues to indicate that there is a strong national dimension to housing markets. Fundamental factors such as real economic activity, demographic changes, policy measures as well as short-run stickiness in supply have contributed to the recent divergent price dynamics in euro area Member States. The indications are that house prices

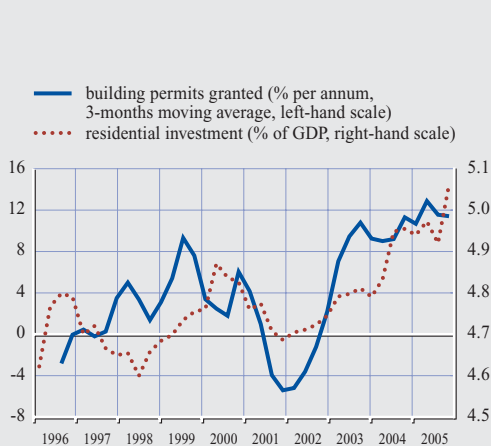
continued to rise in early 2005 in several euro area countries, especially in Spain, France and Ireland. By contrast, in the Netherlands, house prices grew at a moderate rate in early 2005.

Concerning the likely future supply of residential property, which is an important factor for future house price developments, the picture has been somewhat mixed. On the one hand, some indicators, such as building permits granted and the number of house completions, show that the supply side of the housing market has partly responded to the strength of demand (see Chart 2.13). On the other hand, data that have become available in the six months since the June 2005 FSR have shown a deceleration in the growth of construction investment.

Owing to the importance of mortgage lending as a revenue source for banks, developments in residential property prices have become an important factor in the assessment of risks to banking sector stability. In this vein, concerning the valuation of house prices in the euro area, faster growth in house prices than rents has meant rising house price-rent ratios in several countries (see Chart 2.14).

**Chart 2.13 Building permits and residential investment in the euro area**

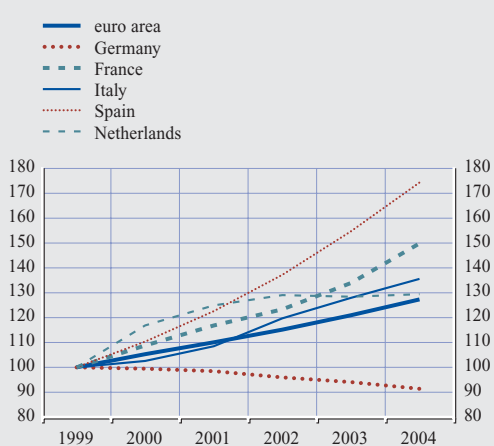
(Q1 1999 - Q2 2005)



Sources: National sources and ECB calculations.  
 Note: Germany is excluded owing to the effect of reunification on aggregate residential investment.

**Chart 2.14 House price-to-rent ratio for the euro area**

(1999 - 2004, index: 1999 = 100)



Sources: National sources and ECB calculations.

To the extent that house price-rent ratios have risen above historical values, this may not necessarily imply an immediate and imminent risk of downward adjustment. Adjustment towards intrinsic values could come either through rising rents or through falling house prices. However, if house prices were to decline, the immediate impact on banks would be felt through income generated from mortgage lending activities and through credit quality. There could also be second-round wealth effects as households change consumption patterns; however, the empirical magnitude of these effects in the euro area remains uncertain.

For the euro area as a whole, an uncontrolled correction in house prices does not appear likely in the short run. Despite this, the continued strength of house prices in some Member States calls for ongoing monitoring and surveillance.

According to the results of the October 2005 ECB Bank Lending Survey, banks continued to see housing market prospects as a reason for tightening lending standards on the granting of mortgage loans. However, they reported a net decrease in the perception of the related risk in the third quarter of 2005. Over the same period, households' more optimistic view regarding housing market developments contributed to an increase in the net demand for housing loans.

#### **INTEREST RATE RISK**

Overall, the interest rate risk facing households in the euro area has not changed in the six months since the June 2005 FSR.

From a financial stability viewpoint, the impact of any change in interest rates on households' debt sustainability depends notably on country-specific mortgage contract features, in particular the interest rate variability regime of the outstanding loans. ECB estimates suggest that around one-third of the total outstanding mortgage debt in the euro area could be exposed in the short run to a change in interest rates.<sup>5</sup>

The balance sheets of new borrowers could be more sensitive as a greater proportion of them are indebted at variable rates. While this might be true for some individual countries, at the euro area level, however, the share of new mortgage loans at floating rates and with a period of interest fixation of up to one year has recently decreased (47% in August 2005, compared with a peak of 59% in November 2004). At the same time, the share of new mortgage loans with a period of interest fixation of over ten years had, by August 2005, increased to its highest level over the last two years, standing at 22%.

Finally, a factor mitigating the overall sensitivity of household mortgage debt to interest rate changes might be the increased diffusion of variable rate products, whereby an increase in the interest rate translates into a longer repayment period, with the monthly payment remaining unchanged (see Box 7). However, this could be seen as merely postponing the increase in the burden, raising the issue of outstanding debt sustainability over a longer time period.

#### **ASSESSMENT OF HOUSEHOLD SECTOR RISKS**

All in all, even though euro area household sector indebtedness has continued to rise, it does not appear to constitute a threat to the stability of the euro area financial system in the near term. Debt servicing burdens have remained stable, and aggregate household sector solvency remains comfortable. Moreover, indications are that the most heavily indebted households in the euro area also tend to be those in the highest income categories.

Looking ahead, the risks facing the euro area household sector as a whole have not changed significantly in the past six months, the main short-term risk being related to macroeconomic developments, especially income prospects.

<sup>5</sup> This is due to the importance in many countries of fixed or quasi-fixed interest rate mortgages (i.e. with long initial periods of interest rate fixation). See ECB (2004), *Financial Stability Review*, December, Box 6.

However, some areas of vulnerability remain. The distribution of risks to financial stability emanating from the household sector are spread unevenly throughout the euro area. Differences exist across countries in terms of debt levels, contractual interest rate variability, the length of loan terms, and house price developments. It cannot be ruled out that at least some of the cross-country differences in debt may be due to different equilibrium debt levels.

Some of the countries that have experienced substantial increases in house prices in recent

years have a high proportion of variable rate debt. This may amplify the effects of any interest rate changes, especially for households with high levels of outstanding debt, low housing equity, low financial asset buffers and/or uncertain employment and income prospects. Moreover, a substantial reversal of house prices may entail capital losses with an impact on household balance sheets, which could also indirectly affect banks. Hence, the continued strength of house prices in some Member States calls for ongoing monitoring and surveillance.

#### Box 7

#### THE INFLUENCE OF MORTGAGE PRODUCT INNOVATIONS ON RISKS TO HOUSEHOLD DEBT SUSTAINABILITY

In an environment of strong competition, banks in the euro area have been offering new mortgage products targeted at a larger number of borrowers. With these new products, two previous obstacles to borrowing have been removed. First, it is now possible in some countries for households to borrow higher amounts with little or no down payment, through higher loan-to-value ratios. Second, in a number of countries, other products have become available, allowing middle and lower-income borrowers to alter repayments relative to their financial resources, while borrowing larger amounts than might have been possible in the past. This has mainly been achieved by extending the average loan maturity (up to 30-35 years in some countries). This Box reviews the specific features of these mortgage products and their implications for the sustainability of household debt.<sup>1</sup>

In many euro area countries, banks are increasingly offering a variety of types of innovative mortgage products. First, “accordion” variable rate mortgages offer the option of keeping the monthly instalment constant, even in the case of a change in the interest burden, the adjustment being made through an extension of the loan maturity. In the euro area, such products exist in Belgium, Italy, Spain, France and Greece. Second, mortgage products are now increasingly offering a wide range of flexible repayment options (such as deferred start, payment break or reduced starting payments), allowing borrowers to match their repayments to their cash flows, which can be affected by seasonal increases in expenses (for instance, a “payment holiday” can be granted for one or two months during the summer or at the end of the year). Finally, “interest-only” or “amortisation free” mortgage loans allow the deferral of the payment of the principal for a given period or even until the end of the loan.

According to a recent study,<sup>2</sup> interest-only products are now available in most euro area countries (with the exception of Finland; no information was reported for Austria, Greece and

<sup>1</sup> Other types of mortgage products have recently appeared, such as equity release loans, foreign currency loans and reverse mortgages. However, this Box focuses on innovations that have the greatest impact on households’ monthly repayment burden.

<sup>2</sup> See London Economics (2005), “The Costs and Benefits of Integration of EU Mortgage Markets”, Report for the European Commission, DG Internal Market and Services, August.

Luxembourg). In the Netherlands survey results indicate that 41% of outstanding mortgages were interest-only in 2003<sup>3</sup>; they also tend to be more common among lower-income households. However, it is unlikely that interest-only mortgage loans in the Netherlands are granted to finance the total value of the property. They are rather often used in combination with another type of loan, or as a second mortgage, for instance to finance renovations. Moreover, Dutch banks tend to grant interest-only mortgages with rather conservative loan-to-value ratios. In Spain, most mortgage lenders now offer a wide range of products with more flexibility in repayment schemes. They have recently started to grant mortgages under which borrowers pay only interest for a period of one to three years. In France, loans with a deferred capital repayment are only granted in special cases (e.g. subsidised loans and student loans). Interest-only loans, whereby the repayment occurs at the end of the loan duration, are mostly granted to investors for buy-to-let purposes, to take advantage of particular fiscal schemes. They are often offered together with an investment product, allowing the lump sum for repayment to be built up.

Typically, interest-only mortgage products were originally designed for wealthier households, which tended to use them as a cash management tool – investing the cash freed up during this period at a higher return – and which were able to sell, if necessary, financial assets to pay off the loan amount. They were also suited for households with irregular income, but able to make voluntarily early principal repayments when they have more income, or for young households expecting their income to rise sharply in the near future. However, for many “ordinary” borrowers, such flexible mortgage products have now become the best financing option, allowing them to overcome the financial hurdle to home ownership brought about by the recent increase in house prices, and to adapt their repayments to the pattern of their financial resources.

However, innovative mortgage products do potentially contain certain specific risks. A longer loan duration and amortisation period entail a higher probability that the household could face debt sustainability problems, for instance caused by a period of unemployment with a lower income, or loss of income altogether. With regard to interest-only loans, they might be a good choice for buyers intending to move or refinance – and therefore repay the principal – before or at the end of the interest-only period. However, after the initial amortisation-free period, borrowers could face a sudden, sharp increase in their financial burden for which they might be unprepared. Moreover, should house prices decline, there is a higher risk that households would be left with low or even negative net housing equity, the outstanding balance of the loan exceeding the value of their houses. Finally, the total amount of interest paid will be higher over the term of the loan.

<sup>3</sup> See P. J. A. van Els, W. A. van den End and M. C. J. van Rooij (2005), “Financial Behaviour of Dutch Households: Analysis of the DNB Household Survey 2003”, *BIS Papers No 22 – Investigating the Relationship between the Financial and Real Economy*, April.

In the euro area, quantitative information on these new mortgage products is scarce, making it difficult to assess the overall financial stability implications. However, some lessons can be drawn from recent developments in the US, where the growing popularity of interest-only mortgages has recently raised financial stability concerns.<sup>4</sup> Interest-only mortgages (deferring principal payments for a period of three to ten years) are now being offered by most lenders, and represented a third of home purchase loans originated in 2004<sup>5</sup>, up from 5% in 2003. However, the amortisation-free period is substantially longer than in the euro area (up to half the total duration of the loan), potentially resulting in a high increase in the monthly payments at the end of this initial period (anecdotal evidence suggests that the monthly payment could jump by 50%, even in the absence of any interest rate rise).

Available products in the US also include option adjustable rate mortgages (ARMs), or flexible ARMs, allowing the borrower to choose a repayment scheme whereby payments in the initial period (five to ten years) might cover in extreme cases only a part of the interest payment, the remainder being added to the outstanding loan balance to be repaid later. There are also concerns that these higher-risk ARMs are increasingly being offered to riskier borrowers, who may face greater difficulties adjusting to the rise in their monthly payments at the end of the initial period. However, at present such products, which could potentially result in a “negative” amortisation of the loan (meaning that the outstanding balance increases over time instead of decreasing, as a result of accumulated deferred interest payments), do not appear to be available in the euro area.

From a financial stability viewpoint, while the innovative mortgage products that are becoming increasingly available in the euro area allow households to keep their monthly debt servicing burdens at reasonable levels in the short run, longer-term risks could be increasing, especially as the ability of households to make large principal repayments after a considerable period of time is largely untested. This would call for closer monitoring of how the nature of risk-sharing in mortgage lending is being altered by product innovation.

4 See Federal Reserve Board, Monetary Policy Report submitted to Congress on 20 July 2005, which states that “Recently there has been increased use of potentially riskier types of mortgages, including adjustable-rate and interest-only loans, which could pose challenges to both lenders and borrowers.”

5 According to data from the real estate information firm Loan Performance (see for instance the annual report on “The State of the Nation’s Housing 2005”, issued by the Joint Center for Housing Studies at Harvard University). These data refer to loans packaged for resale as mortgage-backed securities, and thus do not cover the entire market.





## III THE EURO AREA FINANCIAL SYSTEM

### 3 EURO AREA FINANCIAL MARKETS

*Since the June 2005 FSR, conditions in the euro area money market have remained favourable, as perceptions of counterparty credit risks were rather low and participants could smoothly manage their liquidity needs. Despite an aggressive global hunt for yield, yields in the euro area bond markets appear to be less of a conundrum than in the US. However, any significant upturn in long-term bond yields, either possibly induced by a reappraisal of risks or transmitted from the US bond markets, remains an important source of risk for the functioning of the euro area capital markets. In addition, a rise in euro area short-term risk-free interest rates would be unlikely to leave the bond markets, especially the corporate segments, unaffected. In turn, upside risks to risk-free interest rates and the credit risk premium could also lead to a revaluation of pricing in euro area equity markets, especially in connection with a disorderly unwinding of global imbalances, and given that the earnings cycle is probably close to its peak.*

#### 3.1 KEY DEVELOPMENTS IN MONEY MARKETS

##### MONETARY POLICY RATES REMAIN UNCHANGED IN THE EURO AREA

From a financial stability viewpoint, conditions in the euro area money market are important for at least two reasons. First, the ECB implements its monetary policy in this market, and effective implementation requires the market to function smoothly. Second, banks usually secure their liquidity needs in this market. Because of this, the smooth functioning of the money market can contribute to the stability of the banking system as a whole.

There has been no change in the level of monetary policy interest rates in the euro area since June 2003, with the minimum bid rate for the main refinancing operations remaining at 2% since then. At the time of the June 2005 FSR, market participants had been expecting that the ECB would raise its interest rates by

25 basis points in the second quarter of 2006. However, supported by some recent economic growth data and upward revisions in the forecasted inflation rates, market participants' expectations of a rate hike by the ECB have recently been brought forward. By early November 2005, expectations of a 25 basis point interest rate hike by the ECB, as derived from money market derivatives prices, had shifted to the first months of 2006.

##### GENERAL MONEY MARKET CONDITIONS REMAIN FAVOURABLE

From a financial stability viewpoint, general money market conditions in the euro area money market remained favourable for the following three reasons.

First, perceptions of counterparty credit risks in euro area money markets remained rather low. These perceptions can be revealed in patterns of interest rate spreads between uncollateralised interbank money market rates and collateralised repo rates. Fears that Ford and GM would be downgraded by credit rating agencies, followed by the actual event, appeared to have some, albeit limited and short-lived, impact on very short-term spreads in the early months of 2005 (see Chart S38). Overall, these spreads have changed little and have remained low across all short-term maturities over the past six months.

Second, the secured money market segment<sup>1</sup> continued to grow relative to the unsecured segment, and is now the largest money market segment in the euro area, as the 2004 ECB Euro Money Market Survey revealed (see Box 8). This is a positive development from a financial stability viewpoint, as it suggests that money market counterparties are showing an increasing preference for limiting their counterparty risks.

Third, liquidity conditions in the euro area money market remained favourable. Liquidity conditions across different segments and

<sup>1</sup> Often referred to as the repo market segment.



maturities of the money market can be evaluated by the monitoring of patterns in bid-ask spreads (see Chart S39). Already low in early May 2005, bid-ask spreads at the one and three-month maturities for EONIA swap rates have narrowed further over the past six months. While the further narrowing of these spreads can be seen as a sign of high market liquidity, suggesting that, on aggregate, market participants have faced little difficulty in accessing short-term funding, it also reflects the increasing use of electronic trading platforms. As discussed in the June 2005 FSR, it cannot be excluded that, by eroding buffers for market movements, very tight bid-offer spreads could adversely affect risk-return trade-offs in market-making activity.<sup>2</sup>

### 3.2 KEY DEVELOPMENTS IN CAPITAL MARKETS

#### GOVERNMENT BOND MARKETS

In the euro area fixed income markets, after May 2005, long-term government bond yields – which set a benchmark for the level of longer-term risk-free interest rates – reached historical lows of 3.1% in September 2005 against a background of high oil prices, and in the immediate aftermath of Hurricane Katrina.

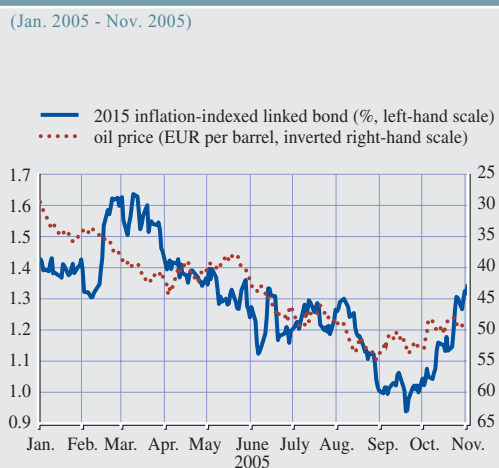
Thereafter, long-term government bond yields edged up to around 3.5% in early November 2005.

Underlying the drop in nominal euro area long-term bond yields in the course of 2005 has been a significant decline in real long-term interest rates to very low levels. Rising oil prices seem to have been one of the important factors accounting for the drop in long-term real rates (see Chart 3.1). The rise in oil prices appeared to lead to concerns among market participants about prospects for economic growth rather than inflation. Apart from the negative impact on real yields through lower euro area growth expectations, the rise in oil prices may also have led to a strengthening of demand for long-term bonds by oil-exporting countries, through investing their oil revenues to some extent in euro-denominated bonds.

By contrast with patterns in the US market yield curve, which almost became inverted in late 2005, the euro area yield curve remained comparatively steep (see Chart 3.2). As a consequence, euro area yield curve carry trades became relatively attractive, especially when

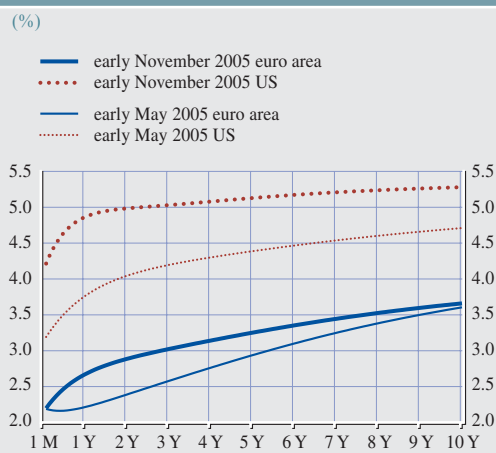
<sup>2</sup> See ECB (2005), *Financial Stability Review*, June, Box 7.

**Chart 3.1 Euro area 15-year real bond yield and oil price**



Sources: BIS, Bloomberg, Reuters and ECB calculations.

**Chart 3.2 Euro area and US yield curves**



Sources: Reuters and ECB calculations.  
Note: The yield curves are estimated using an extension of the Nelson-Siegel method applied to zero-coupon swap rates.

investors did not exclude the possibility of downward pressure on the US dollar stemming from wide external imbalances (see Section 1). The steepness of the euro area yield curve has also served to support the interest rate margins of euro area banks, as banks traditionally fund long-term assets (e.g. loans) with short-term liabilities (e.g. deposits).

#### Box 8

### STRUCTURAL TRENDS IN THE EURO MONEY MARKET

The fifth study on the structure and functioning of the euro money market was conducted in early 2005 by the ECB together with the 15 national central banks (NCBs) that were members of the European System of Central Banks (ESCB) before 1 May 2004.<sup>1</sup> The study was based on turnover data collected from banks covering the second quarters of 2003 and 2004. This Box reports on some of the main findings of this study, and draws attention to the following three main findings. First, although changes in the aggregate turnover of the euro money market were limited between the second quarters of 2003 and 2004, there were some notable compositional changes, especially in terms of growing activity in secured relative to unsecured market. Second, overall activity in the euro money market became less concentrated, although large differences have remained across market segments. Third, the growing use of electronic platforms to make transactions in many market segments produced a further narrowing of bid-offer spreads.

Following the rise that took place between 2000 and 2003, aggregated turnover in the euro money market appeared to stabilise in Q2 2004 (see Chart B8.1). This was due to offsetting patterns in different segments of the market. Although activity fell in the overnight index swap (OIS) market as well as in the cross-currency and foreign exchange swaps markets, there was a rise in turnover in the unsecured, secured, other interest rate swap (IRS), forward rate agreement (FRA) and short-term securities segments (see Chart B8.2). Furthermore, as in Q2 2003, the secured segment remained the largest money market segment in Q2 2004, accounting for around 36% of total market turnover.

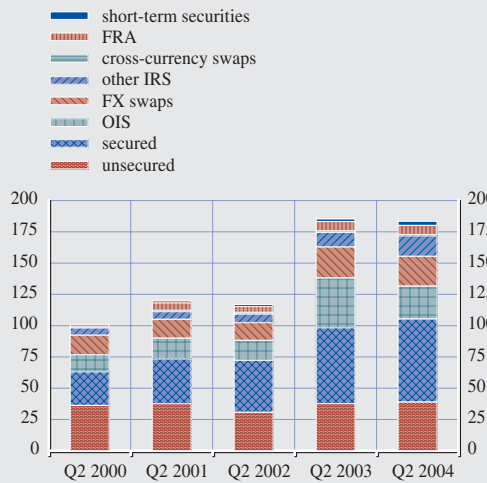
The increasing share of secured transactions can be seen positively from a financial stability point of view, as it shows that market participants have a preference for limiting their credit risk exposures. A further development related to the increase in the secured market segment was a substantial increase in tri-party repo activity.<sup>2</sup> This also reduced the counterparty and operational risks related to settlement.

The degree of concentration in money market activities can provide an indication of both the market's dependency on individual institutions and the risks for market functioning if a significant counterparty were forced to exit. There are indications that the overall level of activity in the euro money market has become less concentrated in recent years. Nevertheless, degrees of concentration vary widely across different market segments. The least concentrated segment of the money market in Q2 2004 was the unsecured segment, where the ten most active

1 See ECB (2005), *Euro Money Market Study 2004*, May. The study is based on data received from a sample of credit institutions, implying that the findings must be interpreted with caution, as they are not necessarily representative of the euro money market as a whole.

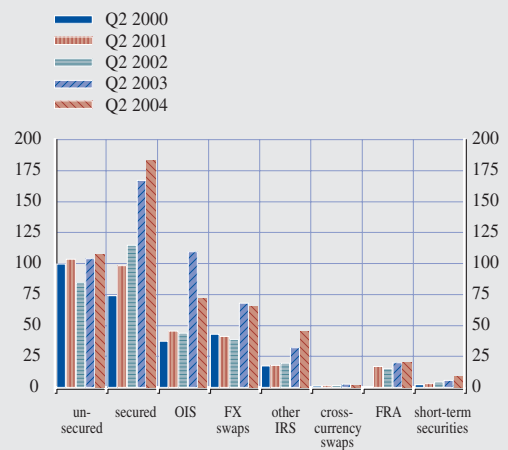
2 A tri-party repo is a repo that involves a third party, commonly a custodian bank, acting as an agent to exchange cash and collateral for one or both counterparties.

**Chart B8.1 Aggregated turnover in the euro area money market**



Source: ECB.  
Note: The Q2 2000 volume is taken as a base. No data on FRA turnover were available in 2000.

**Chart B8.2 Average daily turnover by money market segment**



Source: ECB.  
Note: The Q2 2000 unsecured volume is taken as the base. No data on FRA turnover were available in 2000.

institutions accounted for around 35% of the total turnover. However, some segments have remained highly concentrated. For instance, the FRA, other IRS and cross-currency swap segments remained highly concentrated: the ten most active institutions in each of these segments accounted for around 70% of total turnover (see Table B8.1).

Concerning the integration of the euro money market, the most relevant change in the geographical counterparty structure in Q2 2004 was the loss of predominance of transactions with national counterparties for short-term securities. Indeed, in the short-term securities (and cross-currency swap) segments, cross-border transactions with other euro area counterparties became the highest among all market segments (see Chart B8.3). From a financial stability viewpoint this development is important as it reduces country-specific risks by spreading risks more widely. By contrast, however, the share of transactions with national counterparties remained relatively high in the secured market segment, indicating that the integration of national repo markets across the euro area continued to proceed at a slower pace.

**Table B8.1 The share of the five and ten largest banks in total activity in OTC derivatives market**

(%, Q2 2004)

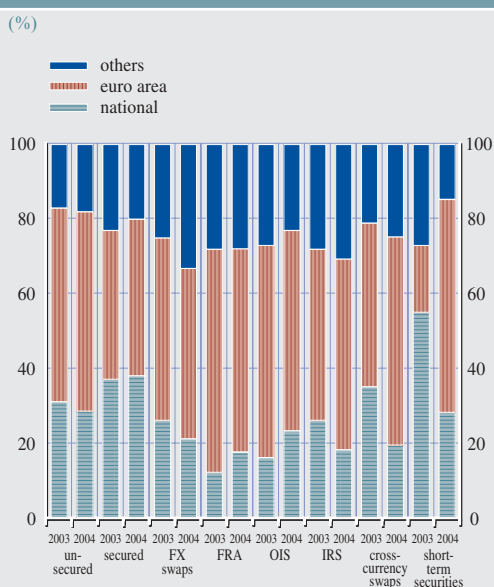
	OIS	other IRS	FRAs	FX swaps	cross-currency swaps
top 5 banks	42	62	57	38	52
top 10 banks	62	79	78	64	75

Source: ECB.

Finally, the following two additional structural developments were observed in the euro money market. First, electronic trading continued to grow in Q2 2004 in most market segments (e.g. in the secured, IRS and foreign exchange swap segments), and especially in the secured market segment (see Chart B8.4). While electronic trading accounted for a very large share of total activity in the secured markets, it has remained rather small in most of the other over-the-counter (OTC) derivatives markets.

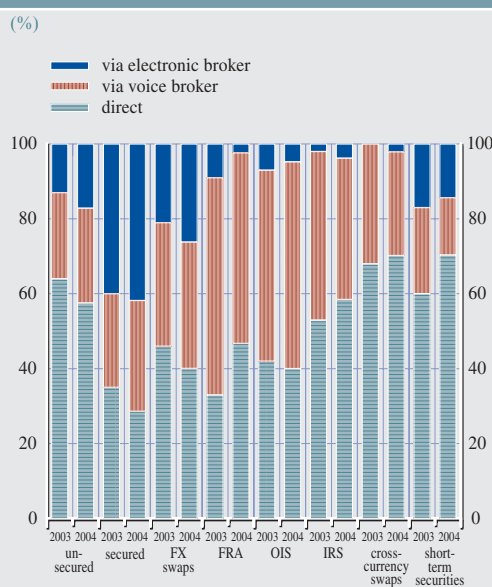
Overall, the increasing share of electronic trading in some segments of the euro money market can be seen as a positive development from the market's viewpoint, as it can enhance the price discovery process and liquidity, reduce operational risks, and lower the cost of trading. However, in the case of abnormal market conditions, the role of electronic trading platforms, especially those of quote-driven systems, can have a destabilising effect on the functioning of markets and can for example lead to sudden withdrawals of liquidity from the markets.<sup>3</sup> Second, the creation of the EONIA Swap Index<sup>4</sup> by EURIBOR-ACI will probably further stimulate the development and enhancement of the overnight swap market segment, since it should provide a new benchmark for derivatives markets. By improving the choice of instruments available to market participants for hedging against, or speculating on interest rate risks, the development of derivatives products in the euro money markets should contribute positively to financial stability by facilitating the dispersion of risks.

Chart B8.3 Geographical counterparty structure by money market segment



Source: ECB.

Chart B8.4 Trading structure by money market segment



Source: ECB.

<sup>3</sup> See, for instance, ECB (2005), *Financial Stability Review*, June.

<sup>4</sup> The EONIA Swap Indices were calculated for the first time on 20 June 2005.

Other factors that appear to account for the very low level of real long-term interest rates in the euro area include higher demand for assets with long durations from institutional investors (e.g. pension funds and life insurance corporations) eager to close balance sheet mismatches, motivated in large part by regulatory changes and in anticipation of proposed legislation (see Chart 3.3).

Another structural development which might contribute to a low level of bond yields is the increasing savings activity of the baby boom generation and the ageing population in general.<sup>3</sup>

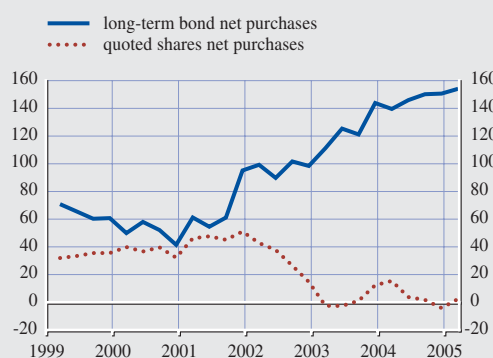
A further factor that may have contributed to the lowering of euro area bond yields is growing exchange rate diversification away from the US dollar on the part of Asian and other central banks. Some studies suggest that this tendency could increase if the US dollar were to depreciate against the euro in the period ahead.<sup>4</sup>

Concerning the risks in euro area bond markets, the level of yields appears to be less of a conundrum than in the US, given the steeper euro area yield curve and lower (potential) economic growth expectations. As a corollary, the risk of an unexpected and significant rise in euro area bond yields would appear to be lower than in the US. Nevertheless, it seems unlikely that a significant upturn in long-term bond yields in the US would leave euro area bond markets unaffected.

Indicators of the balance of risks to long-term bond yields in the period ahead as perceived by market participants pointed throughout 2005 to continued concerns about the possibility of a sudden rise in long-term bond yields. The option-implied skewness – a measure of the degree of asymmetry in the probability distribution of likely outcomes – remained significantly positive in late 2005 (see Chart S40).

**Chart 3.3 Net purchases of long-term bonds and equities by euro area insurance corporations and pension funds**

(Q1 1999 - Q1 2005, EUR billions, one-year moving cumulative purchases)



Source: ECB.

## CORPORATE BOND MARKETS

Corporate bond spreads in the euro area at the lower end of the rating spectrum reached historical lows in early 2005, but widened significantly later on (see Charts S47 and S48). While first the fear of and ultimately the actual downgrading of Ford and GM at the start of 2005 played some role in this (see Box 9), the strong reversal in the course of 2005 can also be attributed to changing fundamentals of euro area corporations, other firm-specific news, and factors related to market dynamics.<sup>5</sup> For instance, there have been indications that the corporate earnings cycle may have turned in early 2005 (see Box 6). In addition, the pace of corporate balance sheet repair has slowed down (see Section 2).

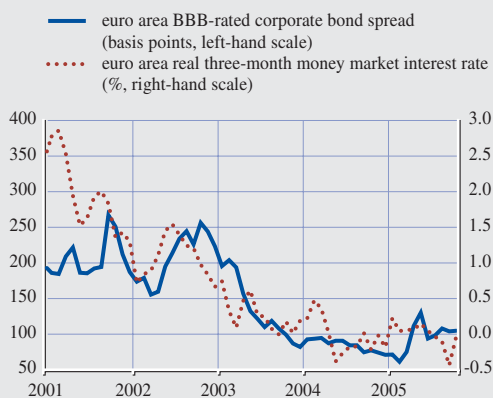
3 For a more in-depth analysis of both structural developments, see "Ageing and Pension System Reform: Implications for Financial Markets and Economic Policies", report prepared at the request of the Deputies of the Group of Ten, October 2005; and A. Maddaloni, A. Musso, P. Rother, M. Ward-Warmedinger and T. Westermann (2005), "Macroeconomic Implications of Demographic Developments in the Euro Area", *ECB Occasional Paper*, forthcoming.

4 See M. D. Chinn and J. A. Frankel (2005), "Will the Euro Eventually Surpass the Dollar as Leading International Reserve Currency?", *NBER Working Paper*, No W11510, August.

5 See ECB (2005), *Monthly Bulletin*, June, Box 3.

**Chart 3.4 Euro area BBB-rated corporate bond spread and the real short-term interest rate**

(Jan. 2001 - Oct. 2005)



Sources: Bloomberg, Eurostat and Reuters.

following a prolonged period where corporate bond markets benefited from an aggressive hunt for yield in an environment of ample (global) liquidity and low real interest rates. Patterns in EDFs, where little upturn was seen, differed from those in corporate bond markets during 2005. EDFs are, however, projected to be higher in 2006 than in 2005.

In the period ahead, a possible trigger for a continued widening of spreads could be a rise in the real short-term risk-free interest rate, since past experience shows a positive relationship between the BBB-rated corporate bond spread and the real short-term risk-free interest rate in the euro area (see Chart 3.4).<sup>6</sup>

To some extent, the widening of spreads of lower quality issuers may also partly reflect more prudent pricing of corporate default risk,

<sup>6</sup> See G. de Bondt (2004), "The Balance Sheet Channel of Monetary Policy: First Empirical Evidence for the Euro Area Corporate Bond Market", *International Journal of Finance and Economics*, 9, 3, pp. 219-28.

## Box 9

### DEVELOPMENTS IN THE EUROPEAN CREDIT DERIVATIVES MARKETS

European credit derivatives markets have, like their US counterparts, experienced rapid growth in the past few years. If history is a guide, such rapid growth is often accompanied by an increased potential for instability should conditions take a turn for the worse. This Box discusses the financial stability implications of recent events in these markets.

In May 2005 the credit ratings of GM and Ford, both global car makers and major issuers of corporate debt, were downgraded by all three major credit rating agencies: Standard and Poor's and Fitch lowered their ratings to speculative grade, while Moody's cut its ratings to the lowest investment grade before also classifying them as non-investment grade in August 2005. GM's ratings were downgraded still further following the filing for bankruptcy of its major parts supplier and former subsidiary Delphi Corp. in October 2005. At the time of the first downgrades, GM and Ford had global debt outstanding of USD 453.1 billion. According to Lehman Brothers, one of the leading providers of bond indices, outstanding bonds from GM and Ford eligible for European high yield index inclusion totalled €12.5 billion and €8.2 billion respectively, representing 27.7% of the new high-yield European market.

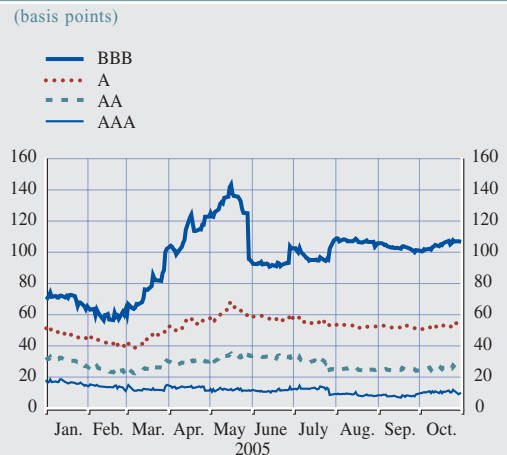
The May 2005 downgrades led to a very sharp, although only temporary, widening of yield spreads in the credit markets. The sharp spread widening in the cash market was reversed relatively quickly, and by June 2005, spreads had already retraced part of their widening and had come back to their April levels, narrowing still further during July and August 2005. Both issuers actually returned to the market in July, issuing new debt at yield levels not much higher than before the downgrades. The smooth performance of the cash markets can be attributed to

**Chart B9.1 iTraxx five-year CDS spreads**



Source: Bloomberg.

**Chart B9.2 Corporate bond spreads in the euro area**



Source: Thomson Financial Datastream.  
 Note: Spread between seven to ten-year yield to maturity and euro area seven to ten-year government bond yield.

several factors, namely: the anticipation of the downgrades, reflected in the spread widening of the two issuers and the markets in general since at least mid-March<sup>1</sup> (see Charts B9.1 and B9.2); a more flexible management of portfolios by fixed income managers, using more customised benchmarks and increased tracking error possibility adopted after the disorderly market action of WorldCom's downgrade in 2002; and the continuing strength of credit fundamentals and corporate earnings, with European high-yield default rates remaining very low for several years. The effects of the October 2005 GM downgrade, triggered by the Delphi Corp. filing for bankruptcy, on its corporate debt prices may turn out to be longer-lasting, and the outcome will depend on additional factors (e.g. negotiations with trade unions and future developments in car sales).

The rapid development of credit derivatives is another reason for the relatively smooth behaviour of the corporate bond markets. Cash bond investors can effectively unwind their exposures to individual bond issuers or to entire sectors through the use of credit derivatives. This gives investors the possibility to withstand the immediate impact of possible downgrades and would make it less urgent to liquidate the affected issuers' bond holdings. On the other hand, investors involved in trading-oriented strategies typically prefer to stay away from the cash bond market as the credit derivatives markets offer them greater flexibility and liquidity. The resilience of the cash bond markets to adverse market events has thus been strengthened relative to the situation before the emergence of the credit derivatives markets.

While it seems that credit derivatives markets have to some extent sheltered the cash market from a rise in volatility after the credit event, some segments of the credit derivatives markets have themselves experienced significant market upheaval. The launch in June 2004 of a new

<sup>1</sup> Further evidence of the market's anticipation can be found in the increased use of the two issuers' credit default swap (CDS) contract terminations, which could be observed even before the downgrades were announced, and continued at a strong pace afterwards. By cancelling "redundant" contracts on dealers' books without significantly changing the market risk profile of their positions, the terminations reduce not only their exposure to the issuers but also legal and operational risks. For a more detailed description of the derivatives contract terminations, see ECB (2005), *Financial Stability Review*, June, Box 17.

single family of credit default swap (CDS) indices<sup>2</sup> – iTraxx in Europe and Asia and CDX in North America – has facilitated the development of a liquid secondary market for standardised index tranches that allows investors to express a view on spread direction and default correlation. In their search for high returns, trading-oriented and leveraged investors concentrated on buying the high yielding iTraxx equity tranche (i.e. selling credit protection by betting on a low level of defaults). Assuming that credit spreads on different tranches will continue to move in parallel, as they had done until spring 2005, many investors delta-hedged against spread widening by selling the more senior and lower yielding (the so-called mezzanine) tranches (which are less exposed to default risk, but more exposed to spread risk). Such a hedge is in principle neutral to the parallel move in credit market spreads that occurs when default correlations in the underlying asset portfolio remain broadly constant. However, the GM and Ford downgrades have increased the *idiosyncratic* risk of some names and industries within the underlying portfolio. This led to a dispersion and widening of spreads within the equity tranche, causing prices to fall. As a result, some investors were forced to unwind their exposures due to mark-to-market losses, and the price of the equity tranche fell further. On the other hand, the spreads of the mezzanine tranches narrowed, and prices rose; investors thus lost money on both legs of the position.

It was notable that the market for synthetic CDOs – which consists of large pools of CDSs – remained largely unaffected, as these instruments are mainly held to maturity by investors who usually do not follow short-term trading strategies. The low concentration of single names in the underlying portfolios – which is the result of the lessons from previous events such as Parmalat, where exposures reached up to 6% in a number of CDOs – meant that the vast majority of the CDO tranches that included the two carmakers remained unaffected by the rating changes. With higher portfolio diversification, the CDO market is now more able to cope with idiosyncratic shocks. As a consequence, CDO primary market volumes remained strong, indicating sustained interest by investors, as the overall fundamental situation has not changed. This effect was even more pronounced after the downgrades in October 2005, as rating agencies reported that Delphi was referenced in more than a third of synthetic CDOs, and GM in even more. Nevertheless, the immediate impact on the ratings of CDOs was rather mild, due both to diversification effects and gradual adjustments of the tranches' ratings over time (Delphi's ratings, for example, had fallen from investment grade at the end of 2004 to default by October 2005).

From a financial stability point of view, the main lesson to be drawn from the incident is that recent structural innovations in credit risk transfer markets have extended linkages between CDOs, corporate bonds and credit derivatives markets, and have thereby altered pricing dynamics. On one hand, the evolution of credit derivatives has allowed a smoother handling of price adjustments in the underlying cash market and has helped to diminish the market impact of mechanical bond index changes. The iTraxx credit indices have also proven their value as a hedging instrument during stressed market conditions. High levels of activity and contracting bid-offer spreads even under market stress have shown that CDS indices are now traded in Europe with a sustained level of liquidity. On the other hand, the tensions in the index tranche

<sup>2</sup> For a more detailed description of tradable CDS indices, see ECB (2005), *Financial Stability Review*, June, Box D.2. These indices have also made pricing more transparent, since CDS indices provide a market estimation of default correlation. As a consequence, trading-oriented investors, mainly hedge funds, which had previously concentrated on single-name CDS and avoided portfolio credit derivatives because of their unsatisfactory liquidity and price transparency, have rapidly entered the standardised market for CDS indices and index tranches.



market showed quite clearly that while the increased participation of hedge funds in all major segments of the credit markets adds liquidity, it also raises the potential that a liquidity squeeze and price dislocation could spread across multiple, interconnected credit markets. Since hedge funds' investments in credit markets tend to be highly leveraged, their potential impact on markets can be much greater than the notional size of these investments.

### EQUITY MARKETS

Euro area stock prices continued to rise after May 2005, reaching their highest levels since early 2002 (see Chart S41). In the second half of 2005, the small and mid-cap segments of the euro area stock markets reached all-time highs (see Chart 3.5), whereas large caps remained about 30% below the peak of March 2000.

The factors supporting the stock markets included continued low risk-free interest rates, double-digit growth in earnings (see Box 6), and low stock market volatility (see Chart S43). Moreover, the earnings estimates made both by brokers and companies were consistently revised upwards on a net basis between May and October 2005 (see Chart 3.6).

A further factor that might have explained the outperformance of the euro area stock market

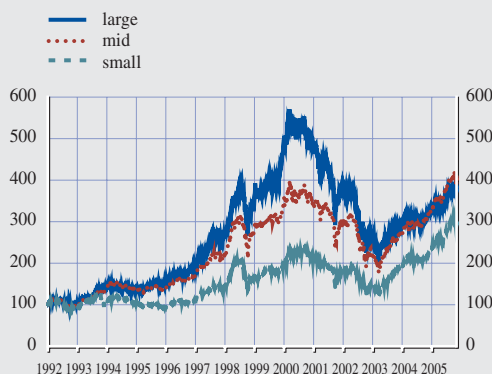
vis-à-vis the US was the depreciation of the euro against the US dollar (see Chart 3.7).

Euro area stocks were popular among fund managers after May 2005, who, according to surveys, continued to overweight euro area equities.<sup>7</sup> This overweighting relates to the fact that surveyed fund managers viewed euro area equities as being intrinsically undervalued. The plethora of flows into hedge funds and limited non-equity investment opportunities could also have prompted some hedge funds to shift more money into euro area equity holdings, as some market participants have suggested.

<sup>7</sup> See Merrill Lynch (2005), "Anything but US equities", *Global Fund Manager Survey*, October.

**Chart 3.5 Dow Jones EURO STOXX total return index**

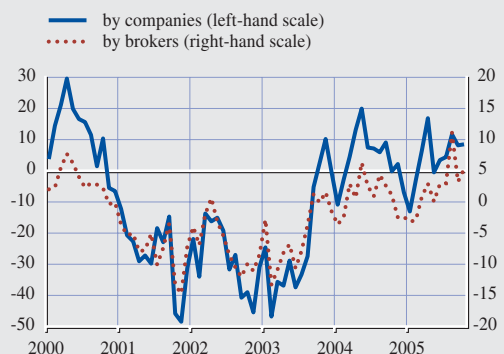
(Jan. 1992 - Nov. 2005, index: Jan. 1992 = 100)



Source: Dow Jones EURO STOXX.

**Chart 3.6 Dow Jones EURO STOXX earnings revisions ratio**

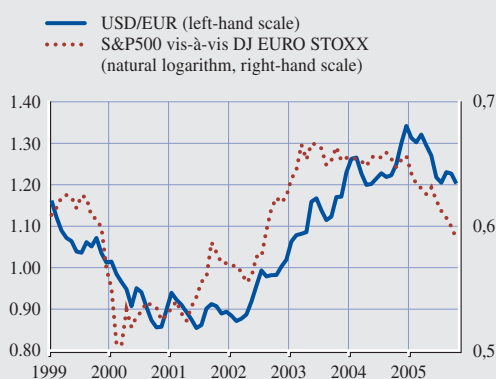
(Jan. 2001 - Oct. 2005, %)



Source: Thomson Financial Datastream.  
Note: The revisions ratio is the difference between the numbers of earnings estimates revised upwards and downwards by respectively companies and brokers as a proportion of the total number of earnings estimates.

**Chart 3.7 Relative performance between euro area and US stock prices and EUR/USD exchange rate**

(Jan. 1999 - Oct. 2005)



Source: Thomson Financial Datastream.

area stock prices in 2005 may in the end peter out. For instance, the pace of corporate earnings growth has shown signs of deceleration, and analysts' expectations point towards a further slowdown. Moreover, as expectations adjust, positive earnings surprises cannot be expected to provide ongoing support to the market. At the same time, some upside risks remain for long-term risk-free interest rates which, if they were to crystallise, and especially in connection with a disorderly unwinding of global imbalances, could lead to a reappraisal of pricing in equity markets. In addition, if corporate bond spreads were to widen significantly, this could trigger a turn in the euro area equity markets.<sup>8</sup>

Notwithstanding the fact that institutional investors considered euro area stock prices to be undervalued, some stock market valuation metrics such as the price-earnings (P/E) ratio based on ten-year trailing earnings have remained rather high (see Chart S42).

High valuations in euro area stock markets may also provide some explanation for the buoyancy of SPO activity in the euro area in 2005 (see Chart S46). The total value of annual SPO deals came very close to the peaks observed in mid-2000 and mid-2001. At the same time, IPO activity remained substantially lower at levels earlier observed in end-2001 and early 1999.

Looking at the risks to euro area equity markets, stock market uncertainty derived from the distribution of options prices increased in the second half of 2005, showing both stronger upward and downward risks (see Chart S44). Investors perceived in October 2005 a higher likelihood of stronger increases or decreases in euro area equity prices. A similar picture emerges from implied stock market volatility, which crept slightly up in October 2005 (see Chart S43).

However, it cannot be excluded that some of the factors that have contributed to rising euro

<sup>8</sup> For empirical evidence, see G. de Bondt (2005), "Does the Credit Risk Premium Lead the Stock Market?", *Applied Financial Economics Letters*, 1, 5, pp. 263-68.

## 4 THE EURO AREA BANKING SECTOR

Information that has become available since the June 2005 FSR confirms that euro area banks' profitability improved further, continuing the positive trend that began in 2003. Profitability also improved among those banking sectors that had previously reported weaker results, as well as in many Member States where economic growth rates were less favourable. However, although improved financial results may have made banks more resilient to vulnerability, in the near term, downside risks remain in the medium to long term which originate from sources both internal and external to the banking sector.

### 4.1 FINANCIAL CONDITIONS IN THE BANKING SECTOR

#### BANKS' PROFITABILITY IMPROVED ACROSS THE BOARD

Consolidated data<sup>1</sup> for 2004 show that the profitability of euro area banks improved further (see Chart 4.1), consolidating the recovery that began in the previous year. Behind the strengthening of banks' profitability, reductions in the flow of provisions and growth in lending to households – mostly for housing purposes – continued to feature prominently.

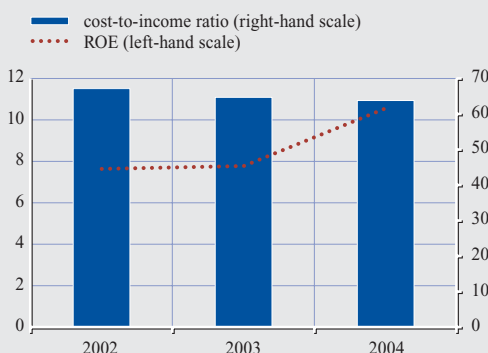
ROE for euro area domestic banks, the main indicator signalling increased profitability, stood at 10.54% at end-2004, increasing by almost three percentage points from 2003 (see Table S5). The developments in return on assets (ROA) closely followed those for ROE. In addition to the increase in average profitability, the distribution of ROE for euro area banks shifted to the right (see Chart 4.2). This indicates that both tails of the distribution (i.e. the worst and best performing banks) were more profitable in 2004 than 2003. The ROE of foreign banks, which includes both euro area and non-euro area-owned foreign banks, stood at 10.46% at end-2004.<sup>2</sup>

Available data for the first half of 2005 for a set of large euro area banks indicate that the trend observed in the 2004 consolidated banking data continued into 2005 (see Box 10 and Table S9). It is important to note, however, that apart from a difference in the sample between the consolidated banking data and the data used in Box 10, any direct comparison between

- 1 See ECB (2005), *EU Banking Sector Stability*, October, Statistical Annex, Box 1 for a description of the consolidated banking data.
- 2 See Special Feature D in this Review, "What determines euro area bank profitability", for an examination of the empirical importance of various factors on euro area banks' financial performance over a longer period of time.

**Chart 4.1 Profitability and cost-to-income ratios of euro area banks**

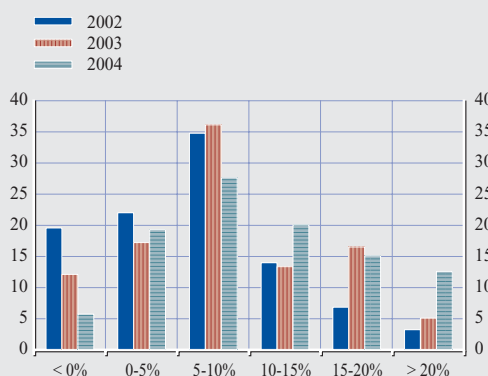
(2002 - 2004, %)



Source: Banking Supervision Committee.

**Chart 4.2 Frequency distribution of the return on equity for euro area banks**

(2002 - 2004, after tax and extraordinary items, % of total assets)



Source: Banking Supervision Committee.

## Box 10

**FINANCIAL CONDITIONS OF LARGE EURO AREA BANKS**

Problems in individual large euro area financial institutions could potentially spill over to other parts of the euro area financial system. For this reason, it is particularly important to monitor closely developments in these institutions. This Box complements the analysis in the main text by reviewing the recent financial results of a sample of large euro area banks. Because of the varying dates of implementation of IFRS by European banks, some of the set of euro area banks used in previous editions of this Review have begun to compile their financial statements under IFRS, whereas others have continued reporting under local or US GAAP (Generally Accepted Accounting Principles). During the implementation period, this complicates to some extent the analysis of financial statements from a financial stability perspective, given that IFRS and non-IFRS accounts are not directly comparable. Consequently, in order to ensure a consistent analysis, the large banks are analysed in two sub-groups depending on whether they reported their 2005 accounts under IFRS or non-IFRS.<sup>1</sup>

**IFRS-reporting banks**

As only a limited amount of historical data exists for comparison, any inferences on performance must be treated with a high degree of caution because the restated accounts for end-2004 or mid-2005 are not audited, and because institutions vary considerably in the degree to which they have implemented the accounting standards IAS 32, IAS 39 and IFRS 4 in their pro forma 2004 figures. Furthermore, given that 2005 is viewed by banks and rating agencies as a transitional year for accounting purposes, there is uncertainty about the extent to which the development of banks' financial results reflects either underlying circumstances or accounting changes. For example, profitability, provisions, and the overall size of banks balance sheets may be affected. The full impact will probably only become evident in 2006. In the short term, there may be important country-specific effects related to IFRS implementation that may affect the interpretation of the results.

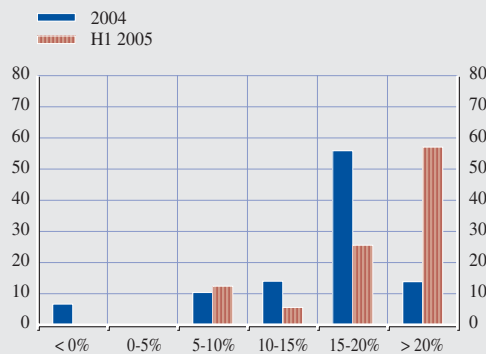
Profitability for the largest euro area banks reporting under International Accounting Standards (IAS), as measured by the weighted average ROE, increased from 13.6% in 2004 to 20.8% in the first six months of 2005 (see Chart B10.1). While it is difficult to assess the degree to which the change in accounting standards affected this performance, this does suggest that the underlying performance of most large euro area banks has remained solid. In fact, all of the institutions in the sample reporting results for the period up to the end of June 2005 posted an increase in ROE.

For banks reporting under IFRS, net interest income fell from 1.55% of total assets in 2004 to 0.93% at the end of Q2 2005. As with those banks that did not report financial results under IFRS, this reflected increased competition as well as the need to fund new loan growth from more expensive sources. By contrast, non-interest income such as fee and commission income rose for most institutions in the first half of 2005.

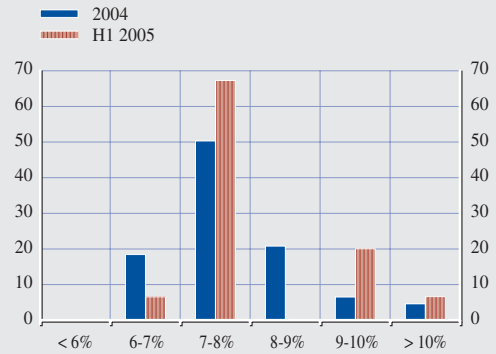
Provisions declined from 0.16% of total assets at the end of 2004 to just over half that figure at 0.08% of total assets at the end of H1 2005. Costs also declined, with the weighted average

<sup>1</sup> For a detailed overview of IFRS, see Special Feature E in this Review entitled "Main effects from the new accounting framework on banks".

**Chart B10.1 Frequency distribution of return on equity for large euro area banks (IFRS)**



**Chart B10.2 Frequency distribution of Tier 1 ratio for large euro area banks (IFRS)**



Sources: Published accounts of individual banks and ECB calculations.  
 Note: Data for the first half of (H1) 2005 are annualised and unaudited and are based on 14 banks from a sample of 15.

cost-to-income ratio falling from 63.52% in 2004 to 61.44% in June 2005. The cost-to-income ratio not only decreased in the best performing group of institutions (first quartile for the cost-to-income indicator), but also for those performing worse than the weighted average (the third quartile), perhaps signifying that cost control has been firmly established.

Increased profitability has also led to the continued strengthening of capital ratios. The Tier 1 ratio increased over the period, rising from 7.53% in 2004 to 8.24% in 2005, marking an increase in the buffers available to banks to cushion against unexpected losses (see Chart B10.2). The overall regulatory solvency ratio also increased over the period from 11.36% in 2004 to 11.92% at the end of the second quarter of 2005.

### Non-IFRS-reporting banks

On the whole, the financial positions of large euro area banks not reporting under IFRS continued to improve in the first half of 2005, consolidating the performance of the previous two years. This was mainly driven by reasonable performance from non-interest income sources, and benefited from the reduction in charges for credit losses. However, generating sustainable revenue in some domestic markets remains challenging for certain institutions. Profitability, as measured by the weighted average ROE, continued to improve from about 4.5% in 2004 to just over 15.3% in Q2 2005 (see Chart B10.3). Furthermore, the weaker institutions also managed to improve their performance, with banks in the bottom quartile of the distribution increasing profitability from -2.15% in 2004 to 14.50% in the first six months of 2005.

Banks' net interest income as a percentage of total assets continued to fall, dropping from a weighted average of 0.61% for 2004 as a whole to 0.55% in the first half of 2005. The continued effect of low nominal interest rates, increased competition in certain retail segments, and low loan demand in some of these banks' domestic markets has led to sustained pressure on margins. Most institutions also reported increased non-interest income, especially fee and commission income.

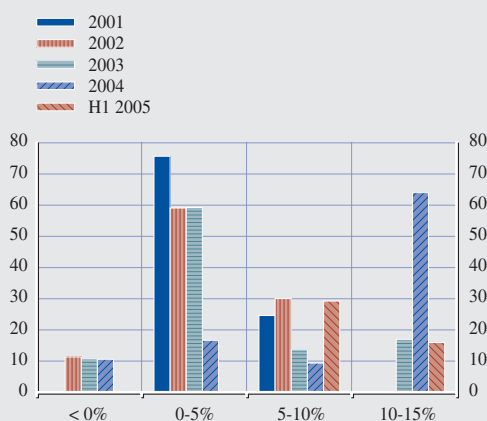
Improved credit risk conditions led to a moderate decline in provisions from a weighted average of 0.09% of total assets in 2004 to 0.08% of total assets at the end of Q2 2005. This

level of provisioning is particularly low compared to historical norms. While some individual institutions have indicated that provisions may increase slightly during the second half of the year, it cannot be ruled out that the adequacy of some banks' provisioning could be tested if credit conditions were to deteriorate unexpectedly.

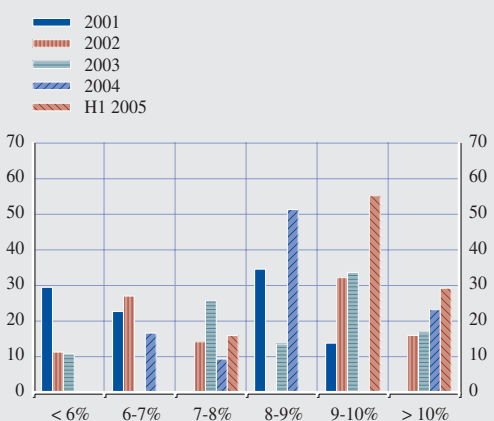
Cost control measures continued to be implemented by most banks in the first half of 2005 in order to sustain profitability. The weighted average cost-to-income ratio decreased from 75.05% in 2004 to 71.93% in the first half of 2005. The weighted average Tier 1 ratio increased from 8.06% in 2004 to 8.28% during the first half of 2005, with the weakest performing institutions also managing to increase their Tier 1 ratios (see Chart B10.4). Overall solvency ratios improved as well (see Table S9).

A notable development was that most indicators of financial conditions for both sets of banks improved regardless of the accounting method followed. If this trend continues for the remainder of 2005, the resilience of euro area banks to adverse shocks should improve further. However, for some institutions without strong underlying performance in their most important markets, it remains to be seen how durable the current return to profitability will be, given the reliance of these institutions on certain types of non-interest income sources, in tandem with cost-cutting to boost overall profitability.

**Chart B10.3** Frequency distribution of return on equity for large euro area banks (non-IFRS)



**Chart B10.4** Frequency distribution of Tier 1 ratio for large euro area banks (non-IFRS)



Sources: Published accounts of individual banks and ECB calculations.  
Note: Data for the first half of (H1) 2005 are annualised and unaudited and are based on three banks from a sample of six.

results for euro area banks in 2004 and 2005 is further complicated by the application of new reporting requirements in 2005, following the adoption of International Financial Reporting Standards (IFRS).

#### OPERATING INCOME FELL MARGINALLY

According to the consolidated banking data, the total income of euro area banks fell

marginally, as a percentage of total assets, between 2003 and 2004, while net interest income decreased slightly as a share of total income (see Table S5).

Turning to the main sources of banks' income, the low interest rate environment supported a rise in lending to households for housing purposes at an annual rate of 7.9% in December

2004, a rate similar to what was experienced in 2003 on the basis of MFI data. This growth rate further accelerated to 10.2%, on an annual basis, according to preliminary data for the first six months of 2005.

There is also some evidence of a new lending pattern developing for euro area banks concerning lending to non-financial corporates, especially the smaller ones. Borrowing by non-financial corporates was sluggish in 2002 and 2003, but started to pick up in 2004 and early 2005. Consequently, loans from euro area MFIs became an increasingly important source of funds for non-financial corporates in 2004. The rate of corporate borrowing growth and the share of MFI lending in it is, however, still far from the peaks recorded in the period 1999-2000.

Nonetheless, if prolonged, the increase in corporate borrowing could provide banks with a desirable differentiation in sources of income. In fact, in the persistently low interest rate environment of the last few years, banks have probably faced constraints in supporting their operating income in mature markets, which may have led them to increase their exposures to potentially more risky assets or geographical regions. In this light, a recovery in borrowing from the corporate sector would be beneficial. This development could also reduce banks' dependence on lending to households for housing purposes, especially for banks in those countries where house prices have increased substantially over the last few years.

Notwithstanding the potential recovery in borrowing by corporates, evidence of a sustained improvement in this source of income for banks is still elusive. Corporates appear reluctant to increase their borrowing for long periods of time. The largest part of the increase in borrowing volumes is for maturities of no more than five years, irrespective of the potential benefits of locking in generally low interest rates at present (see Chart S54).

The aggregated figures for domestic banks in the consolidated banking data show that there was a very small decline in lending in banks' balance sheets as a share of total assets in the euro area (see Table S6). Part of this fall is related to the more rapid increase in euro area banks' assets. The group of large banks recorded the most noteworthy reduction in loans as a share of total assets. It cannot be excluded that the development in lending by large banks may indicate a broad-based containment of lending by banks, in relation to their accumulation of total assets.

Apart from the developments in terms of lending volumes, information on loan pricing shows that lending margins, based on MFI data, fluctuated rather sharply in the first half of 2004 before stabilising in the second half of 2004 and into the first half of 2005 (see Chart S57). Banks appear to be experiencing strong competition in their lending activities, especially to households, and thus face significant constraints in increasing their lending margins (see also Box 11). Therefore, the tentative increase in margins may overestimate the potential for increased interest income for euro area banks going forward.

Deposit margins have evolved less positively. As banks have increased their lending, they have had to compete for depositors' funds; however, with the household sector increasingly burdened by housing debt, deposits may not have been widely available to banks. The declining margins for most of 2004 and the first half of 2005 indicate that euro area MFIs were faced with a scarcity of funding from deposits (see Chart S58). The information from banks' balance sheets points in the same direction: as a share of total assets, deposits remained basically unchanged in the euro area (see Table S6).

The gradual flattening of yield curves in the euro area could impair banks' efforts to improve their net interest income going forward. A flatter yield curve reduces the revenues that banks derive from traditional maturity transformation business. Apart from

lower revenues, the continuing increase in lending by banks, as also indicated by the sustained demand for consumer and housing loans and the increasing demand for corporate loans in the latest euro area Bank Lending Survey (October 2005, see Box 11), coupled with strong competition among banks, could negatively affect the quality of banks' loan portfolios.

Net non-interest income as a share of total assets remained broadly unchanged (see Table S5). Among the components of non-interest income, fees and commissions increased in

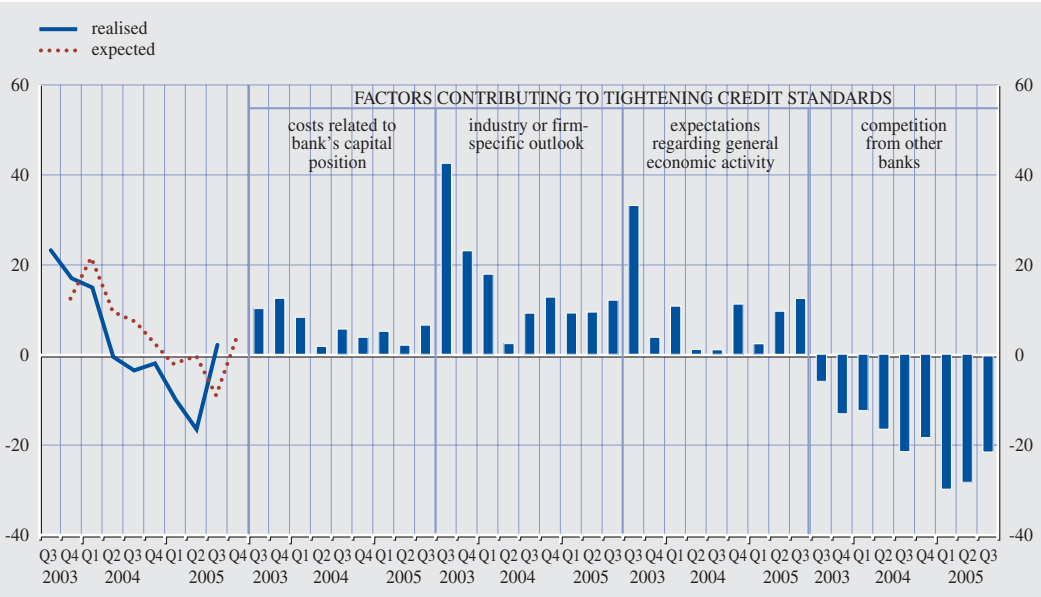
2004 both in terms of total assets and of total income, and made a positive contribution to the net non-interest income of euro area banks. By contrast, profits from securities and foreign exchange trading (henceforth "trading and forex results"), fell for all bank groups in the euro area, both as a share of total assets and total income. While fees and commissions may also be earned by banks on their more traditional lending activities, trading and forex results are more directly correlated with securities market conditions, where the low volatility environment may provide limited opportunities for trading activity.

Box 11

ASSESSING FINANCIAL STABILITY IMPLICATIONS OF RECENT FINDINGS FROM THE ECB BANK LENDING SURVEY

The ECB's Bank Lending Survey (BLS) provides timely qualitative evidence of the lending policies of the euro area banking sector, and should be a useful tool for detecting turning points in the credit cycle and potential credit crunches facing euro area households and firms. This Box examines recent developments in banks' credit standards – and the underlying determinants – on the approval of loans to households and loans since early 2005, as reported in the October 2005 BLS.

Chart B11.1 Changes in credit standards applied to the approval of loans or credit lines to enterprises



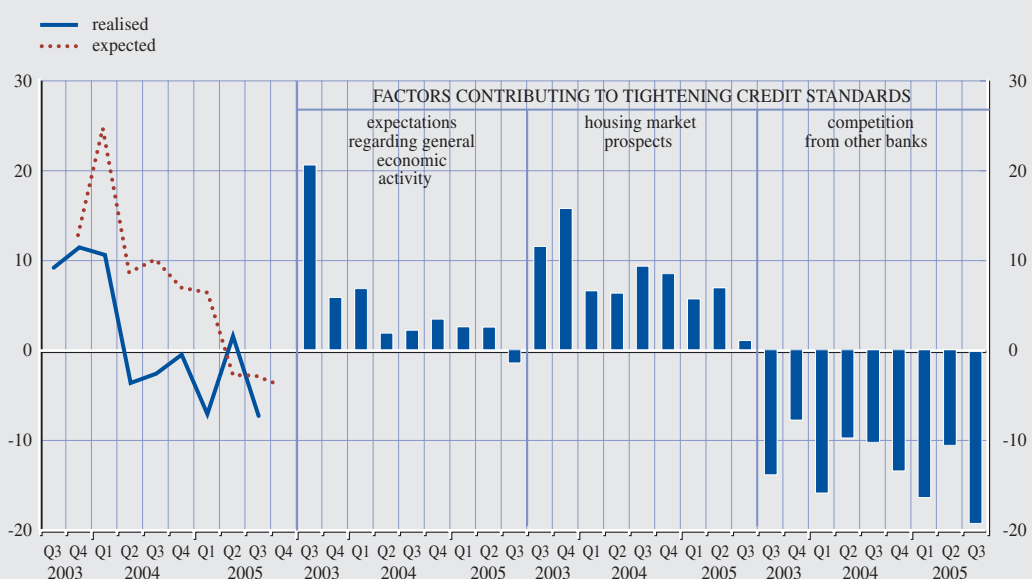
Source: ECB Bank Lending Survey.



According to the BLS, in the third quarter of 2005 banks reported more or less unchanged (compared with the previous quarter) credit standards on the approval of loans to enterprises. The slight net tightening (+2%) in the third quarter of 2005 occurred following five consecutive quarters of net easing of credit standards towards the non-financial corporate sector. While it is still too early to tell whether this change constitutes a turnaround in the easing cycle of credit standards on corporate loans, it may partly reflect a strong increase in perceived loan demand (as reported in the October 2005 BLS), enabling banks to attract borrowers without having to ease credit standards. Broadly unchanged underlying factors (such as the industry or firm-specific outlook, and expectations regarding general economic activity) compared with the previous quarter contributed to ending the net easing of credit standards (see Chart B11.1). The increase in corporate loan demand may also have mitigated the effects of competition from other banks on credit standards applied to loans. With regard to the terms and conditions by which credit standards were applied, banks reported that margins on average loans were lowered (although less than in previous quarters), while non-interest rate charges and margins on riskier loans tended to support a net tightening of credit standards, suggesting that banks were becoming more discriminating in their pricing of risks.

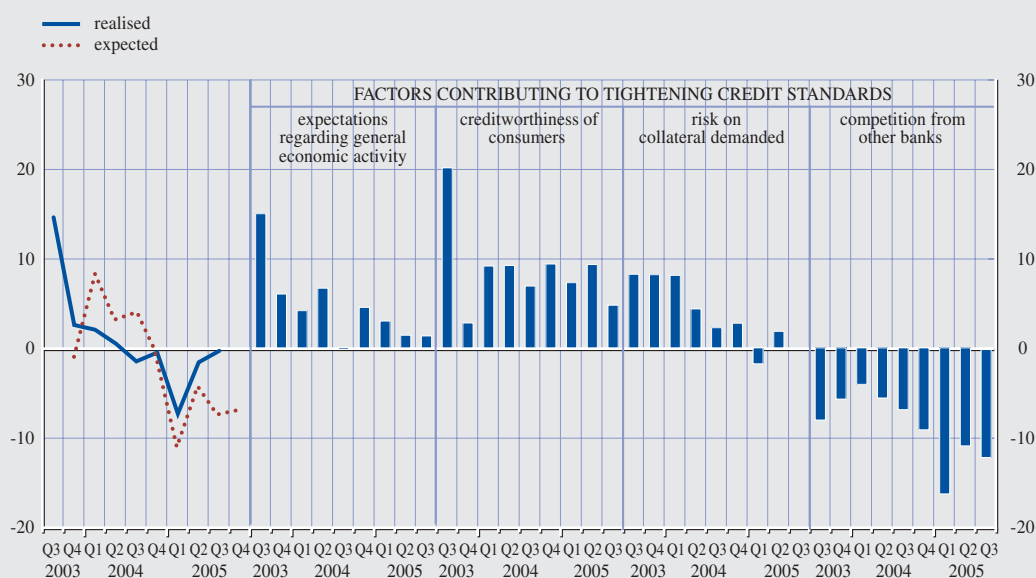
With regard to the approval of loans to households for house purchase, banks reported a net easing of credit standards in the third quarter of 2005. This was in line with developments in previous quarters, except for the second quarter of 2005 when a slight net tightening was reported. The net easing seemed to reflect, in particular, reduced concerns regarding housing market prospects as well as a slight improvement in expectations concerning general economic activity (see Chart B11.2). Moreover, competition from other banks continued to contribute to the net easing of credit standards. The tightening of credit standards on loans for house purchase was mainly carried out through the margin on riskier loans, while margins on average loans as well as less stringent loan-to-value ratios contributed to the net easing.

**Chart B11.2 Changes in credit standards applied to the approval of loans or credit lines to households for house purchase**



Source: ECB Bank Lending Survey.

Chart B11.3 Changes in credit standards applied to the approval of loans or credit lines for consumer credit and other loans to households



Source: ECB Bank Lending Survey.

In the third quarter of 2005, euro area banks reported broadly unchanged credit standards on the approval of loans for consumer credit and other loans to households, following four quarters of net easing (see Chart B11.3). The factors behind the applied credit standards were more or less unchanged from the previous quarter, with competition from other banks (and from non-banks) contributing to a net easing, while factors such as borrowers' creditworthiness, the risk of collateral demanded and expectations of the general economic activity continued to pull towards a net tightening. With regard to terms and conditions, the net easing of credit standards on consumer credit and other loans to households was carried out, in particular, through lower margins on average loans; margins on riskier loans were not eased, however.

Overall, as in previous quarters, in the second and third quarters of 2005 euro area banks largely continued to ease or to keep credit standards on loans to the non-financial private sector broadly unchanged. The net easing was mainly driven by strong competition from other banks, but took place against a background of deteriorating expectations regarding economic activity. This suggests that banks may have taken on more risk in order to gain market share and boost profitability. In the most recent quarter, however, there are some signs that banks have reacted to the still moderate economic growth prospects and increasing loan demand by ending the net easing of credit standards. Moreover, the perceived increase in risk-taking in recent quarters seems to have been reflected in more differentiated pricing of loans. All in all, the question whether these developments could entail future difficulties, such as a deterioration in the quality of banks' credit portfolios, depends on the extent to which the accumulated risks materialise in the period ahead.

### **COST EFFICIENCY IMPROVED**

Cost containment, which contributed positively to banks' profitability in 2002 and 2003, continued at a slower pace in 2004 (see Chart 4.1). Nevertheless, total costs, as a share of total assets, still declined for all bank categories (see Table S5).

Developments varied among the components of total costs. For example, the share of staff costs declined only marginally, and this left banks relying on administrative and other costs to reduce their total costs. This may imply limited scope for future cost-efficiency gains. As banks in the euro area have relied rather heavily on cost-cutting to support profitability over the last few years, the exhaustion of this source of profitability may exert pressure on results in the future.

### **PROVISION FLOWS DECLINED FURTHER, BUT THE COVERAGE RATIO INCREASED**

General economic conditions in the euro area have supported banks' activities: insolvencies in the household and corporate sectors declined further, any deterioration in banks' asset quality was marginal, loan losses declined, and significant write-offs or write-downs of credit overdue in the previous years in at least a few Member States reduced the impact of credit risk on the banks' balance sheets. Against the background of such a benign credit environment, the aggregate flow of provisions declined further, and as a share of total assets the stock of provisions also fell between 2003 and 2004 (see Table S5 for the flow of provisions and Table S7 for the stock). Developments varied across countries, however, as in at least one large country the level of provisions fell as a normalisation in the aftermath of the high provisioning activity observed in 2002, when insolvency figures had risen sharply.

An additional factor expected to affect the flow of provisions in 2005 is the move of stock market-listed banks (and, in some countries, all banks) to IFRS.<sup>3</sup> While it is still premature to make a precise assessment of the impact of the level of provisions, not least because the

impact is likely to differ across the euro area depending on the accounting regime adopted until 2004, two broad indications can nevertheless already be provided: (1) provisioning requirements under IFRS may be more restrictive, as IFRS require objective evidence of impairment that is supported by cash flows before an impairment provision can be created; and (2) the 'Funds for General Banking Risks', or general provisions, no longer exist. Given that the credit cycle is at a potentially delicate juncture, the impact of these accounting changes on provisions calls for careful monitoring in 2005 to ensure that capital buffers remain at a prudent level.

Indeed, beyond the short-term horizon, the overall low levels of provisions could be questioned. While the low level may be justified at present by the benign credit risk environment, a less benign environment would make the situation more difficult for banks. Possible triggers for a deterioration include a rise in short and long-term interest rates, or a sudden worsening in the macroeconomic environment. In at least a few Member States, there is a perception that credit quality, particularly in the household sector, could weaken over the medium term, and it cannot be excluded that the ability of the present stock of provisions to provide a sufficient buffer may be tested.<sup>4</sup>

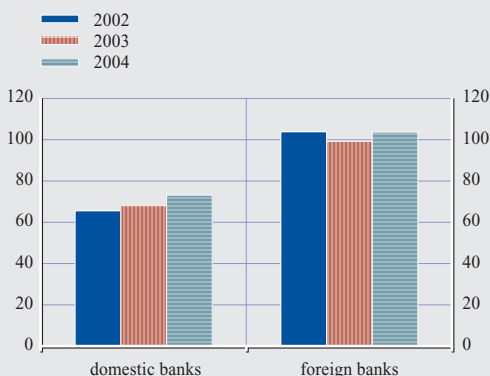
In contrast to the observed changes in provisioning as a share of total assets, changes in asset quality and the coverage ratio, i.e. the ratio of provisioning stocks over total non-performing and doubtful assets, paint a more positive picture (see Chart 4.3). For the group of domestic banks, the share of non-performing and doubtful assets as a percentage of own funds, gross and net of provisioning, decreased

3 See Special Feature E, "Main effects of the new accounting framework on banks", in this Review for a more thorough assessment of the implications of the new accounting standards.

4 In most euro area countries, banks are in general not allowed to provision in anticipation of the credit cycle, and provisioning levels are mostly based on historical asset impairment. Nonetheless, recent low levels of provisions have reduced banks' buffers in the event of a downturn in the credit cycle.

Chart 4.3 Euro area banks' total provisions

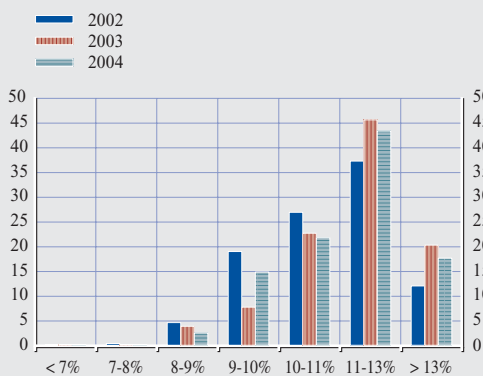
(2002 - 2004, % of non-performing and doubtful assets)



Source: Banking Supervision Committee.

Chart 4.4 Frequency distribution of overall solvency ratios for euro area banks

(2002 - 2004, % of risk-weighted assets)



Source: Banking Supervision Committee.

between 2003 and 2004. The largest reduction was in gross terms (see Table S7).

The positive developments in coverage ratios among most groups of banks should be considered with caution, as the picture of the quality of the assets portfolio of banks is backward-looking and is in general highly sensitive to changes in the phase of the credit cycle. A sudden deterioration in credit quality would cause a drop in coverage ratios. Due to the possibility, albeit remote, of such circumstances, the absolute amount of the flow and the stock of provisions would be the more meaningful indicator.

#### SOLVENCY BROADLY UNCHANGED

Banks' capital adequacy in the euro area remained broadly unchanged in 2004, as the overall solvency ratio slightly fell and the Tier 1 ratio remained broadly constant (see Table S8). These developments are broadly consistent with the indicators for large banks based on published accounting data for the first half of 2005 (see Box 10). Large banks have a substantial impact on the aggregate indicators, and therefore the share of the total banking sector with an overall solvency ratio of less than 9% increased.

Looking at the information that is collected at country rather than bank level, the dispersion in the overall solvency ratio increased in 2004. This would suggest that, together with the downward shift in the average level, some pockets of fragility may be developing, although it must be borne in mind that solvency figures remain comfortably above the regulatory minimums (see Chart 4.4).

The share of risk-weighted assets of total risk-adjusted assets declined for the group of domestic banks (see Table S8), owing to a reduction in risk-adjusted trading book assets. On the other hand, risk-adjusted off-balance sheet assets increased (see Table S8).

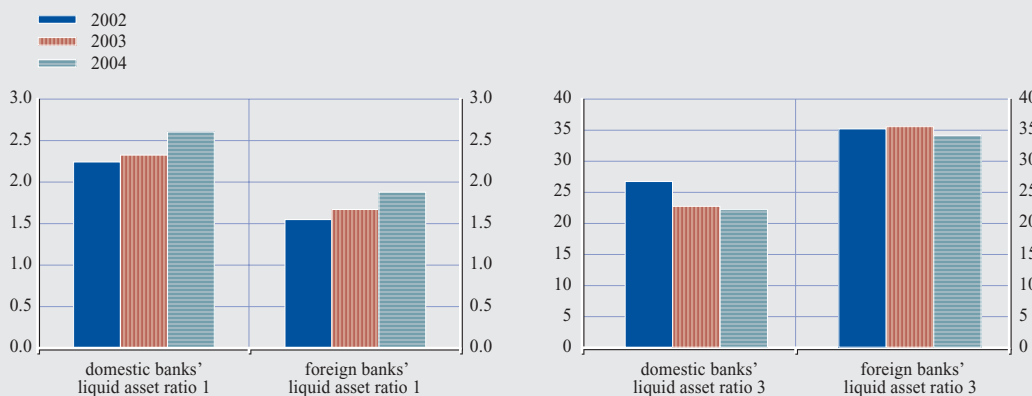
#### LIQUIDITY DEVELOPMENTS MIXED

Developments in euro area banks' liquidity were mixed in 2004. On the assets side, liquidity increased on the basis of the indicator covering assets with the lowest maturity, while it declined in relation to the broadest liquidity measure, which includes assets with longer maturities (see Table S6 and Chart 4.5).<sup>5</sup>

5 The narrowest liquidity indicator, Liquidity asset ratio 1 in the tables, covers only cash and short-term government debt, as a share of total assets; the intermediate indicator, Liquidity asset ratio 2, also includes loans to credit institutions; and the wider liquidity indicator, Liquidity asset ratio 3, includes in addition also longer-term debt securities issued by public bodies.

**Chart 4.5 Euro area banks' liquid asset ratios**

(2002 – 2004, % of total assets)



Source: Banking Supervision Committee.

Note: Liquid asset ratio 1 includes cash and short-term government debt, while Ratio 3 in addition includes loans to credit institutions and debt securities issued by public bodies.

Against this background, the expectation of an upward shift in long-term interest rates may have encouraged banks to keep most of their funds in assets with the shortest maturities, such as cash and government debt.

On the liabilities side, banks decreased their reliance on the interbank market, as the amounts owed to credit institutions as a share of total assets fell (see Table S6). Banks partly compensated for this by stepping up the use of market instruments such as debt certificates and subordinated liabilities. The mix of increased market funding and decreased deposits in some euro area Member States could indicate a tightening in the price of liquidity of banks in those countries. Given that market funding is more expensive for banks, such developments may have a negative impact on banks' profitability in the near future.

#### 4.2 RISKS FACING THE BANKING SECTOR

Following the review of the financial conditions of the euro area banking sector, this sub-section considers the risks facing the euro area banking sector in the period ahead. It should be emphasised that these risks are not highlighted with the aim of identifying the most probable outcome, but rather with

the intention of highlighting potential and plausible sources of downside risks with regard to the likeliest outcome.

Given the favourable developments in the financial performance of the euro area banking sector, including many of the weakest performing banks, the baseline assessment of the outlook for banks is broadly positive. This assessment is also supported by the fact that in many euro area countries, improved banking sector performance took place against a backdrop of subdued economic growth. Despite this rather benign overall assessment, certain vulnerabilities can be identified, some internal and others external. Box 12 reports on the results of the survey of the main risks going forward as identified by the banks themselves in spring 2005.

Starting with sources of risk and vulnerabilities internal to the banking sector, as discussed in sub-section 4.1, the improvement in banking sector profitability was supported by a substantial reduction in the number of corporate sector defaults and non-performing loans between 2002 and the first half of 2005, and a corresponding fall in provisioning for loan losses by banks in almost all countries. There are some signs, however, that the cuts in provisioning may have advanced rather far as, in

an increasing number of cases, banks have reported that provisions had reached all-time low levels. Going forward, the adequacy of low levels of provisioning will therefore rely on the viability of expectations that the credit quality of bank loan portfolios will continue to develop favourably, which in some countries could be questioned in the current phase of the credit cycle.

Although abating in intensity compared with previous years, banks' efforts to cut costs, as a share of total assets, continued to reflect tight competition and, in some countries, the difficulty of generating income from the core maturity transformation business in a low interest rate environment. Since provisioning and costs both have lower limits, in order to sustain profitability banks might come under increasing pressure to resort to non-interest income, thereby possibly taking on greater risk. Furthermore, as discussed elsewhere in this Review, the uncertainty surrounding the adoption of the new IFRS accounting standards may contain transitory risks to banks insofar as their practices of reporting provisioning need to be amended.

The principal sources of external risks and vulnerabilities in the operating environment of banks continued to be high oil prices and the persistence of wide global imbalances. High oil

prices, should these persist, could adversely affect the ability of non-financial sectors to honour their liabilities to banks. A disorderly unwinding of global imbalances could, if this were to materialise, result in heightened exchange rate and bond market volatility. While the direct exposures of euro area banks to the oil market and to foreign exchange risks seem rather limited, the risks posed by exchange rates could prove to be correlated with the credit risks of non-financial sectors – especially firms in the export sector and their suppliers such as SMEs.

The protracted period of low short-term interest rates and ample global liquidity has – via the global quest for yield – helped compress spreads across the credit spectrum to exceptionally low levels. The tightness of credit spreads could represent a greater than normal market risk for banks, and may also have affected their pricing of risks in the context of corporate lending.

To assess the possible impacts of these risks, this sub-section first provides an assessment of EU banks' credit risks originating from their lending to the household and corporate sectors. It then assesses the market risks from interest rate, exchange rate and other market exposures, as well as banks' exposures to emerging markets and hedge funds.

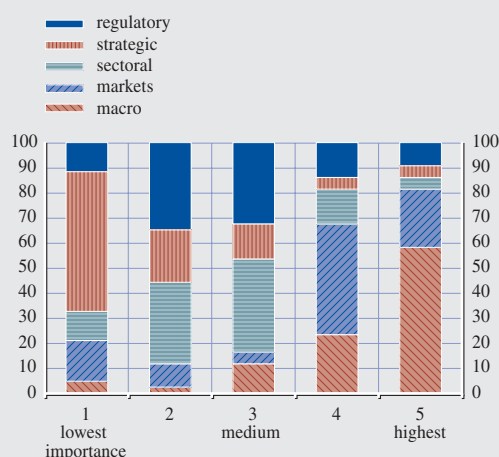
#### Box 12

##### SURVEY ON MAJOR EU BANKS' PERCEPTION OF RISKS IN THE YEAR AHEAD

This Box summarises the answers from a survey of banks' perceptions of main risks for the year ahead. The survey was undertaken by the Banking Supervision Committee, with the assistance of the Working Group on Developments in Banking (WGBD), in February and March 2005, covering all EU Member States. It was similar to the one held in 2004 (see ECB (2004), *Report on EU Banking Structures*, November). It was completed by 99 banks, 43 of which were from euro area Member States, and 56 from non-euro area Member States. A maximum of five banks per country participated in the survey. The respondent banks were asked to state what they perceived as major risks and to distinguish between macroeconomic, financial market, sectoral, strategic and regulatory risks. They were then asked to assign different scores to these five broad categories on a scale from 1 (very low) to 5 (most important), and to elaborate in more detail what they felt constituted those risks.

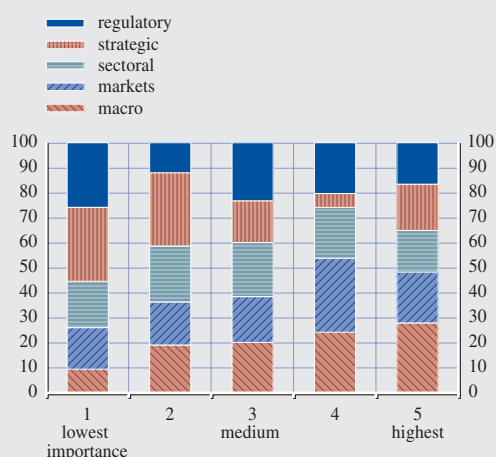
**Chart B12.1 Sources of risk for euro area banks**

(2005, % bank answers per score)



**Chart B12.2 Sources of risk for non-euro area banks**

(2005, % bank answers per score)



Sources: Banking Supervision Committee and ECB calculations.  
Note: Data not available for Irish banks.

Charts B12.1 and B12.2 present the distribution of the banks' scores on the different broad risks, each as a percentage of the replies rated 1 to 5, with a further disaggregation between the euro area and non-euro area. A higher percentage of replies with score 5 for a specific risk, for example, indicates that relatively more banks see this risk as a very important one. It should be noted that the risks reported here are directly attributable to the respondent banks, and do not necessarily reflect the ranking of risks by supervisory authorities or central banks (as reflected elsewhere in this Review).

The results clearly indicate that, similar to last year, euro area banks regard macroeconomic risks as the major challenge in the period under review (i.e. until Q1 2006), followed by possible risks stemming from the financial markets. For non-euro area banks, the balance of risks is more evenly spread across different sources of risk. This possibly reflects relatively more favourable macroeconomic and financial market conditions in the latter countries, which allows banks to pay more attention to other sources of risk.

Further detail was gained by a decomposition of the broad sources of risk into specific items, for which banks were also asked to assess the "expected negative impact" on profits, ranging from less than one month to one quarter or a full year's profit. The discussion below focuses on euro area banks, although Table B12.1 also displays evidence for non-euro area banks, which presents a fairly similar picture. The table shows that 86% of the respondent euro area banks see downside credit risks stemming from a deterioration in borrower quality as a major challenge to profits, of which 61% regard this as having a potentially major impact on profits. Another major macro challenge for euro area banks is weak capital spending, which would reduce the lending volume to the corporate sector. On the other hand, banks do not consider lower consumer spending and borrowing to be a major issue. A possible house price bubble, however, does worry banks from almost all euro area countries. At the time of the survey, oil prices had not risen to the levels currently experienced, and banks regarded oil prices therefore

**Table B12.1 Respondent banks' main risks stemming from five broad classes of risk**

(2005, %)

	euro area banks					non-euro area banks				
	all	major	trend			all	major	trend		
			constant	upward	major/ upward			constant	upward	major/ upward
<b>Macroeconomic</b>										
Credit risk-deterioration										
borrower quality	86	61	73	24	35	68	41	47	29	26
Weak capital spending										
corporates	60	40	54	46	80	45	9	72	16	40
House price bubble	42	61	44	56	46	57	23	31	69	69
Sustained high or rising oil										
prices	30	31	23	77	80	32	9	33	61	80
Credit risk-overheating-										
high indebtedness	26	18	73	18	0	59	29	36	61	69
Global imbalances	23	50	20	80	100	16	2	67	33	0
<b>Financial markets</b>										
Major downturn of										
equity market	67	36	79	3	0	38	7	71	24	50
Decrease in interest rates	49	40	38	14	0	59	29	33	58	50
Increase in interest rates	40	78	41	59	50	57	25	34	59	57
Exchange rate developments	37	27	63	31	43	54	13	53	33	14
Credit event	35	29	60	33	38	39	14	73	14	0
Flattening of the yield curve	33	69	71	0	0	36	20	35	55	55
<b>Sectoral</b>										
Competitive pressure/ overcapacity	88	41	42	55	39	96	55	15	83	90
Emergence of new players	63	20	37	44	36	63	25	43	46	57
M&A and consolidation, need for size	47	25	30	65	67	50	11	43	50	67
<b>Strategic</b>										
Need to increase										
performance/efficiency	77	45	39	55	32	82	45	24	70	72
Expansion in new markets	40	41	41	59	100	34	7	42	58	50
Need to increase size	37	19	69	31	10	43	18	46	50	50
Operational risks	37	25	63	31	43	32	13	50	39	29
Risks from financial										
innovations	35	13	20	80	50	34	7	37	58	75
<b>Regulatory</b>										
International accounting										
standards	93	40	20	70	88	70	30	26	67	76
Basel II	72	42	29	71	56	86	29	19	77	81
Corporate governance or										
reporting burden	49	24	5	95	100	36	7	25	75	75
New EU Directives	44	50	21	79	80	46	18	31	62	70
Increasing importance of										
rating agencies	33	36	36	64	100	20	4	36	64	100

Sources: Banking Supervision Committee and ECB calculations.

Note: "All" refers to the number of respondents mentioning a certain issue (as a % of the number of respondents). "Major" denotes the % of banks that identified the issue as having a major impact on profits (equal to quarterly profit or more). "Trend" compares the importance of the issue with one year ago, and gives the percentage of banks that identified a constant or upward movement in its importance. "Major/upward trend" refers to the % of banks that identified the issue as having a potentially major impact on profits and more important than one year ago (as a % of banks that expected a major impact).



as having a more remote and indirect impact on their profits, although the trend has been rising compared with 2004.

As for financial markets, around two-thirds of euro area banks factored in a possible downturn in equity markets later on in 2005. However, this seems to be a matter of normal caution, since in about 80% of the cases the issue has not become more pronounced compared with one year ago. Interest rate changes were a matter of concern for most euro area banks, although the direction in which banks expected these to influence their performance proved to be quite varied. Some banks expected to be mainly affected by rising rates, others by falling rates, and still others were concerned by a flattening of the yield curve or increases in interest rate volatility.

In the category of industry sector risks, almost 90% of euro area banks said they had been affected by tighter competitive conditions, which has been reflected in margin pressure in both deposit-taking and lending. In addition, around 60% of the surveyed banks were expecting competition from new market players (e.g. in consumer finance) to increase.

Although performance improved in 2004, many banks seemingly still see a need to take further measures to improve their situation. Otherwise, most banks seem to be relatively confident about their strategic choices.

Finally, in line with some other banking industry surveys, the results showed that for most banks the importance of regulatory and accounting issues has increased substantially compared with one year ago. Around 70% of euro area banks regarded the new regulatory framework (Basel II) as a challenge, while more than 90% mentioned that they expected to notice the effects of the new accounting standards.

## **THE OUTLOOK FOR CREDIT RISK IS FAVOURABLE BUT DOWNSIDE RISKS EXIST**

### **Banks' exposure to the household sector continues to increase**

A significant share of the lending portfolios of euro area banks is composed of loans extended to households, with non-consolidated data suggesting that lending to households represents roughly 36% of the total lending stock in the euro area. Against the background that lending to the household sector has, for several years, been the most rapidly growing line of business for banks, continued growth in exposures to the household sector counts as a potentially increasing source of credit risk, despite the generally higher quality of credit granted to households relative to the corporate sector.

Reflecting favourable financing conditions, households continued to accumulate more debt in the first half of 2005. As household debt ratios rise, the vulnerability of households to any negative income or interest rate shocks should also increase.<sup>6</sup> All else being equal, this means that adverse disturbances could have a greater impact on the non-performing loan rates of banks than in the past.

Most of the rise in household indebtedness reflects strong mortgage financing growth. Owing to the importance of this revenue source for banks, developments in residential property prices have become an important factor in the

<sup>6</sup> See Special Feature C, "Assessing the financial vulnerability of euro area households using micro-level data", in this Review, which highlights some of the characteristics of indebted households in the euro area.

assessment of risks to banking sector stability, warranting close monitoring of the housing market.

Turning to banks' credit conditions, despite the rather substantial increase in loan-to-value (LTV) ratios in the flow of new mortgages in many euro area Member States, the average LTV ratios of the mortgage lending stock in the euro area are still rather conservative. This suggests that a fall in house prices, should this happen, would need to be fairly large before credit quality in the euro area is more seriously eroded. However, declining house prices are often associated with rising unemployment caused by a macroeconomic shock. In such a scenario, the risk of default would rise in tandem with the erosion of the value of collateral (the residential property), thereby reducing credit quality more directly.

Available information suggests that the current household sector financial buffers should help households to absorb reasonably large adverse macroeconomic shocks. The ratio of debt to financial assets stabilised in 2003 at around 30% (see Chart S35). Moreover, the estimated total debt servicing burden of the household sector (repayment of the principal, plus interest payments) has remained broadly stable since 2000, at around 12% of disposable income (see Chart S37).

However, the overall impact of a change in interest rates on households' debt sustainability will notably depend on country-specific features of mortgage contracts, in particular the interest rate variability regime of the outstanding loans. In particular, the impact on households could be more substantial in countries where variable rates are more common. Furthermore, new borrowers would be more sensitive to changes, as a greater proportion of them are indebted at variable rates, and as they have not yet amortised a high amount of their principal.

The mortgage lending market has in recent years been characterised by intensified

competition, to some degree spurred by the favourable risk-weighting of mortgage loans within the Basel II framework. As mentioned above, in most euro area countries there has been a general tendency over the last few years towards granting higher LTV ratios, with banks in an increasing number of countries offering loans up to 100% of the value of the house. Since this has often gone hand in hand with an extension of the loan maturity, up to 30-35 years in some countries, the typical monthly instalment rate has been kept broadly unchanged (usually granted up to 30% of the household's monthly income). While the monthly debt servicing burden has not increased dramatically, the likelihood that borrowers could struggle to meet payment difficulties over longer repayment periods with slower loan amortisation has become higher.

As the ECB Bank Lending Survey shows (see Box 11), banks in the euro area slightly tightened their credit standards in the second quarter of 2005 in response to growing perception of risk, particularly in terms of worsening housing market prospects. However, the banks had once more eased their credit standards by the following quarter, reversing the tightening on account of reduced concerns regarding housing market prospects, coupled with a slight improvement in expectations concerning general economic activity. Looking forward, it remains unclear whether banks will continue to ease their credit standards or whether they could engage in a reassessment of the housing market. Nonetheless, banks' risk management techniques have improved, allowing them to cope more effectively with complex instruments used to transfer credit risks to the secondary market. This could in part have contributed to a lower share of non-performing loans in total loans to households.

Regarding the developments in unsecured consumer credit, outstanding amounts continued to rise at a brisk pace in some countries, compared with more moderate overall picture. The growth rate of consumer

credit continued on a modest upward trend until July 2005, with the stock of consumer loans and other credit as a proportion of total household loans standing at 13.5%. Intense competition among banks has contributed to a slight net easing of banks' credit standards for consumer credit, although this has been recently mitigated by an increased perception of risk on demanded collateral and on consumer creditworthiness. Since households in financial distress tend to default on consumer credit before defaulting on mortgages, payment arrears are more likely to show up first in the former category of loans. However, there are currently no indications of a systemic increase in payment disturbances and worsening consumer credit quality in the euro area.

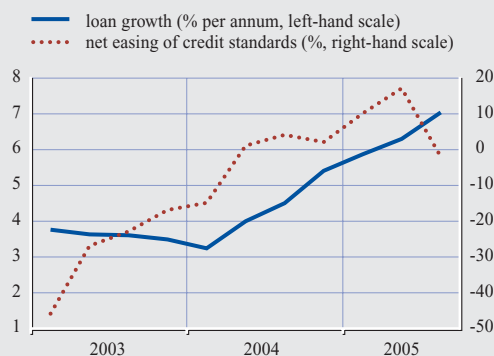
#### Corporate sector credit risks have eased

The information that has become available since the June 2005 FSR suggests that the quality of euro area banks' corporate loan portfolios may have started to improve. The main factors underlying this were the strength of corporate profitability coupled with favourable financing conditions. Banking sectors in most countries seem to have benefited from a benign credit environment, although marked differences across countries still continue to exist. In the foreseeable future, downside risks to corporate credit quality may arise from a slower than expected economic recovery in some Member States owing to weak domestic demand and persistently high oil prices, or from a possible turnaround in the credit cycle.

The possibility that sluggish corporate credit demand could hurt banks' profitability seems to have gradually eased in the euro area Member States. Supporting this assessment, bank lending to non-financial corporations picked up considerably in several countries between mid-2004 and mid-2005. The annual growth of short-term MFI loans to non-financial corporations has reached its highest rate since late 2001 (see Chart S30). Increasing financing needs for inventories, working capital and M&A activity as well as for

**Chart 4.6 Annual growth of euro area MFI loans to non-financial corporations and changes in credit standards**

(Q1 2003 - Q3 2005)



Sources: ECB and ECB Bank Lending Survey.

Note: The net percentages refer to the difference between the sum of percentages for "eased somewhat" and "eased considerably" and the sum of percentages for "tightened somewhat" and "tightened considerably".

leveraged buyout activity may have contributed to accelerating credit growth. To this end, syndicated lending activity in the euro area has increased, also reflecting significant growth in the leveraged segment of the market. According to market participants, the activity in syndicated lending is expected to evolve dynamically (see Box 13). On the other hand, weak fixed investment activity and the increased availability of internal funding sources owing to improved corporate profitability continued to have a dampening effect on corporate credit demand.

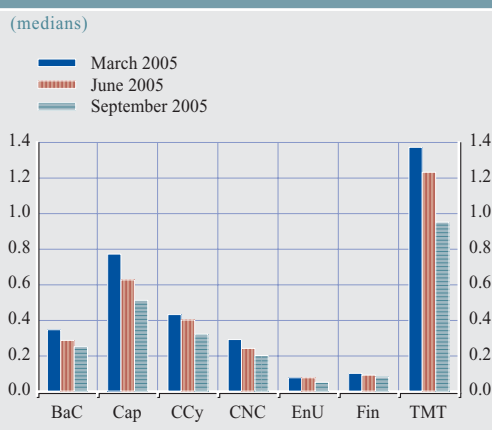
As evidence that supply-side factors might have also played a role in stronger loan growth, banks continued to ease their credit standards for loans to enterprises in the first half of 2005, and only slightly tightened their credit standards in the third quarter (see Chart 4.6). The October ECB Bank Lending Survey (see Box 11) indicates that for the banks in the euro area, the relaxation of credit standards has mainly reflected intensified competition, while it is probably too soon to tell whether the change in the third quarter constitutes a turnaround in the easing cycle. This change may in fact at least partly reflect a strong increase in perceived loan demand, which has

allowed banks to attract borrowers without having to ease credit standards. Additional information on the lending conditions to the corporate sector can be gathered from recent developments in the syndicated lending business. There, margins on leveraged loans might not be appropriately differentiating across the risk profile of EU borrowers, thus creating concerns about possible ongoing mispricing (see Box 13). In the event of slower than expected economic growth, it cannot be excluded that the loosening of credit standards, combined with the low level of provisioning in several countries, could leave some banks with a rather thin cushion against deteriorating credit quality, especially for those banks with lower than average profitability results.

Compared with the assessment in the June 2005 FSR, there are indications that risk perceptions of banks concerning SMEs might have started to improve in some countries. Country-level information suggests that the increase in the number of corporate insolvencies, which has been mainly driven by developments in the SME sector, may have slowed down in the euro area as a whole and even decreased in some countries in the first half of 2005. This positive development, however, should be treated with caution as in those countries where the number of insolvencies fell, the decline took place from historically high levels.

Banks in the euro area have reported that the recent easing of credit standards was also extended to SMEs, suggesting an increased willingness on the part of banks to lend to smaller companies. Notwithstanding the tentative evidence on the improved risk perception of banks concerning SMEs in some euro area countries, the loosening of credit standards might also have reflected a decrease in banks' risk aversion in an environment of narrow interest margins. Developments in the pricing of small loans by banks were mixed in the first eight months of 2005. While lending margins declined in the first couple of months of the year, they have since widened in the second quarter of 2005 to stabilise in July and

Chart 4.7 Expected default frequency for different euro area industrial sectors



Source: Moody's KMV.  
Note: The sectors are as follows: basic materials and construction (BaC), capital goods (Cap), consumer cyclicals (CCy), non-cyclicals (CNC), energy and utilities (EnU), financial (Fin), and technology and telecommunications (TMT).

August 2005 at levels recorded at the end of 2004 (see Chart S67). In sum, the development of margins suggests that banks' perception of SMEs' credit risk fluctuated throughout the first eight months of 2005.

Notwithstanding accelerating credit growth to non-financial corporations since mid-2004, euro area banks' aggregate exposures at risk are likely to have declined across most industries owing to a continued decline in the median EDFs (see Chart 4.7). Lending to those sub-sectors which are vulnerable to further increases in oil prices is, however, still perceived as relatively risky, and could result in higher credit losses for banks with sizeable exposures to these industries.

Regarding banks' exposure to the commercial real estate sector, significant differences continue to exist across euro area countries. On many occasions, loans related to the commercial real estate sector do not account for a significant part of the loan portfolio. On the other hand, experiences of those countries where banks have sizeable exposures have been diverse over the past year. In at least one large country, falling rents and commercial real

estate prices continue to pose risks for credits extended by banks to this sub-sector. In some countries, banks have reported that risk perceptions may have improved somewhat owing to a recovery in rental growth or relatively high pre-sale rates for offices.

Finally, developments in the market indicators of corporate credit risk have been mixed since the publication of the June 2005 FSR. After a tightening in early 2005, spreads on bonds issued by euro area non-financial corporations rose sharply in April and May, triggered by the

credit event affecting the US automobile manufacturers. Corporate bond spreads have moderated somewhat since then, but remain slightly higher than in early 2005. EDFs of large euro area firms continued to decline in the first three months of the year, although this improvement appears to have stopped in the second quarter. Overall, there are as yet no indications that the recent fluctuation in corporate bond spreads reflects a permanent worsening in perceptions of corporate credit risk on the part of market participants.

### Box 13

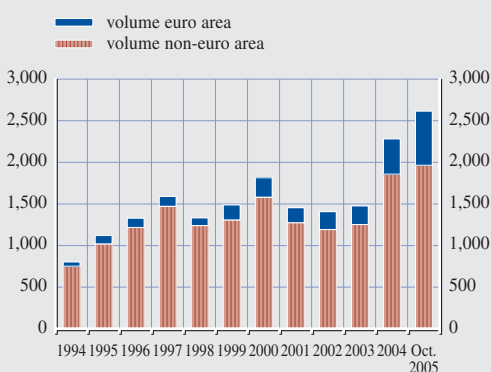
#### THE SYNDICATED LOAN MARKET IN THE EURO AREA MATURES INTO A DISTINCT ASSET CLASS

The global syndicated loan market has grown significantly over the last decade, with the total amount of gross issuance more than tripling between 1994 and 2004 (see Chart B13.1). The share of euro area borrowing rose from close to negligible levels just a few years earlier to reach 25% of global lending in 2005 (from January to October).

On the primary syndicated loan market – where loans are originated – loans can be broadly distinguished into investment-grade and leveraged according to the credit quality of the borrower. Spreads on investment-grade loans – which still account for the largest share of gross signings – are at record lows, reflecting high levels of liquidity and strong competition at this end of the rating scale (see Chart B13.2). Under these circumstances, conditions for borrowers have improved: maturities of extended loans have increased from 4.1 years in 1999 to over 6 years in 2004, and a less frequent use of covenants was reported. At the same time, the

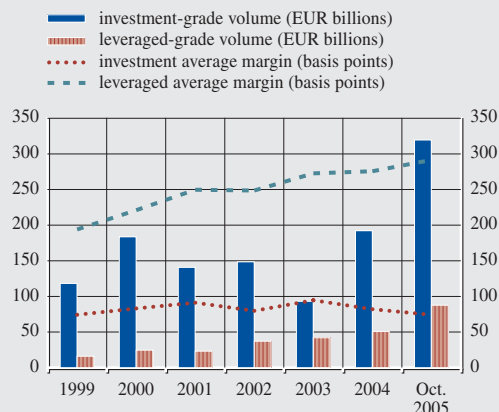
Chart B13.1 Annual volumes of syndicated loans

(USD billions)



Source: Dealogic (Loanware).

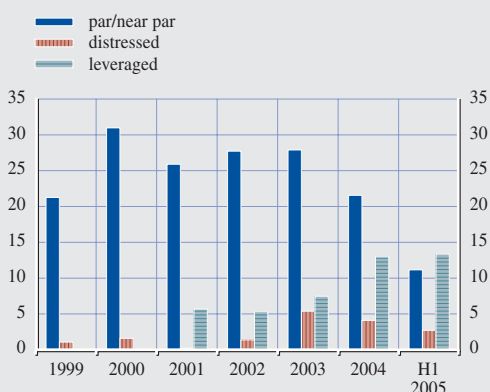
Chart B13.2 Euro area investment and leveraged grade volumes



Source: Dealogic (Loanware).

Chart B13.3 Secondary trading volume in Europe

(EUR billions)



Source: Loan Market Association.

combination of an erosion in pricing and the potential weakening of lenders' positions in the loan documentation have given rise to concerns regarding possible mispricing of credit risk.

As a result of the hunt for yield, the supply of capital for the leveraged loan segment has grown significantly, contributing to stronger competition in the primary market. Unlike in the investment-grade segment, the margins in the leveraged loan market have slightly increased (see Chart B13.2), although according to recent market views, the growing competition is exerting downward pressure, and pricing in the euro area may not reflect credit risk differentials, at least when

compared to similarly rated credit in the US. The broadening of the investor base in the leveraged loan market – which now includes insurance corporations, hedge funds and specialised CDO managers – has promoted product innovations which have in turn led to the emergence of new structured loan tranches with various levels of subordination, such as second lien loans<sup>1</sup> or payment-in-kind (PIK) instruments.<sup>2</sup>

The growth of the European secondary market, where syndicated loans are traded, reflects the broadening of the investor base, and was supported by more uniform market practices and standardised documentation produced by the Loan Market Association; however, at around 6% of the primary market, it remains still small. The secondary market is differentiated into par/near par, leveraged and distressed segments depending on the price to par at which the loan is traded. The secondary leveraged trading volume, non-existent at the launch of the euro, has since rapidly developed into the most important secondary market segment, accounting for about 50% of the trading in the first half of 2005 (see Chart B13.3).

Three recent developments in the leveraged loan market provide a further indication of the establishment of the syndicated loan market as a distinct asset class. Firstly, syndicated loans are increasingly assigned ratings by the rating agencies, and a new set of recovery ratings (estimating the likely recovery of the principal in the event of default) has been introduced. Secondly, the first index for leveraged loans that provides a benchmark against which investors can assess the performance of their investments was launched<sup>3</sup>, and is likely to enhance transparency and liquidity in the market still further. Thirdly, the arrival of CDS referencing European leveraged loans may attract additional investors as it will enable them to manage actively their exposure.

These developments, coupled with considerable growth in both the primary and the secondary market as well as significant changes in the product structure, have contributed to turn

1 Second lien loans are usually secured by a second-ranking charge on assets backing senior secured debt, and are typically subordinated in their rights to receive principal and interest payments from the borrower to the rights of the holders of senior secured debt.

2 PIK instruments pay interest in the form of additional loans (or bonds) instead of cash, thereby increasing the principal, and are classified as first-loss tranche but with preference in liquidation to equity securities.

3 In November 2004 Standard & Poor's launched the European Leveraged Loan Index (ELLI), tracking back to December 2002.

leveraged loans into a debt product that allows financial market participants to tailor their credit risk exposures. However, although these developments are indeed contributing to ensuring a better allocation of risks in financial markets, they may also give rise to concerns on financial stability grounds since, according to some market participants, credit risk may not be adequately reflected in the pricing, which is evident in the small or non-existent differences in prices for different layers of credit quality. At present, pricing is mainly driven by strong competition in the primary market and reflects to a lesser extent credit risk differentials. Pricing conditions that may currently appear to be appropriate could prove inadequate in the case of a turn in the credit cycle. A rise in global interest rates and an increase in market volatility, coupled with a significant increase in corporate sector leverage, may well contribute to such a turn. An improvement in the pricing of syndicated credits is however on the horizon. The recent launch of an official index for leveraged loans is expected to lead to better credit differentiation in the pricing. Furthermore, the impact of Basel II may lessen the prevailing importance of the current supply-demand dynamics and could also promote more efficient loan pricing with differentiation according to the risk profile of the borrowers.

## MARKET-RELATED RISKS

### Interest rate risks not materially changed

Banks are exposed to interest rate risks either directly, via interest rate-sensitive positions in their trading and banking books, or indirectly through credit risk. Interest rate risk scenarios may include, on one hand, a sudden upturn in long-term interest rates or, on the other hand, a protracted low interest rate environment associated with a flattening of the yield curve. It should be emphasised, however, that while the gradual increase of long-term interest rates remains the main scenario, a more protracted period of low long-term yields cannot be excluded. Such a scenario would imply risks to banks mainly due to reduced earnings from the core maturity transformation business.

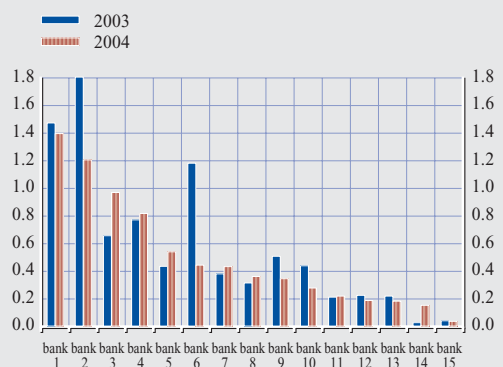
The relative size of capital requirements provides estimates for banks' direct exposures to interest rate risk. Information available on interest rate VaR for a sample of 15 large euro area banks indicates that several large banks increased their exposure to interest rate risk in 2004, whereas others reduced their exposure to a significant extent (see Chart 4.8). Based on country-level information and financial results of large banks, some banks might have further increased their risk-taking in the first half of 2005. It is important to stress, however, that the

VaR values remain low relative to banks' capital or income.

Interest-sensitive positions in the banking book are another source of potential direct losses stemming from adverse changes in interest rates. However, given the lack of harmonised information across both banks and Member States, it is difficult to gauge the relative importance of this type of risk exposure across the euro area banking sector. It can, nevertheless, be expected that banks in countries where fixed income portfolios

**Chart 4.8 Interest rate VaR for selected large euro area banks**

(2003 - 2004, % of Tier 1 capital)



Source: Financial disclosures of banks.

account for a significant part of the banking book may be particularly vulnerable to interest rate increases.

The indirect effects of potential interest rate increases that could materialise via credit risk may be more important for banks than the risk of direct losses.<sup>7</sup> In this context, the risk of increased correlation between interest rates and credit risk may also be considered as an important source of risk for banks. A possible sudden widening of credit spreads triggered by an increase in risk aversion or a significant negative credit event could affect banks through a rise in credit risk in relation to certain asset classes (such as corporate and emerging market-related loans), as well as through an increase in trading book losses.

To conclude, there are some indications that banks may have increased their trading book-related exposures over the past year, although the relative size of these exposures appears to have remained modest. Nevertheless, indirect effects implied by certain interest rate risk scenarios may be more significant, although on different time horizons.

In the short term, an unanticipated large increase in long-term interest rates could have a considerable short-term impact on banks' profitability by prompting a deterioration in credit quality and lower credit demand. To maintain profitability, these losses would have to be balanced by increased income from maturity transformation on new loan businesses.

A prolonged period of low long-term interest rates, on the other hand, would have a negative impact on banks' net interest income and could encourage banks to seek revenues from riskier activities such as lending to emerging markets. Moreover, the low interest rate environment could contribute to a further build-up of financial imbalances, for example through a rise in private sector indebtedness, which may have an impact on banks' credit risk, but with a significant time-lag.

#### Direct exchange rate exposures remain contained

Banks' foreign exchange rate exposures can be classified into two types: direct and indirect. Country-level information available for the first half of 2005 suggests that no significant change in the direct exposure of banks to exchange rate risk has taken place. Banks' open foreign exchange positions have in general remained low, both in absolute terms and as a share of regulatory own funds. Consolidated data for 2004 show that the share of euro area banks' trading book own funds requirements for foreign exchange risk remained broadly unchanged from 2003 (see Table S8). These exposures are generally lower than the requirements for debt or equity instruments.

Moreover, there is little evidence of currency mismatches between the asset and liability sides of banks' balance sheets on an overall basis. Nevertheless, some risks may exist for banks with branches or subsidiaries in faster growing retail markets. These institutions may be exposed to currency risk via unhedged currency mismatches as well as to the translation of currency changes on the balance sheets of subsidiaries recorded in other currencies than their domestic currency.

Banks can also be indirectly exposed to foreign exchange risk through changes in the competitiveness of non-financial firms or defaults of loans denominated in foreign currencies. The former type of indirect effects would have an impact not only on banks with open positions in foreign currencies, but in general on all banks whose borrowers' credit quality could suffer because of a loss of competitiveness. The latter type of indirect effects could materialise via repayment difficulties triggered by adverse currency movements in those countries where substantial lending in foreign currencies, both to households and corporates, has been encouraged by favourable interest rate differentials. So far there has been little sign that the fluctuations in

<sup>7</sup> See ECB (2005), *Financial Stability Review*, June, Box 12.



the euro exchange rates have translated into balance sheet problems for firms. However, it is possible that large exchange rate movements related to a correction in global imbalances and the associated adjustments in consumption in deficit countries could pose problems for euro area banks.

### Equity market exposures increased

Consolidated data for 2004 show that the expansion of trading activity contributed to a slight increase in euro area banks' exposures to equity market risk as measured by the increase in the share of the banks' trading book own funds requirements for this risk category (see Table S8).

Since the publication of the June 2005 FSR, banks' income is likely to have increased both in terms of fees and commissions and in terms of trading activity, given that equity markets in almost all euro area countries recorded further gains between June and early November 2005. In some cases these revenue sources could have more than offset lower income from the core maturity transformation business.

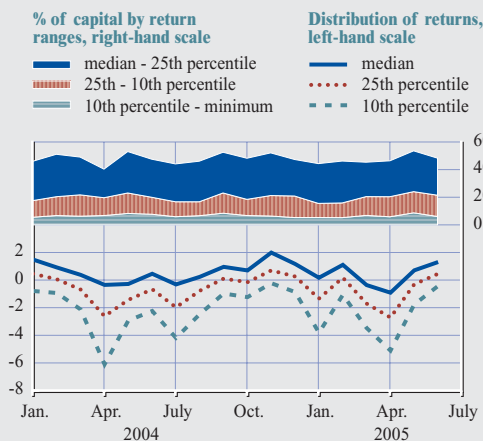
### Exposures to hedge funds warrant monitoring

Since early 2003, inflows into hedge funds have grown at a brisk pace. This development continued throughout 2004 and into the first half of 2005, although with some moderation in the second quarter of 2005 due to poorer hedge fund return performance. In particular, certain credit strategies suffered in March-April 2005, owing to market developments associated with the downgrades of GM and Ford to sub-investment-grade (see Chart 4.9). As a result, some banks may have faced higher risks on their trading and lending exposures to hedge funds during this period.

Banks' agreements with hedge funds usually include triggers of net asset value (NAV) decline, which when breached would allow banks to terminate all transactions and seize the collateral held. NAV can fall for two main reasons: negative performance, or investor redemptions. Commonly, 15-20%, 25-30% and 35-45% thresholds are applied for NAV declines during one, three and 12 months respectively on a rolling basis. In the first half of 2005, the share of hedge funds breaching

**Chart 4.9 Distribution of hedge fund returns**

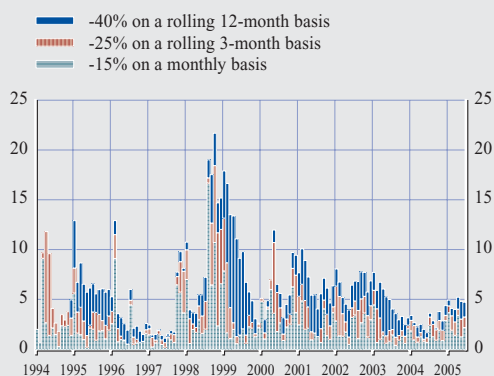
(Jan. 2004 - June 2005, %, net of all fees)



Sources: Lipper TASS database and ECB calculations.  
Note: Excluding funds of hedge funds.

**Chart 4.10 Share of hedge funds breaching triggers of net asset value (NAV) decline**

(Jan. 1994 - June 2005, % of total NAV)



Sources: Lipper TASS database and ECB calculations.  
Note: Excluding funds of hedge funds. NAV is equivalent to capital under management, i.e. its declines include redemptions. If several assumed NAV decline triggers were breached, then the fund in question was included into only one group with the shortest rolling period.

assumed triggers was higher than in 2004 (see Chart 4.10). Barring weak performance or higher levels of investor withdrawals, this fact could also indirectly signal a more active use of leverage among hedge funds globally.

An additional issue is the potential operational risk related to the increased involvement of hedge funds in the markets of complex structured credit products. The tendency of hedge funds to take a more short-term view on these products, as opposed to traditional investors who often hold the instruments to maturity, has increased the number of settlement procedures required to verify the holder of the asset after a trade has taken place. It cannot be excluded that in more stressed market conditions, when a large number of investors may be willing to exit similar trading positions

simultaneously, accumulated settlement backlogs could worsen the distortions to the functioning of the markets that are generated by an unwinding of “crowded trades”.

For banks, the greatest challenge remains the interaction of market, credit and illiquidity risks when larger price movements or unexpected changes in correlations force hedge funds to liquidate their leveraged and possibly undiversified positions. In such cases, leveraged market risk faced by hedge funds leads to credit risk for banks, which could be further exacerbated by the drying up of liquidity in affected markets. Moreover, the so-called crowding of hedge fund trades could further magnify the risks for banks, especially if banks’ proprietary trading desks use similar hedge fund-like strategies (see Box 14).

#### Box 14

##### LARGE EU BANKS’ EXPOSURES TO HEDGE FUNDS

Over the last couple of years, the hedge fund industry has expanded rapidly. Because of the important role that hedge funds play as participants in financial markets and as counterparties to financial institutions, especially banks, it has become increasingly important to monitor their activities and to assess the implications for financial stability. Against this backdrop, the ESCB Banking Supervision Committee decided to investigate the links between EU banks and hedge funds. This Box reports on the main findings of this survey.<sup>1</sup>

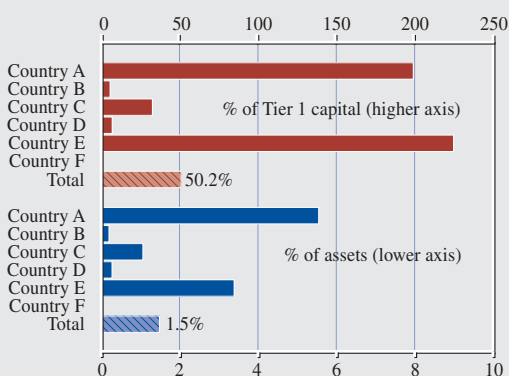
The survey excluded subsidiaries and branches of non-EU banks, some of which, primarily US ones, were leading global financing and trading counterparties of hedge funds. More than 40 EU banks from 14 countries provided qualitative comments and sometimes quantitative data on their connections with hedge funds. Based on the provided coverage information, 35 surveyed large banks (including 11 smaller banks with mainly investment exposures) as a group constituted around 1%, 55% and 38% of respectively the total number, consolidated assets and Tier 1 capital of all eligible banking groups in these countries. Some quantitative data was supplied by 22 large banks from seven EU Member States.

Regarding banks’ *financing exposures*, at the end of 2004, for the 14 large banks from six countries (AT, DE, ES, FR, NL and SE), the absolute amount of cash lending to hedge funds collateralised with securities (e.g. via reverse repurchase agreements) totalled almost €100 billion, and large banks from two countries clearly dominated in the sample (see Chart B14.1). For the smaller sample of five banks from four countries, which also provided 2003 data, lending increased 1.5 times in 2004. In general, banks extended either no or only negligible

<sup>1</sup> ECB (2005), *Large EU banks’ exposures to hedge funds*, November.

**Chart B14.1 Cash lending to hedge funds collateralised with securities**

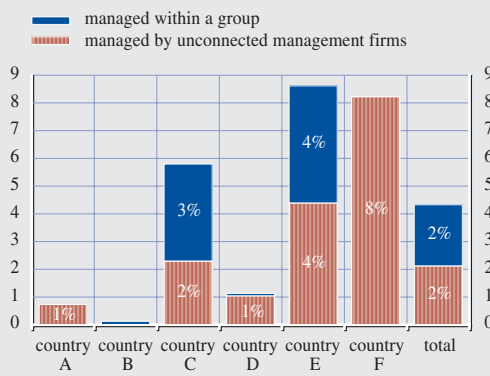
(end-2004, % of Tier 1 capital and assets)



Source: Banking Supervision Committee.  
Note: Based on a sample of 14 large banks from six EU Member States.

**Chart B14.2 Investments in hedge funds**

(end-2004, % of Tier 1 capital)



Source: Banking Supervision Committee.  
Note: Based on a sample of 16 large banks from six EU Member States.

amounts of unsecured lending, and many banks had policies completely forbidding unsecured credit exposures to hedge funds. A number of banks indicated that lending spreads had declined over 2004, especially for lending to larger hedge funds, as competition in this segment was the most intense.

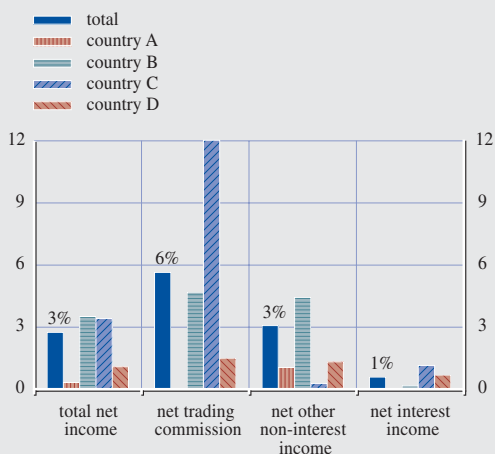
In many EU Member States *investments* in (funds of) hedge funds were the major and sometimes the only form of direct links with the hedge fund industry. Banks saw such investments as a way of gaining attractive risk-adjusted returns and improving the diversification of their investment portfolios. At the end of 2004, the total amount of investments in hedge funds by 16 large banks from six countries (AT, DE, ES, FR, NL and SE) exceeded €9.4 billion, although most of these investments were made by large banks in two countries (see Chart B14.2). In 2004, total investments by the smaller sample of five banks from four countries that also provided 2003 data increased by 52%, and allocations to unconnected hedge funds grew more rapidly.

Regarding *trading exposures*, for five large banks from three countries (DE, FR and SE) the estimated gross market value of OTC contracts outstanding with hedge funds in derivatives made up 2.7 % of all outstanding banks' OTC contracts in derivatives at the end of 2004. In the case of OTC interest rate derivatives, the share was 2.4%. Based on banks' comments and some quantitative evidence, it seems as if hedge funds were not key banks' counterparties in credit risk transfer markets and probably, on aggregate, were net credit protection buyers from banks.

Finally, on banks' *income exposures*, according to the quantitative data from nine large banks from four countries (AT, FR, NL and SE), banks earned nearly €0.8 billion from hedge funds in 2004. However, the share of net income derived from hedge funds was not high in relation to total net income and its sub-components, although proportions were higher for net trading commissions (see Chart B14.3). Across countries, net trading commissions made up the largest share of total net income derived from hedge funds. Moreover, for the smaller sample of four banks from three EU Member States that also provided 2003 data, the growth of total net income and its sub-components derived from hedge funds was much faster than the net income

Chart B14.3 Share of net income derived from hedge funds

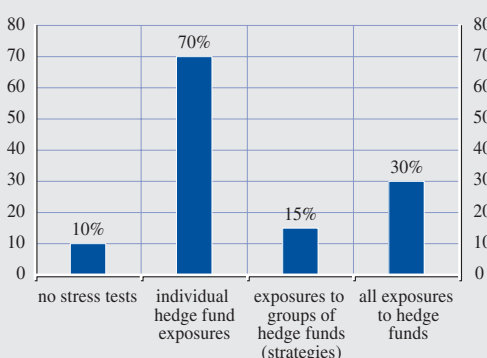
(2004)



Source: Banking Supervision Committee.  
Note: Based on a sample of eight large banks from four EU Member States.

Chart B14.4 Scope of stress testing

(% of banks, answers not mutually exclusive)



Source: Banking Supervision Committee.  
Note: Based on a sample of 20 large banks from seven EU Member States.

growth from all activities in 2004. This positive contribution may further intensify banks' efforts to foster hedge fund-related business and to attract more hedge fund clients, most likely putting further pressure on applied price and non-price credit terms.

With respect to risk management practices, most banks that extensively dealt with hedge funds had specific guidelines for this interaction as well as advanced risk management systems, or were in the process of further enhancing them. Surveyed banks generally had stringent requirements for exposures to hedge funds, with a strong emphasis on collateralisation. Nearly all cash-lending exposures to hedge funds were collateralised. Moreover, many banks with higher financing and trading exposures used sophisticated potential future credit exposure (PFE) measures to calibrate the expected downside risks of their hedge fund exposures that arise from the interaction of market, credit and illiquidity risks. Most banks also reported that they used stress tests to evaluate the potential effects of volatile or illiquid markets on their exposures. Regarding recent developments, banks did not see any systematic increase in risk-taking, as leverage levels across hedge fund clients seemed to be moderate and lower than in 1998, even though funds of hedge funds were reported to be increasing leverage. It has to be noted, however, that banks generally did not have any information on off-balance sheet leverage arising from trading in derivatives.

The survey also highlighted several areas with scope for further improvement that could become a cause of concern, particularly if the current rather benign market conditions were to change abruptly. These are:

- (i) *counterparty discipline*, as applied by banks, was found to be under pressure owing to highly competitive market conditions. Hedge funds, particularly the larger ones, were successful in negotiating less rigorous credit terms, including, for example, lower lending spreads, higher NAV decline triggers or trading on variation margin only;

- (ii) most *stress tests* applied by banks, particularly the regular ones, included only historical scenarios and often were applied to individual hedge funds only (see Chart B14.4). In addition, the stress testing of collateral was less common and offers further scope for improvement;
- (iii) *aggregation* by banks of their exposures to hedge funds across the entire financial group and/or different business areas/geographical regions was sometimes seen as problematic;
- (iv) hedge fund *disclosures* and *information on leverage* were, despite some progress, lagged and not always adequate. In many cases hedge funds still provided banks with relatively crude measures of leverage, although an increasing number of hedge funds were supplying more advanced risk-based measures of leverage;
- (v) banks' descriptions of their risk management practices also raised questions whether banks were sufficiently taking into account and/or had enough timely *information on the whole portfolio structure of hedge funds*, particularly on the larger ones with financing and trading relationships with several counterparties.

All in all, direct exposures to hedge funds of the large EU banks surveyed varied across countries and generally were not substantial in relation to banks' balance sheets and total revenue. However, even the limited data provided indicated that exposures were growing rapidly, although in most EU Member States these have remained negligible and/or mainly in the form of investments. It is very likely that the absolute and relative size of exposures to hedge funds will increase further in line with the continuing expansion of the whole hedge fund industry, and in particular its European segment. Most of the recommendations that were raised after the near-default of LTCM remain relevant, and banks should further continue to strengthen the risk management of their exposures to hedge funds. Moreover, banks should resist market pressures to lower credit standards applied and should continue to insist on more transparency from hedge funds.

#### Emerging market exposures increased further

As discussed in detail in sub-section 1.1, against a background of increasing commodity prices and a low interest rate environment, the economic performance in many emerging markets was rather favourable in the first half of 2005. Consequently, available data suggest that euro area banks further increased their exposures to these countries (see Charts S59 and S60 and Table S4).

Banks have particularly increased their already large exposures to Latin American countries where most large economies, with the exception of Argentina, have seen further inflows. Exposures have risen particularly

strongly in Mexico and in Brazil, owing to the rather benign economic performance of these two countries which could have eased earlier concerns about risks arising from investments in the local bond markets. Completed negotiations on the restructuring of the defaulted debt in Argentina could have mitigated one source of uncertainty in the market. Nonetheless, international investors, including some euro area banks, were forced to accept a significant discount on their claims on debt issued by the Republic of Argentina.

Exposures of euro area banks to selected markets in Asia also either stabilised or increased further.

### 4.3 SHOCK ABSORPTION CAPACITY OF THE BANKING SECTOR ON THE BASIS OF MARKET INDICATORS

#### MARKET INDICATORS CONTINUE TO SUGGEST A POSITIVE SHORT-TERM OUTLOOK

Throughout much of 2004 and 2005, financial market indicators suggested that market participants were still optimistic and confident about the robustness of euro area banks and the banking industry's future earnings prospects. Therefore, for the time being, the markets seem rather convinced that the euro area banks' shock absorption capacity remains comfortable, despite the continued decline in loan loss provisioning reported in 2004.

The ratio of banks' share prices relative to the general stock market index rose overall between late 2003 and 2005, reaching new heights in early November after a temporary decline in the second quarter of 2005. Despite a slight decrease of late, the bank stock market index remains well above the market index (see Chart 4.11). This suggests that market

participants may have become more optimistic about the future earnings prospects of banks, and/or that they perceived the risks facing the banking industry to have declined. On the performance side, euro area banks' profitability improved significantly in 2004 and in the first half of 2005 (see also sub-section 4.1), creating expectations of further growth. On the vulnerabilities side, euro area banks' credit risk outlook also has tentatively improved (see sub-section 4.2). In particular, the substantial reduction in the number of corporate sector defaults and non-performing loans is legitimising market participants' rather benign perception of the risks lying ahead.

Despite the generally favourable developments at the level of the euro area banks' stock index, uncertainty – as captured by increased standard deviation of the RND function derived from options prices – has increased since the first quarter of 2005 (see Chart 4.12). This could reflect uncertainty regarding the general macroeconomic and financial environment,

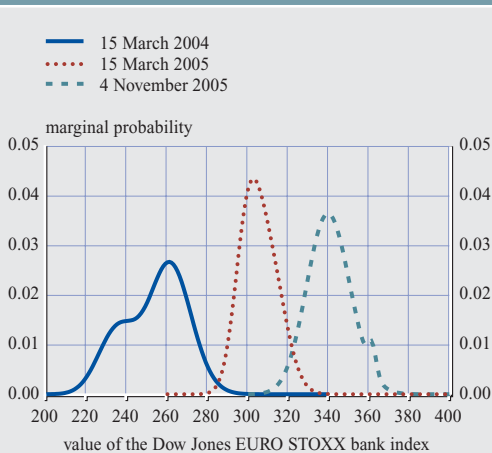
**Chart 4.11 Ratio of the Dow Jones EURO STOXX bank index to the overall market index for the euro area**

(Jan. 1999 - Nov. 2005, index: Jan. 1999 = 100)



Source: Thomson Financial Datastream.

**Chart 4.12 Risk-neutral probability density function on the Dow Jones EURO STOXX bank index**



Sources: Bloomberg and ECB calculations.

Note: The methodology for estimating the risk-neutral probability density functions is explained in Box 13 of the June 2005 FSR. The full range of strike prices needed to calculate the function can generate a measure of standard deviation that can from time to time slightly deviate from the index implied volatility figures that are also provided by Bloomberg and reported in Charts S66 and B15.1.

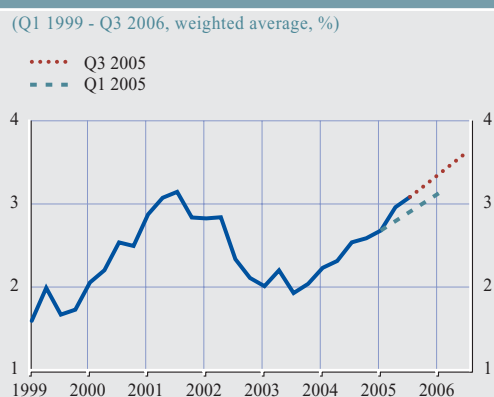
and the potential impact on banks' future profitability. Nevertheless, possibly reflecting a series of positive financial results by several large banks published in late October and in early November, the function remained skewed to the right, suggesting that market participants continued to assign a higher probability to near-term increases rather than to decreases in the stock index.

Supporting the hypothesis of positive future earnings prospects, in the third quarter of 2005 the earnings-per-share forecasts for large banks in the euro area showed a continued very positive outlook. (see Chart 4.13).

The fact that the euro area banks' earnings grew rather steadily in 2004 and until early November 2005, while stock prices temporarily dropped in the second quarter, is reflected by the V-shaped development in the price-earnings ratio (see Chart S65). Growth in banks' earnings in this period was still mainly driven by improvements in cost efficiency, lower provisions for loan losses, and a further increase in lending to households, as highlighted in sub-section 4.1.

Turning to market-based assessments of the resilience of the euro area banking sector, the median distance-to-default (DD) for the set of large euro area banks fluctuated throughout the first ten months of 2005 between very comfortable levels (see Chart S62).<sup>8</sup> For banks in the lowest percentile, there was a notable improvement in the DD in early 2005, followed by a drop in the second quarter. The temporary increase in default risks most likely reflected the turbulence in credit markets caused by the GM/Ford downgrades in April 2005. Overall, the behaviour of this indicator is in line with the improvement in euro area banks' performance and the overall balance of risks facing the banking sector discussed in the other parts of this Review. According to this information, the euro area banking sector would, therefore, be in a comfortable position to honour its debt obligations, and continues to move away from the possibility of future financial distress.

**Chart 4.13 Large euro area banks' earnings per share (EPS) and 12-month-ahead forecasts**



Sources: Thomson Financial Datastream, I/B/E/S and ECB calculations.

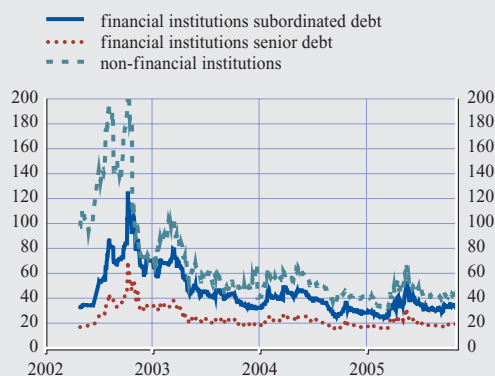
CDS spreads on the debt of euro area financial institutions steadily declined for most of 2004. However, these spreads widened in the second quarter of 2005 (see Chart 4.14), with this deterioration apparently being driven by the two large corporate downgrades. Investors' concerns about possible exposures of large euro area banks to the troubled automobile sector proved to be limited, although by no means negligible, as witnessed by the widening of euro area banks' subordinated debt spreads to over 50 basis points. These spreads subsequently reverted back towards the low levels seen at the beginning of 2005.

Spreads in the offers to buy and sell protection on European non-financial institutions' debt suffered a similar widening in the second quarter. Although the widening of these spreads was also rather short-lived, spreads resumed at levels slightly higher than those seen in the first quarter of 2005. Throughout 2004 and 2005 spreads on both senior and subordinated debt issued by financial institutions remained systematically lower than spreads on non-financial institutions' debt, which reflects confidence among

<sup>8</sup> The DD measures the distance between the market value of a firm's (a bank's) assets and the point at which it is insolvent. For more details, see ECB (2005), *Financial Stability Review*, June, Box 14.

**Chart 4.14 European financial and non-financial institutions' credit default swaps**

(May, 2002 - Nov, 2005, basis points, five-year maturity)



Source: JP Morgan Chase and Co.

Note: European financial institutions and non-financial institutions correspond to JP Morgan Chase & Co. definitions.

investors regarding the resilience and robustness of the euro area financial sector.

A comparison between the message that emerges from the forward-looking financial market indicators, on one hand, and the view that is provided by the assessment of risks in the previous sub-section, on the other hand, points towards a common baseline scenario of continuing euro area banking sector stability.

However, while the market indicators analysed in this section necessarily focus on the most likely outcome, risk assessment can provide some hints about the distribution of risks around this baseline scenario. On the negative side, there is uncertainty regarding the near-term macroeconomic outlook, particularly due to the very high level of oil prices, continuing imbalances in the global financial system, as well as the increasing indebtedness of the household sectors in most euro area countries. Given the above, the vulnerabilities arising from the low level of provisioning by euro area banks could materialise in a scenario whereby credit conditions deteriorate more markedly. On the positive side, high levels of profitability could have increased banks' resilience in the short term. In addition, banks in the euro area have improved their risk management, which is likely, at least partially, to shelter them from severe losses in the event of worsening credit quality.

Finally, looking at the developments in the volatility of euro area banks' stock prices, this positive assessment could extend to the markets' current perception regarding the risk of a cascading failure in the euro area banking system (see Box 15).

### Box 15

#### A DECOMPOSITION OF EURO AREA BANK STOCK VOLATILITY

Since the recovery of the euro area stock markets started in March 2003, the Dow Jones EURO STOXX banking sector index has performed strongly, increasing by roughly 80% up to November 2005.<sup>1</sup> Moreover, the upturn in euro area bank's stock prices has been accompanied by a declining trend in various measures of stock market uncertainty. In this respect, both realised volatility and forward-looking measures such as implied volatility on options of the bank index have declined in tandem to relatively low levels by historical standards (see Chart B15.1). This development of lowered uncertainty would imply that the risks facing the European banking sector are currently assessed as rather benign. By using data on individual bank stocks, this Box decomposes the decline in overall bank index volatility into two separate parts: the first measuring the contribution from single stock variances; and the second reflecting the covariation between stocks making up the index. Given that the degree of

<sup>1</sup> The Dow Jones EURO STOXX 50 has increased by slightly less than 50% over the same time period.



covariation among individual banks' stock returns is important for assessing the risk of common vulnerability to similar shocks, and that this covariation from time to time may be dominated by some subset of banks (possibly changing over time), this decomposition may also provide some tentative hints about changes in the "systemic risk" embedded in financial market prices.<sup>2</sup>

In order to extract time-varying measures of the volatility of individual stocks and the correlation structure between them, a multivariate GARCH model of daily returns for 38 banks included in the Dow Jones EURO STOXX banking sector index is employed.<sup>3</sup> These estimates are then used – together with the individual weights of the banks represented in the index – to decompose the overall index volatility into both the individual variance part and the covariance part. The standard expression describing the variance of a portfolio of assets is used for the decomposition:

$$\sigma_{Portfolio}^2 = \sum_{i=1}^n \sum_{j=1}^n w_i w_j \sigma_{ij} , \quad (1)$$

where  $\sigma_{Portfolio}^2$  is the total variance of the portfolio and  $w_i$  represents the weight of the  $i$ :th individual stock. Chart B15.1 shows an annualised version of the calculated portfolio volatility together with the evolution of the implied volatility for the banking index and the realised index volatility. Given the rather small and unsystematic difference between the three volatility measures, the multivariate volatility model that underlies variance expression (1) may be regarded as providing a fairly sound illustration of volatility developments over the sample under consideration.<sup>4</sup>

One simple way of gauging information regarding euro area banking sector risk is to consider the evolution of components of expression (1), which sums elements of the co-movement between stocks. For the purposes of financial stability analysis, risk assessment typically depends on these covariance patterns, even if overall volatility is low. However, not all banks represented in the index are necessarily equally important in terms of their contribution to the total covariance component. Taking this consideration into account, the variance decomposition proposed here might shed some light on the impact of some subset of banks on total volatility.

The analysis shows that the contribution from the covariance part in (1) has remained more or less unchanged over the last few years for the index in total, fluctuating at around 85% of total portfolio variance.<sup>5</sup> The stable evolution of this proportion confirms that the recent decline in the volatility of the banking index has been driven by a reduction in the covariation between individual bank stocks.

2 Bank stocks are assumed to be efficiently priced in that they reflect all publicly available information, both in terms of individual banks' balance sheet risks and the relationships between different banks' risks.

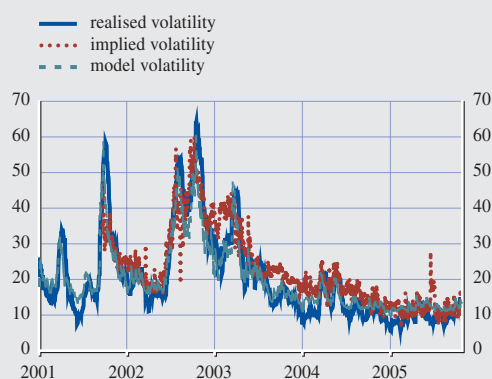
3 Ten banks, accounting for less than 9% of the total bank index, have been excluded from the calculations owing to data limitations. Data from 1 June 2000 to 1 November 2005 have been used to estimate a Dynamic Conditional Correlation model with GARCH(1,1) margins. See R. Engle (2002), "Dynamic Conditional Correlation – A Simple Class of Multivariate Generalized Autoregressive Conditional Heteroskedasticity Models", *Journal of Business and Economic Statistics*, Vol. 20, No. 3, July.

4 Comparing realised volatility and volatility measures extracted from options prices may be somewhat misleading, as the former is backward-looking while the latter is forward-looking. However, as market participants tend to use realised volatility when forming their expectations about future volatility, the two measures usually exhibit similar movements over time.

5 This finding is not surprising, given that the bulk of total risk in a diversified portfolio should be made up of the covariance between the individual stocks.

**Chart B15.1 Realised, implied and model-based volatility on the Dow Jones EURO STOXX bank index**

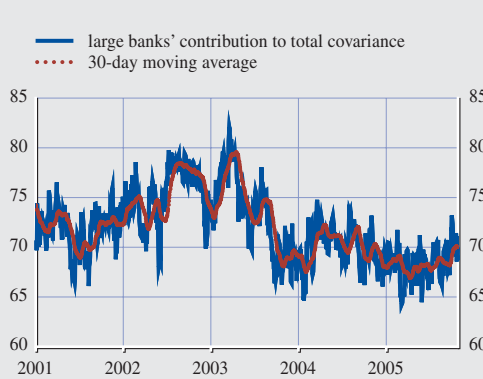
(annualised standard deviation of daily returns, %)



Sources: Bloomberg and ECB calculations.

**Chart B15.2 Covariance contribution of the ten largest banks included in the Dow Jones EURO STOXX bank index**

(% of total index covariance)



Source: ECB calculations.

From a financial stability perspective, increased co-movement between large institutions might be perceived as particularly important. An estimate of the variance contribution from a subset of the ten banks with the highest weights in the index – comprising about 60% of the total market capitalisation – shows that the level of co-movement actually declined between March 2003 and November 2005. Chart B15.2 shows that the contribution from these ten institutions alone in terms of covariation was reduced by approximately 10% of total covariance, thereby suggesting a slight reduction in “systemic risk” as measured by this particular indicator. Thus, the change in the covariance structure among euro area banking stocks, together with the observed reduction in implied volatility, lends some support to the view that risks are currently assessed as being manageable for the banking sector as a whole.

### THE UPWARD MIGRATION IN CREDIT RATINGS HAS SLOWED DOWN

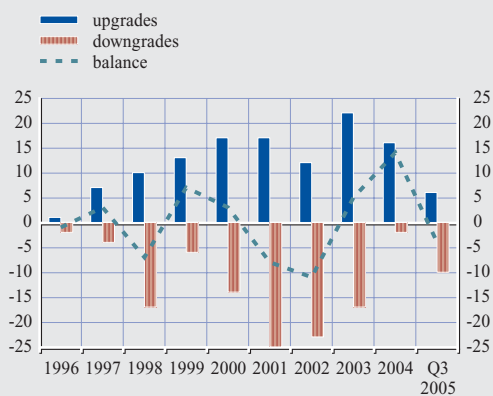
The generally positive assessment of the resilience of the euro area banking sector, although qualified by downside risks, is broadly shared by the three major rating agencies, which report that the average credit quality of EU (debt) issuers improved further in 2004 and in the first two quarters of 2005, albeit at a decelerating rate. However, for the set of western European banks, Moody’s reports a significant decrease in the upgrade-to-downgrade ratio from 4 in 2004 to 0.5 in the first half of 2005. This indicates that throughout the first six months of 2005, the number of downgrades was twice the number of upgrades (see Chart 4.15 where the dotted line denotes the difference between upgrades and downgrades). Moderate economic growth and

increasing competition were seen as the main factors behind the slowdown in the upward migration rate. The still positive assessment of the credit quality of banks was, on the other hand, supported by the strength of banks’ earnings growth in 2004 and the first half of 2005, as well as some signs of acceleration in the pace of cross-border consolidation in the EU banking sector.

The ratings of the largest euro area banks remained stable during the second quarter of 2005. However, there seems to remain little upside potential for the long-term ratings of these banks, as the majority are now rated in the “AA” range. Most upgrades affected banks rated within the “A” to “B+” range, while there were no upgrades of banks with a rating of “A” or higher.

**Chart 4.15 Western European banking sector rating downgrades, upgrades and balance**

(1996 - Q3 2005, number)



Source: Moody's.  
Note: "Western European" corresponds to Moody's own definition.

#### 4.4 OVERALL ASSESSMENT

The financial conditions of euro area banks improved in 2004 and the first half of 2005, continuing the positive developments recorded in 2003. Profitability increased for the full spectrum of banks, including those national banking sectors that had substantially underperformed in previous years. This development was associated with sustained growth in lending to households, mostly for housing purposes, and an incipient recovery in lending to the corporate sector, including to SMEs. However, banks also experienced increased competition from their peers in granting loans, especially to households. This fact contributed to a continuing decline in the share of net interest income in total income and still rather narrow lending margins.

While euro area banks at least partially continued to exploit the benefits to profitability that can be reaped from cost-cutting, their profitability was also affected by the further decline in provisions. Given the contemporaneous improvement in asset quality, however, the coverage ratio has increased.

Overall, considering the outlook for euro area banks in the foreseeable future, broadly positive short-term indications of banks' conditions suggest that, notwithstanding some differences across countries, the euro area banking sector has benefited from generally benign credit and liquidity conditions. On the other hand, the banks in the euro area have achieved improved financial results in an environment of sluggish economic growth in many of the largest Member States. On the whole, the assessment suggests that the euro area banking sector is rather robust. However, from a longer-term perspective, certain internal and external risks to the banking sector could emerge.

Concerning internal risks, banks have faced mounting difficulties in increasing or maintaining their interest income and interest rate margins in mature markets, given the low interest rate environment and strong competition from their peers to secure sustained lending growth. As a result, banks may have started to loosen their credit standards, possibly increasing their future exposure to credit risk, or might have begun to search for alternative, possibly riskier, sources of income. A second internal risk is represented by the historically very low levels of provisions at present. Although the coverage ratio has increased, low levels of provisioning have left banks exposed to potentially high costs in the event of a deterioration in credit quality. Moreover, banks could potentially have already largely exhausted the boost to profitability that can be derived from cost-cutting or cost containment, thus reducing the number of sources they may resort to in order to maintain satisfactory profitability levels in the event of a deterioration in the credit environment.

The main external risks include increasingly high oil prices and persistently wide global imbalances. Although the direct exposures of euro area banks to these risks are likely to be limited, the risks posed by exchange rates

could prove to be correlated with the credit risks of non-financial sectors – especially firms in the export sector and their suppliers such as SMEs.

The interest rate risks faced by banks reflect the somewhat different impact that these external vulnerabilities could exert, if they were to materialise. While the main scenario remains one of gradually increasing long-term interest rates, the likelihood of protracted low long-term interest rates and a flat yield curve environment might have increased, potentially exposing banks to further difficulties in generating interest income from their core business. The current tightness of credit spreads could represent greater than normal market risk for banks, and may also have affected their pricing of risks in the context of corporate lending. Owing to the incipient recovery in borrowing from the non-financial corporate sector, which, per se, is a broadly positive development for banks' income differentiation, banks have also become more vulnerable to potential mispricing of credit risk.

Market indicators present a broadly positive forward-looking assessment of banks' risk and profitability outlook. However, most market indicators tend to focus on the most likely outcome, whereas an overall risk assessment should emphasise the most disruptive, although still plausible, outcome in terms of distribution of risks around this baseline scenario. The indicators that capture the distribution show somewhat increased uncertainty about future developments in banks' profits, possibly reflecting uncertainty regarding the macroeconomic and financial environment.

All in all, the current financial condition of euro area banks is broadly satisfactory, and no specific items can be identified that would trigger the emergence of the more negative scenario. However, despite the overall positive assessment in the near future, the combination of increased loan growth and lower provisioning may leave banks more exposed to credit risk and to a sudden deterioration in the currently benign credit and liquidity environment.

## 5 OTHER EURO AREA FINANCIAL INSTITUTIONS

*Profitability in the euro area insurance industry improved further in 2004. The strengthening of financial positions was mainly driven by strong underwriting results. Investment income, however, remained subdued in an environment of very low interest rates. Capital bases improved in both the non-life and reinsurance industries in 2004, whereas solvency positions in the life insurance industry remained unchanged. By late 2005, the outlook for the insurance sector seemed positive, with the risk facing the industry appearing rather contained.*

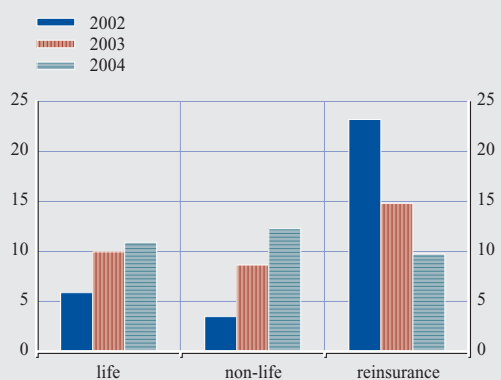
### 5.1 FINANCIAL CONDITIONS IN THE INSURANCE SECTOR<sup>1</sup>

#### FURTHER IMPROVEMENT IN PROFITABILITY IN 2004

In the life insurance sector, the average ROE in 2004 stood at 10.9%, up from 9.9% in 2003 (see Chart 5.1).<sup>2</sup> Non-life insurers enjoyed a significant improvement in profitability, with ROE reaching 12.2% in 2004, compared with 8.6% in 2003. By contrast, the reinsurance industry saw a significant decline in profits in 2004 with the average ROE dropping from 14.8% in 2003 to 9.7% in 2004.

**Chart 5.1 Return on equity in the euro area life, non-life and reinsurance sectors**

(2002 - 2004, %)



Source: Bureau van Dijk (ISIS).

## THE NON-LIFE INSURANCE INDUSTRY

The strengthening of non-life insurers' balance sheets in 2004 was entirely due to an improvement in the profitability of core business. Underwriting results, which turned positive in 2003, continued to improve in 2004, owing to strict pricing discipline on the part of euro area non-life insurers. Although there were some signs that premium prices had passed their cyclical peak, they declined only slightly in 2004 and remained above technical levels, reflecting adequate pricing of risks.

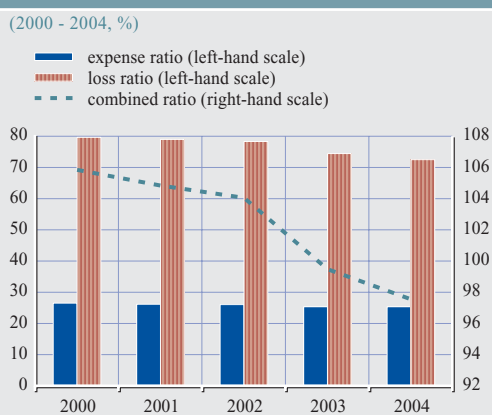
Growth in premium written, which edged up from 6.9% in 2003 to 7.2% in 2004, contributed to the improvement in core business profitability as measured by the combined ratio.<sup>3</sup> In 2003, given positive underwriting results, the combined ratio of the euro area non-life sector dropped below 100%, and in 2004 it declined still further (see Chart 5.2). The improvement was mainly due to tighter terms and conditions, which continued to limit the magnitude of claims to be paid. Indeed, the loss ratio, which measures the magnitude of incurred losses in the current year, decreased from 74.3% in 2003 to 72.3% in 2004, whereas the expense ratio stabilised in 2004 at 25.2%, after three years of improved cost control.

1 The assessment of the financial condition of the euro area insurance sector is based on unconsolidated accounts. This allows for the disentangling of large insurance firms engaged in life, non-life and reinsurance activities. The data source for balance sheet and income statement data was Bureau Van Dijk (ISIS database). The sample of firms is composed of 213 life insurers, 292 non-life insurers and 25 reinsurance companies.

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

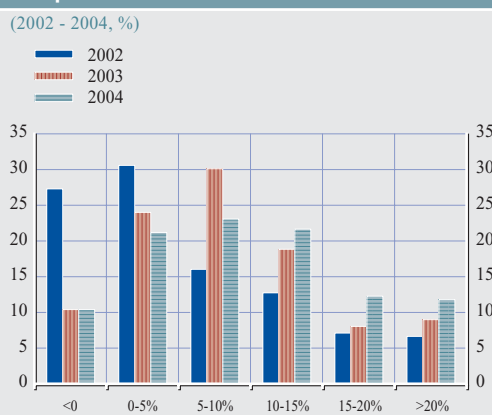
3 The components of the combined ratio allow the sources of profitability to be highlighted – cost-cutting and/or loss reductions. It is calculated as the sum of the loss ratio, which measures the magnitude of incurred losses for the current year (net losses and loss adjustment expenses/net premium earned), and the expense ratio, which provides information about expense control (underwriting and administrative expenses/net premium written). Typically, a combined ratio of more than 100% represents an underwriting loss for the non-life insurer.

**Chart 5.2 Expense, loss and combined ratios of the euro area non-life insurance industry**



Source: Bureau van Dijk (ISIS).

**Chart 5.3 Frequency distribution of return on equity of euro area life insurance companies**



Source: Bureau van Dijk (ISIS).

By contrast, net investment income in the non-life sector dropped by 3.4% in 2004, following a decline of nearly 3.0% in 2003. This was mainly due to a combination of declining euro area long-term interest rates and increasing bond holding in insurers' balance sheets throughout 2004. Bonds that are held in a "buy and hold" strategy are currently not marked-to-market in most of the countries of the euro area. Buy and hold bonds are valued at their amortised cost. Any changes in the bond valuation are reported as unrealised gains and are therefore not reported in the income statement. This accounting practice will be generalised in 2005 with the implementation of the International Financial Reporting Standards (IFRS). Hence, the decline in long-term interest rates in 2004 has simply led to insurers receiving lowered interest rate payments. As the new bonds bought typically had lower yields than those which had matured in 2004 and as the amount of these bonds bought largely surpassed the amount of bonds maturing in 2004, the overall impact on investment income and thus on profitability was negative.

### THE LIFE INSURANCE INDUSTRY

Notwithstanding the persistently low interest rate environment and the large outstanding stock of life insurance products with guaranteed returns, profitability in the life insurance

industry improved in 2004. This was mainly due to strong growth in sales of unit-linked products, lower bonus allocation, cost savings and the reduction of guaranteed rates of return on newly issued savings products. Furthermore, ongoing reforms of public sector pension schemes in the euro area favoured private saving in life insurance products. Legal changes and tax advantages that were introduced in France, Italy and Germany during the year also promoted growth in the demand for pension products. Although the environment of persistently low interest rates reduced the attractiveness of policies with guaranteed returns, this was partially compensated by the strength of demand for unit-linked products, the sales of which grew by 21.7% in 2004. This was, however, lower than the corresponding figure for 2003 of 31.3%. Net premium written by the life insurance industry increased by 7.4% in 2004, compared with 11.1% in 2003. As margins on unit-linked products are currently often higher than those on traditional guaranteed return policies, there is room for further improvement in profitability in the period ahead if the demand for these products remains buoyant. The investment income of the sector only grew by 2.4% in 2004, compared with 7.1% the previous year. This poor performance was mainly due to the decrease in long-term interest rates in the euro area during the second half of 2004.

The strengthening of profitability was not homogeneous among life insurers, and the weakest companies in particular did not succeed in increasing their earnings. At about 10%, the share of firms with negative ROE did not change in 2004 compared with 2003 (see Chart 5.3).

### THE REINSURANCE INDUSTRY

The deterioration of profitability in the euro area reinsurance sector in 2004 was broad-based. Net investment income dropped by 54.6%, following an increase of 143.3% in 2003. At the same time, net premium written declined by 7.4% in 2004, compared with zero growth in 2003.<sup>4</sup> Several factors account for the weakness of the profitability of reinsurers in 2004. In an environment characterised by significant balance sheet improvement, non-life primary insurers limited their ceded exposures to the reinsurance industry. Reflecting this, the retention ratio – a yardstick which measures the amount of risk that non-life primary insurers retain on their own account – increased in 2004 to 80.6%, up from 79.1% in the previous year.<sup>5</sup> This reduction in risk transfer to the reinsurance sector weighed negatively on the growth in premium written. Furthermore, it cannot be excluded that the decrease in premium written by euro area

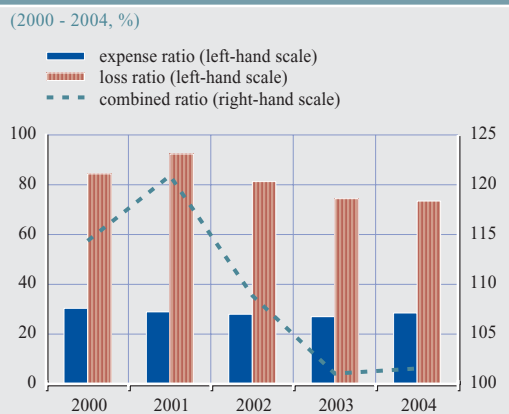
reinsurers may also have reflected some slight loss of market share, as premium prices declined only slightly in 2004.

The decline in premium written contributed to a slight increase in the combined ratio of the euro area non-life reinsurance sector from 101.0% in 2003 to 101.5% in 2004.<sup>6</sup> Increases in underwriting and administrative expenses also contributed to the slight deterioration in this ratio. By contrast, the loss ratio showed some improvement (see Chart 5.4).

### STRENGTHENING OF CAPITAL POSITIONS IN 2004 EXCEPT IN THE LIFE INSURANCE INDUSTRY

The capital positions of euro area non-life and reinsurance companies improved in 2004. The solvency positions of insurers may be broadly measured by the ratio of surplus to net premium written.<sup>7</sup> In the non-life industry, this ratio rose to 25% in 2004, up from 24.4% in 2003 (see Chart 5.5). This strengthening of capital positions resulted in part from the fresh capital brought by new entrants into the non-life sector, motivated by the rather strong levels of profitability. In particular, firms involved in

**Chart 5.4 Expense, loss and combined ratios of the euro area non-life reinsurance industry**



Source: Bureau van Dijk (ISIS).

4 To a certain extent, the rather high year-to-year volatility of the aggregated income statements of euro area reinsurers is a reflection of very high levels of business concentration. In 2004, the five and ten largest reinsurers accounted for 79.3% and 91.1% of the total premium written in 2004 respectively, an increase from 2000, when the corresponding figures were 75.1% and 86.9% respectively. This high concentration implies that any change in the strategy followed by one of the larger companies will make a significant contribution to the aggregated data for the euro area.

5 The retention ratio is measured as the amount of net premium written over gross premium written.

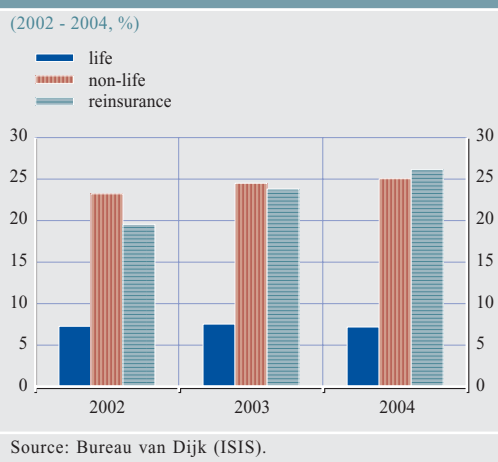
6 In the euro area, the non-life reinsurance business constitutes the bulk of reinsurance activity. Of the 29 reinsurance companies in the euro area with available financial accounts for 2004, only three were specialised in the life business, and they represented slightly less than 3.5% of the total premium written in 2004.

7 The capital position of non-life insurers and reinsurance companies is calculated as surplus over net premiums written; while that of life insurers as surplus over technical reserves. Whether the capital position of life companies is calculated as surplus over total assets or as surplus over total assets less linked products, the assessment remains identical with no improvement in the solvency position. The ratios for life and non-life/reinsurance companies are not comparable due to sector-specific accounting regulations regarding, for example, equalisation reserves.

life insurance turned to non-life activities in order to diversify their risk. A further improvement was also seen in the reinsurance sector in 2004, with the capital position reaching 26.1%, up from 23.8% in 2003. Despite rather subdued profits, the capital base of the reinsurance industry mainly grew through earnings in 2004 as companies limited the amount of dividends they distributed to their shareholders.

In the life insurance industry, there was a slight deterioration of solvency position from 7.5% in 2003 to 7.2% in 2004. Recognition of increasing policyholder life expectancy on annuity business led many euro area life insurers to revise their mortality assumptions that had previously underestimated so-called longevity risk (see Box 16). Hence, these firms continued to significantly strengthen their

Chart 5.5 Capital positions in the euro area life, non-life and reinsurance sectors



reserves, thus preventing a significant build-up of capital in 2004.

#### Box 16

##### AGEING POPULATION AND LONGEVITY RISK

As the so-called baby boom generations – i.e. those born between the mid-1940s and the mid-1960s – approach retirement, policymakers in many developed countries have become increasingly concerned about retirement funding and retirement income security. With ongoing pension reforms reducing the generosity of funding from public sources, more emphasis is being placed on private saving. However, the inherent uncertainty about the length of human life complicates any decision regarding saving for retirement. In particular, there is a risk that individuals may outlive their resources and could be forced to reduce their living standards quite substantially when they reach a more advanced age, or even risk falling into a poverty trap. Longevity risk,<sup>1</sup> which materialises when expectations regarding lifespan are not met, has two components.<sup>2</sup> *Individual* longevity risk is the risk that a person will die either prior to or after the average lifespan of his/her cohort. It can theoretically be diversified away by pooling risks in private annuity markets, where those who live longer than the average may benefit from the contributions of those who die earlier. *Collective* longevity risk concerns the risk of underestimating the average expected longevity. This risk poses more challenges than individual longevity risk because it cannot be shared within members of the same cohort by writing a large number of life policies. This Box discusses some of the challenges raised by collective longevity risk, for which no simple hedge may be found.

Governments, pension funds and to a less extent life insurance companies used to bear collective longevity risk. Due to the partial disengagement of governments from pension

1 Longevity risk concerns the upper end of the age distribution of the population. It differs from mortality risk, which is driven by short-term extreme events such as flu epidemics.

2 See M. King (2004), “What Fates Impose: Facing up to Uncertainty”, the Eighth British Academy Annual Lecture.



provision and the gradual change from defined benefit pension plans to defined contribution schemes, not only individual but also collective longevity risk has been increasingly transferred to the household sector. At present in the euro area, the risk of outliving resources is rather limited, as the bulk of pension income continues to originate from public sources and/or occupational defined benefit schemes. Nevertheless, further reforms are likely to shift risks towards households. Hence, there is the risk that households at retirement may find it difficult to convert accumulated wealth into a guaranteed stream of income until death. Liquid and efficient annuity markets could dampen this risk and eliminate the individual longevity risk that is now increasingly borne by households. However, adverse selection problems and difficulties faced by life insurers and pension funds in hedging collective longevity risk currently weigh on the development of such markets.

An adverse selection problem arises with the provision of individual annuities, because those who live longer than the average expected life span will tend to buy more annuities on a voluntary basis than others. Consequently, this raises the price of annuities, thus reducing the incentives of those new potential annuitants with shorter life expectancy to enter the market. Hence, only a very small proportion of saving is currently invested in annuities. In order to circumvent the adverse selection problem that is associated with the *individual* provision of annuities, collective schemes could be made compulsory. As a result, policy prices should converge to their fair actuarial prices as mortality tables of the *whole* population may replace those of annuitants currently used by annuity writers. However, any compulsory scheme would involve some problems of redistribution so that as a first step, annuities could simply be set as the default option in defined contribution plans instead of the current practice of lump sum withdrawals.

Regarding problems associated with hedging exposures to *collective* longevity risk, no simple solutions exist. This risk is currently concentrated in corporate defined benefit pension funds and in life insurance companies' balance sheets. Ideally, these institutional investors may desire to hold assets whose return is proportional to the average longevity of their annuitants in order as a hedge. Such hedging instruments do not exist yet and the absence of adequate hedging has already led to significant deficits in the reserves of pension fund balance sheets, and the problem has been exacerbated by the low level of interest rates. Indeed, when interest rates are low, any unexpected improvement in lifespan results in a significantly larger increase in reserves than the rise needed when interest rates are high.<sup>3</sup>

While the design of effective hedges for longevity risk would appear to be important, there are practical challenges in that there are many more potential buyers of longevity protection than there are sellers. Indeed, the appetite of reinsurers to take further longevity risk is very limited. Owing to the legal scrutiny of financial/finite risk reinsurance contracts, reinsurers have become more reluctant to provide insurance against longevity risk than in the past.<sup>4</sup> Furthermore, M&As have reduced the number of companies operating in this sector. Attracted by increasing premium prices, many reinsurers have also shifted resources to the non-life sector.

3 A 10% improvement in longevity by leads to an increase by 5.4% of the net present value of the immediate annuity – an immediate annuity being a regular income payable throughout life, which is usually secured in exchange for a lump sum – to meet an annual payment of 10,000 euro over 25 years, based on a 3% interest rate. With interest rates equal to 5% and 10% respectively, this figure would fall to 4.2% and 2.1%. Hence, life insurance companies and pension funds are concerned about interest rate/longevity correlation risk.

4 See Fitch Ratings (2005), "Reeling in the Years: VIF securitisation", Special Report on Insurance, Europe, June.

Given the lack of longevity insurance capacity within the reinsurance sector, the capital markets could provide innovative solutions to hedging longevity risk. In November 2004, the European Investment Bank/BNP Paribas announced their intention to issue a 25-year survivor bond, also called a longevity bond, where coupon payments would be linked to the proportion of the UK male population who were aged 65 in 2003 and who are still alive at the coupon date. The longevity risk in this operation will be born by the Bermuda-based Partner Re through a reinsurance contract. However, Partner Re has apparently made it clear that it has little appetite for additional deals. Since an active and liquid market for longevity bonds requires not only buyers but also sellers, there might be a role for governments to substitute for reinsurers. By assuming *collective* longevity risk, either as an issuer of longevity bonds or of long-dated annuities, governments would support the development of liquid annuity markets.<sup>5</sup>

Regarding the consequences for financial stability, the lack of transparency about longevity assumptions used for the calculation of reserves may expose shareholders of companies with corporate defined benefit plans to risks of significant declines in distributed profits and in stock prices following revelations of unrealistic assumptions in mortality rates. In the UK, as from 23 September 2005, new actuarial valuations will apply which make more prudent assumptions regarding longevity. The implementation of the new Statutory Funding Objectives requires the elimination of any potential deficits in UK defined benefit pension funds over a predetermined period that is likely to be set to ten years. Owing to the relatively short period of reserve rebuilding, most employers with defined benefit schemes incur a significant risk of financial distress, even in some cases a risk of insolvency. The choice of the discount rate – which is crucial in the assessment of underfunding – is still being debated (see Box 17).

5 The UK Debt Management Office conducted a consultation about the relevance of issuing annuity-type gilts. Most respondents – except policy advisers in the pension industry and trustees – did not support the project, pointing out concerns about the potential illiquidity of such instruments, in that annuities could be buy-and-hold instruments. Hence, no issuance of annuities will occur in the near future. See <http://www.dmo.gov.uk/gilts/public/consdoc/cons160305.pdf>.

Despite the favourable funding conditions that prevailed in 2004, life insurers in the euro area did not exploit external sources of funding to strengthen their capital position, as their access to financial markets remained limited. Instead, life insurers mainly followed a strategy of risk reduction in order to save capital. The risk of investment portfolios was reduced through a reallocation of asset portfolios in favour of bonds. Companies also continued to use financial/finite risk reinsurance to mitigate risks and to reduce solvency requirements.<sup>8</sup> Indeed, the retention ratio did not change between 2003 and 2004, remaining at 96.4%. Finally, those life insurers which managed to improve slightly their capital positions achieved this through the retention of profits by limiting dividend distributions.

Alternative risk management options involving securitisation are currently available to euro

area life insurance companies with the aim of managing their capital more efficiently. For instance, the availability of mortality bonds or, more recently, the securitisation of expected future profits from blocks of insurance business – so-called value of in-force securitisation<sup>9</sup> – has helped risk management by life insurers located outside the euro area, albeit so far not in the euro area itself.<sup>10</sup> For the first time in the euro area, in August 2005 small

8 These contracts involve a certain level of risk transfer from primary insurers to reinsurers, but with a limited exposure.

9 Value of in-force is the discounted value of the reserve releases expected to come through in future years based on a set of assumptions. It can therefore be thought of as a quantification of the degree of prudence in the reserves.

10 In the UK, both Barclays Life and Friends Provident have recently securitised the value of in-force business contained in closed and open blocks of life policies in order to raise efficiently regulatory capital. Swiss Re also completed a USD 245 million securitisation of in-force life insurance policies in January 2005.

European insurance companies called up capital through the issuance of CDOs on their subordinated debt.

## 5.2 RISKS FACING THE INSURANCE SECTOR

Despite the ongoing improvement in the financial condition of the euro area insurance sector, some risks do lie ahead. Among the exogenous sources of risks and vulnerabilities, the insurance sector faces market risks associated with the low level of long-term interest rates. There are also some risks within the sector itself.

Among the external sources of risk facing the euro area insurance sector, the most important appears to be uncertainty surrounding the expected future path of long-term interest rates (see Box 17). As market interest rates remain below the average guaranteed returns in some euro area countries, profitability will remain subdued. In the life insurance industry, any increase in long-term bond yields is likely to ease pressures on asset-liability mismatches in balance sheets. An improvement in solvency positions may be expected as long as the same

accounting rules are used to value both assets and liabilities – which is currently not the case in all euro area countries. This means that for those countries which apply the new accounting standards only on the asset side, the rise in long-term interest rates may prove detrimental to their solvency position. Indeed, this would decrease the present value of the assets, while liabilities would not be marked-to-market. On the positive side, rising interest rates might mitigate longevity risk, which is correlated with the level of interest rates (see Box 16). Longevity risk arises primarily from an incorrect assessment concerning people's longevity, and is exacerbated by the impact of low interest rates on the present value of future payments. The current flattening of the euro area yield curve does not pose a challenge for life insurers. Only an inverted yield curve with long-term interest rates that are lower than guaranteed rates would constitute a risk. The firms would then have the incentive to invest in the short term part of the yield curve, and by doing so would worsen the negative duration gap of their balance sheet. The sensitivity to interest rate changes may then be amplified as a result.

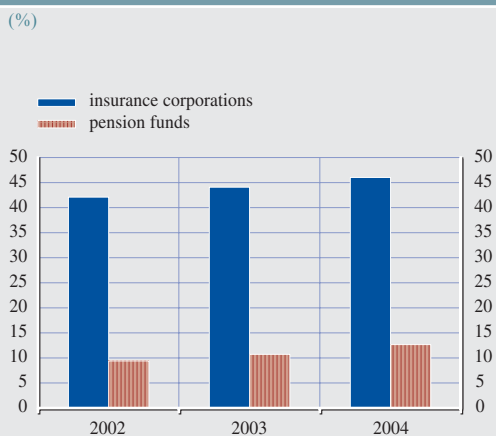
### Box 17

#### LOW INTEREST RATES AND BALANCE SHEET VULNERABILITIES OF LIFE INSURANCE COMPANIES AND PENSION FUNDS

Owing to population ageing, the size of pension funds and insurance companies' balance sheets has been growing rapidly. In the euro area, the total assets-to-GDP ratio of these institutional investors reached 58.5% in 2004, up from 51.3% in 2002 (see Chart B17.1). The decline in long-term interest rates since the 1990s and their persistently low levels have weakened the balance sheets of these institutions.<sup>1</sup> The important share of bond holdings in their investment portfolios has weighed significantly on profitability over recent years, which has remained subdued (see Chart B17.2). However, the main negative impact of low yields has been on the assessment of liabilities and therefore on companies' net debt. In those countries where bond yields influence the choice of the discount rate used for reserves funding calculations, the

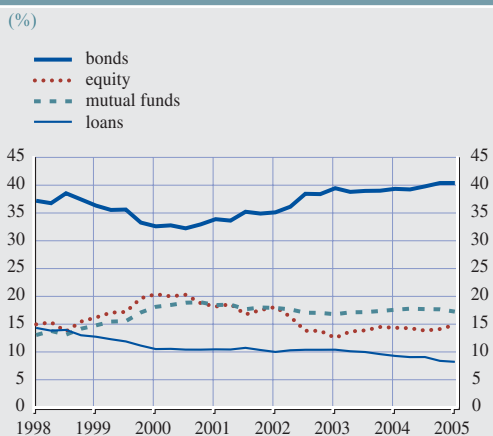
<sup>1</sup> The non-life insurance sector does not provide a mixture of long-term saving and insurance in the same manner as life insurance companies and pension funds. It essentially faces insurance risks arising from highly uncertain flows of claims. Because of their specific risk and their shorter liability duration compared to the life insurance industry, these portfolios typically include a higher proportion of equities and a significant proportion of short-term assets with low price volatility. They are therefore less affected by the low level of long-term interest rates.

Chart B17.1 Assets-to-GDP ratios of euro area insurance companies and pension funds



Source: ECB.

Chart B17.2 Assets' composition of euro area insurance companies and pension funds



Source: ECB.

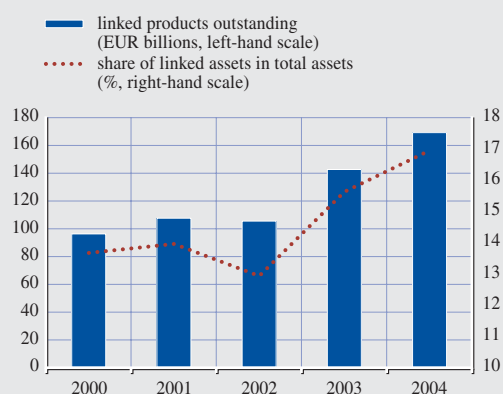
lower the market rates, the higher the present value of liabilities. Hence, any fall in long-term interest rates may lead to a significant funding gap in balance sheets, given the typically longer average duration of liabilities than of assets. This Box discusses some of the financial stability issues raised by the impact of the low level of long-term interest rates on life insurers' and pension funds' balance sheets.

In defined benefit pension funds, the long bull market for equities in the 1990s allowed contributions to be scaled back and even to be eliminated for several years. The resulting overfunding was furthermore amplified in some jurisdictions that had allowed constant or above-market discount rates to be used in the valuation of liabilities at a time of declining bond yields. The strong stock market performance in the 1990s also permitted life insurance companies, which sold traditional policies with high guaranteed returns, to record strong profits, even though profit margins were progressively eroded at the same time. Indeed, the difference between the yields earned on bond holdings on the assets side and the guaranteed rate to be paid to policyholders on the liabilities side continuously decreased, even becoming negative in some cases. For life insurance companies and pension funds alike, as annuity providers, the low yield context furthermore magnified the risks of underfunding owing to the increase in longevity beyond earlier actuarial projections. Indeed, when interest rates are low, any underestimation of longevity translates into a much larger funding gap, because the changes in the present value of liabilities are of a greater magnitude (see Box 16).

This phase of strong profitability in the pension and insurance industry came to an abrupt end with the bursting of the stock market bubble. The bear equity market from March 2000 to March 2003 and the sharp fall in the level of interest rates started to put pressure not only on profitability, but also on solvency positions. On the profitability side, both life insurance companies and pension funds have been affected by persistently low and declining interest rates, as they typically hold a high proportion of bonds in their assets, the bulk of which are held until maturity and are therefore not marked-to-market in most euro area jurisdictions. Regarding the solvency assessment, one important aspect is related to the asset-liability match. In cases of a perfect match between asset and liability cash flows at any future date, the choice

of the discount rate would not matter. However, given the current balance sheet mismatches, the choice of discount rates in assessing solvency is extremely important. To manage their balance sheet risks, both pension funds and insurance companies use asset liability management techniques (ALM), whereby the long-term balance between assets and liabilities is maintained through the choice of an asset portfolio with similar return, risk, duration and convexity characteristics to liabilities.<sup>2</sup> Owing to the limited availability of long-dated bonds for life insurers and long index-linked bonds for pension funds, the duration of the liability remains higher than that of the assets. Hence, as the asset liability matching is not perfect, their balance sheet is usually not immunised against interest rate changes.

**Chart B17.3 Linked products outstanding and as a share of total assets of euro area life insurance companies**



Source: Bureau van Dijk (ISIS).

The decline in interest rates over the last decade widened this negative duration gap because of a larger increase in the present value of the liabilities than that of the assets. As a result, the sensitivity of balance sheets and especially of capital bases to interest rate risk has increased. In the pension fund industry, greater use has been made of market-related discount rates following the collapse of the equity market, which has boosted the present value of pension liabilities. As a result, large funding gaps have suddenly been reported in pension funds' balance sheets.<sup>3</sup> In the life insurance industry, the discount rate used to assess technical reserves depends on the cost of capital. Therefore, it is likely to reflect, to a certain extent, the evolution of market interest rates, although the new accounting rules for the valuation of liabilities are only scheduled for 2007. As a result, lower interest rates may lead to a deterioration of solvency positions of life insurers.

To restore capital bases or reduce funding gaps, pension funds and life insurance companies have undertaken several measures. These measures have also been favoured by the implementation of the new accounting standards and the Solvency II project whose introduction is currently scheduled by 2010. Among the risk mitigation actions, there has been a significant increase in both the share of bonds in total assets and the cutting back of equity, especially in the life insurance sector. Regarding pension funds, the magnitude of such risk rebalancing has been more modest, owing to the nature of their liabilities.<sup>4</sup> To deal with the problem of underfunding,

2 Modified duration is a yardstick of the sensitivity of a bond portfolio's value to a small change in interest rates. This relation is typically not proportional, and convexity measures this aspect of the price-yield relationship.

3 In accordance with IAS 19, pension funds may now be required to use a high-quality corporate bond yield – typically AA or equivalent – in some jurisdictions. However, for the majority of European companies, whose average is triple B, using AA yield-based discount rate may lead to an overestimation of the true corporate pension deficit. In other countries, such as Germany, where the discount rate is fixed by the authorities and rarely changed, potential concerns in terms of underfunding may arise with the future implementation of new accounting standards in the pension fund industry.

4 The liabilities of life insurers have historically tended to be defined in nominal terms, owing to the offered guaranteed return that is fixed in money terms. Liabilities of pension funds, on the other hand, are denominated in real terms, as these grow in tandem with wage increases. Indeed, the replacement ratio is typically indexed on final earnings in defined benefit schemes. Defined benefit pension funds are therefore used to hold real assets such as property and equities to match liabilities of a higher proportion than that observed in life insurers' typical investment portfolios.

pension funds have adopted a variety of solutions, such as requiring higher contributions, reducing benefits, or ultimately accelerating the move towards defined contribution pension schemes or hybrid plans, thereby transferring (at least partially) financial and longevity risks to employees. In the life insurance industry, the persistently low yield environment has prompted the reduction of guaranteed return on traditional saving products. This has eased pressures on profitability, albeit to a small extent as this reduction only applies to new contracts sold; indeed the bulk of traditional products have continued to offer higher guaranteed rates. The low-yield environment has also made traditional saving products with reduced guaranteed returns less attractive. This has benefited a new type of instrument, the so-called unit or index-linked product (see Chart B17.3). Such products are typically indexed to stock indexes, and the investment risk is borne by the policyholders. In both cases, the low-yield environment has contributed to the continuous and increasing transfer of risk from the balance sheets of life insurance companies and pension funds to the household sector, although an ageing euro area population, together with lower expected returns from stock markets compared with the 1990s, remains the main factor in the straining of balance sheets of defined benefit pension schemes.

Turning to the sources of risks and vulnerabilities within the industry, an important risk for the non-life and reinsurance sector is the traditional cyclicality of the business. As there are indications that premium prices may have peaked in both sub-sectors, the industry may face the risk that premium prices could decline below levels that would ensure adequate risk pricing in underwriting. However, there are several factors that might mitigate this risk. If long-term yields on euro area bonds remain low, this will weigh on investment income, thereby mitigating the risk of a sharp fall in premium prices in the non-life and reinsurance sectors. In addition, most euro area reinsurers have announced that they will favour meeting ROE targets in the period ahead rather than seeking to expand their market shares by lowering premium prices. Liability management is also likely to come under tighter control in the run-up to Solvency II. Finally, Hurricane Katrina may, as a unique event, result in significant losses, and could therefore dampen downward pressures on reinsurance prices. With current insured loss estimates in the USD 40-60 billion range, 2005 may prove the costliest year yet for the reinsurance sector as a whole.<sup>11</sup> Regarding the euro area reinsurance industry the losses incurred appear rather more contained at slightly more than USD 1 billion.

A risk facing the reinsurance sector is related to the so-called finite risk reinsurance business. Finite risk reinsurance may be broadly defined as reinsurance agreements that suppose a certain level of risk transfer from the primary insurers to the reinsurer, but which limit the reinsurer's risk exposure to a maximum amount.<sup>12</sup> This allows companies to smoothen their earnings by transferring current losses into future periods. This may sustain the firm's capital base for long periods of time, but could also distort financial statements. In October 2004, the office of the New York attorney-general began a probe into allegations that finite risk reinsurance may have been used to manipulate financial accounts. The actions undertaken by prosecutors should determine whether the required risk transfer levels have been properly respected and whether certain transactions were engineered with the aim of falsifying financial accounts. From a financial stability viewpoint, an improvement in the

<sup>11</sup> However, the amounts of losses are still insufficient to trigger hurricane-related catastrophe bonds issued by insurers to protect themselves against capital depletion arising from peak risks. A significant part of the current estimated losses – USD 15-25 billion – is related to flooding in New Orleans. Flood insurance is provided by the National Flood Insurance Program and will therefore not be incurred by the insurance industry.

<sup>12</sup> From an accounting viewpoint, if the degree of risk transfer is insufficient, then the transaction is considered as a financing mechanism and is booked as a loan or liability instead of as an asset.

transparency of financial statements resulting from these investigations should be positive. However, it may weigh on the profitability of the reinsurance sector in the period ahead and reduce the flexibility of primary insurers to manage their capital efficiently.

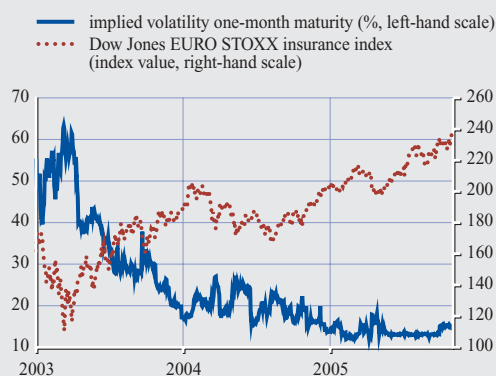
There are some risks related to the run-up to the implementation of Solvency II that are connected to the consequences of possible changes in the financing sources of insurers. On one hand, attempts at reducing double leverage in balance sheets between holding groups and their subsidiaries may weigh on ROE in the period ahead.<sup>13</sup> On the other hand, in order to face the new regulatory environment and, to a certain extent, to circumvent these downward pressures on ROE, insurers may choose to rely heavily on subordinated debt issuance. Indeed, it seems likely that the new Solvency II regulation will allow more subordinated debt to be accounted for as regulatory capital than is currently permitted by most countries of the euro area.<sup>14</sup> Stated ROE may be boosted by subordinated debt issuance owing to increased financial leverage. The potential negative impact on funding spreads could impinge on the capital funding of the most poorly capitalised companies, i.e. those with only limited or no access at all to equity markets. This could prove problematic in an environment of relative shortage of risk-finite reinsurance and of widening spreads.

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

Assessment of the euro area insurance outlook through market-based indicators does not provide a homogeneous picture. On one hand, the strong performance of the largest listed insurance companies since May 2005 has tended to reflect rising investor confidence in the capacity of the sector to show an improvement in earnings in the period ahead. Expectations of improving financial conditions were surrounded by a very low degree of uncertainty (see Chart 5.6).

**Chart 5.6 Dow Jones EURO STOXX insurance index and its implied volatility**

(Jan. 2003 - Nov. 2005)



Source: Bloomberg.

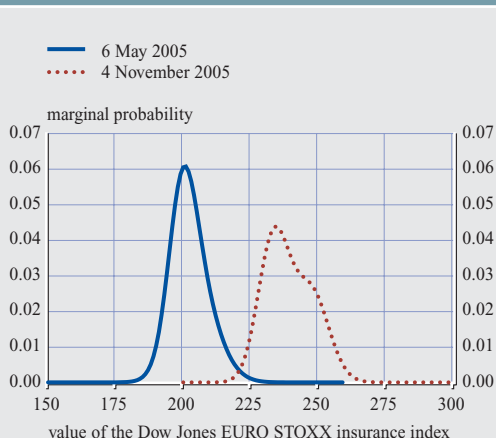
Note: The Dow Jones EURO STOXX insurance index comprises the 19 largest insurance companies in the euro area. The implied volatility is the average of the volatility extracted from call and put option prices with a delta equal to 0.5.

While equity market-based indicators and expected default frequencies have shown perceptions of declining risk in the insurance sector, patterns in subordinated debt spreads, which widened after March 2005, point towards the perception of rising risk (see Chart S68). The RND became somewhat flatter in early November compared to May, reflecting a higher dispersion of expectations among market participants regarding the future value of the insurance stock index. By early November, the likelihood of an abnormally large decline was priced by market participants as being smaller than that of a large increase (see Chart 5.7).

<sup>13</sup> The new regulation – planned to be introduced in 2010 – is expected to apply at both the holding group and subsidiary levels. It should therefore reduce the incentive for double leverage, a situation whereby the holding company issues senior debt and transfers part of the proceeds to subsidiaries in the form of subordinated debt. As double leverage is significant in the insurance sector, any reduction may tend to put downward pressure on ROE.

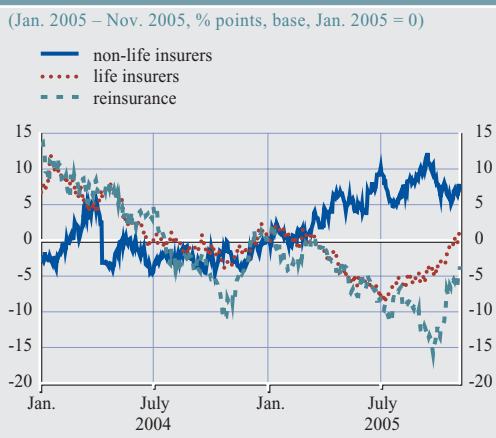
<sup>14</sup> Current regulations often allow subordinated debt to account for up to 50% of the required minimum margin. However, as most insurance companies operate with higher levels of capital than the minimum regulatory requirement, subordinated debt currently accounted de facto for a smaller part of capital – less than 25%.

**Chart 5.7 Risk-neutral probability density function on the Dow Jones EURO STOXX insurance index**



Sources: Bloomberg and ECB calculations.

**Chart 5.8 Cumulative change in the euro area insurance stock price indices relative to the Dow Jones EURO STOXX**



Source: Thomson Financial Datastream.

For the insurance industry sub-sectors, different patterns can be identified in the performance of stock prices. The life insurance stock index underperformed the EURO STOXX index in the first half of the 2005 but outperformed thereafter (see Chart 5.8). The challenging low interest rate environment and to a lesser extent the need to revise reserves upwards to face revisions in longevity risk assessment has led life insurers to retain profits rather than distributing dividends since 2002. However, the strong financial results of euro area life insurers released in mid 2005 boosted stock prices in the second half of the year.

Regarding the reinsurance industry, the worst-performing segment of the entire insurance sector until mid-September 2005, one driving factor appears to have been reluctance on the part of companies to return excess capital to shareholders. The reinsurers' decision to fund reserves rather than target some level of ROE has therefore not been welcomed by investors. The US investigations into finite risk reinsurance may also have weighed on reinsurance stock prices. Finally, from mid-September 2005, the outperformance of the reinsurance stock index became more pronounced. This may possibly be explained by expectations of international investors of a

flight from primary insurers towards euro area reinsurers rather than US competitors after Hurricane Katrina. The announcement of ROE targets by most euro area reinsurers may also have played a role.

In the non-life insurance industry, stock prices continued to outperform the EURO STOXX in 2005, despite the position in the cycle of premium prices, which usually indicates the start of a period of deteriorating underwriting profits. Three reasons can be offered in explanation for the strength of stock prices in this sub-sector. First, share prices are forward-looking and have therefore already anticipated the impact of an impending decline in policy prices. Second, firms sent clear signals to investors regarding targeted levels for combined ratios and ROE. Third, generous cash dividends and buybacks in this sector have been viewed as a sign of management confidence in the positive outlook regarding underwriting results.

### 5.3 OVERALL ASSESSMENT

The outlook for the euro area insurance sector remains favourable, although some risks can still be identified, mainly relating to uncertainties about the likely future path of euro area long-term interest rates.



The prospects for the life insurance industry in the euro area have improved. Decisions taken by some Member States to offload pension funding from the fiscal budget are likely to shift more pension business to the life insurance industry. Hence, growth in the sale of life policies is expected to pick up gradually in the future.

The outlook for the non-life industry in the euro area also appears broadly positive. The risk of a significant decline in premium prices appears contained in the period ahead, as investment income should remain modest given the current low investment return environment. Growth in premium written should expand further with economic recovery.

In the reinsurance sector, underwriting results in 2005 are likely to be strong, with premium prices declining only slowly. In the period ahead, owing to important claims from Hurricane Katrina, reinsurance premium prices may halt declining and possibly even increase slightly, depending on the final amount of capital depletion in the sector worldwide. In the euro area, the losses incurred by reinsurers from the hurricane are expected to only dent capital positions.

## 6 STRENGTHENING FINANCIAL SYSTEM INFRASTRUCTURES

*Key financial infrastructures – including payment systems, such as TARGET, and securities clearing and settlement systems – remained robust and continued to facilitate a smooth allocation of financial resources. This section also reports on the oversight of SWIFT and the ECB's adoption of an oversight framework for retail payment systems operating in euro. With regard to securities clearing and settlement systems, no further consolidating operations have been reported over the last six months, as has indeed been the case since the launch of the euro. This section also discusses the CPSS-IOSCO Recommendations for Central Counterparties, which explicitly aim at strengthening financial stability.*

### 6.1 PAYMENT SYSTEMS

Any events which could adversely impact on the smooth functioning of payment systems, particularly large-value interbank fund transfer systems, are undesirable from a financial stability perspective. Examples of such events include insolvency or liquidity problems of one or more system participants, or deficiencies in information systems. If such events do materialise, they might, in a best-case scenario, “only” lead to minor disruptions. However, if they are severe enough and/or contagious, they could have an impact on other system participants, other market infrastructures and their participants, and financial markets on a wide scale, possibly leading to broad and negative implications for the economy or currency area as a whole. As a corollary, it is of the utmost importance that payment systems are designed, operated and overseen in the most prudent manner. Whereas the design and operation of individual payment systems lies with the operators of those systems, central banks have the responsibility for overseeing that systems which can transmit systemic disruptions comply with the Core Principles for Systemically Important Payment Systems (“the Core Principles”).

Oversight of payment systems, especially systemically important payment systems such as TARGET and EURO1, is one of the Eurosystem's main tasks. It is worthwhile emphasising that it is the Eurosystem's oversight policy to conduct oversight not only on the operation of payment systems, but also on the design of payment systems with a view to contributing to the compliance of these systems with all relevant Core Principles from the outset. This therefore also contributes to long-term financial stability.

### SETTLEMENT OF LARGE-VALUE PAYMENTS IN EURO

The Eurosystem encourages large-value payments in euro to be settled safely in systems that use central bank money as the settlement asset, thereby contributing to the stability of the euro area financial system. Market participants have so far responded positively to this encouragement. Among the four euro large-value payment systems operating in the euro area, the TARGET system is the one that is most frequently used to settle, for instance, money market transactions or the cash leg of securities transfers.<sup>1</sup> TARGET, which commenced operations on 4 January 1999, has become the payments backbone of the euro area. In 2005, the volumes and values of payments settled via TARGET grew still further (see Chart 6.1). Over the six months since the last Review (between April and September 2005), the system settled an average daily value of €1,878 billion.

EURO1 is the second most important euro large-value payment system both in terms of value and volume, although it is positioned a long way behind TARGET. Between April and September 2005, it settled an average daily value of €165.2 billion.

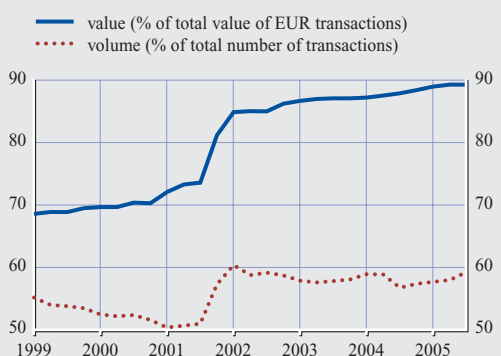
### RECENT DEVELOPMENTS IN TARGET

Over the six months since the last Review (from April to September 2005), the five largest national real-time gross settlement

<sup>1</sup> The other systems are the pan-european EURO1 system, the PNS system in France, and the POPS system in Finland.

**Chart 6.1 Large-value payments processed via TARGET**

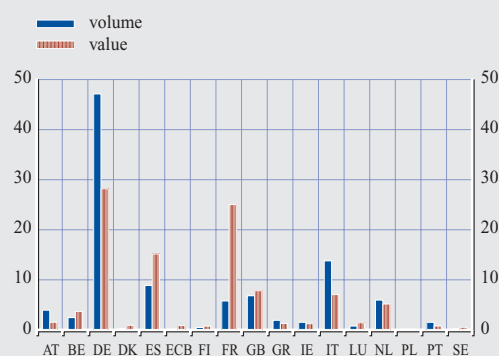
(Q1 1999 - Q3 2005)



Source: ECB.

**Chart 6.2 Large-value payments processed via TARGET by country**

(Apr. 2005 - Sep. 2005, % of the NCBS'/ECB's share in terms of value and volume)



Source: ECB.

systems (RTGS) that are part of the TARGET system had a collective share of 82.1% in terms of volume, (those of Germany, Italy, Spain, United Kingdom and The Netherlands) and 82.8% in terms of value (the first four countries and France) of all transactions sent via TARGET (see Chart 6.2). Given their collective importance, it is imperative that these systems are particularly reliable in order to ensure that they do not adversely affect the smooth functioning of TARGET as a whole.

#### FUTURE DEVELOPMENTS IN TARGET

The TARGET2 system will replace the current TARGET system in November 2007, as discussed in the December 2004 FSR. Despite the complexity of the TARGET2 project, the design of the new system has been progressing well. As with any other euro large-value payment system in the euro area, TARGET2 will have to comply with the Eurosystem's oversight standards. As part of the TARGET oversight function, a comprehensive preliminary oversight assessment of TARGET2 in its design phase is planned in the coming months. The results of these oversight activities with regard to TARGET2 will be published in a future edition of the FSR.

In March 2005, the ECB Governing Council approved the connection of the new Polish euro RTGS system SORBNET-EURO, operated by Narodowy Bank Polski, to the current TARGET system.<sup>2</sup> A further enlargement of the current TARGET system is expected to take place in light of the planned adoption of the euro by some of the new EU Member States in 2007. From a financial stability perspective, any connection of RTGS systems to the current TARGET system requires the proven systemic stability of the TARGET system to be fully maintained. Therefore, these new TARGET components – as well as all other systemically important infrastructures in countries intending to operate in euro – will be subject to oversight assessments in accordance with the Eurosystem's common oversight policy. The ECB and all relevant NCBS will carry out these oversight assessments in the coming months, and the results will be covered in a future issue of the FSR.

#### CONTINUOUS LINKED SETTLEMENT (CLS)

The Continuous Linked Settlement (CLS) system aims at substantially reducing foreign exchange (FX) settlement risk by settling both legs of FX transactions simultaneously as soon

<sup>2</sup> For more details, see ECB (2005), *Financial Stability Review*, June.

as sufficient funds are available. This multi-currency system settles a significant number of transactions in euro, and is, in terms of value, the second-largest payment system settling euro transactions after TARGET (notably exceeding the value of transactions settled through EURO1). The functioning of CLS is of interest to the Eurosystem because instabilities in the CLS system could have systemic implications for the euro area.

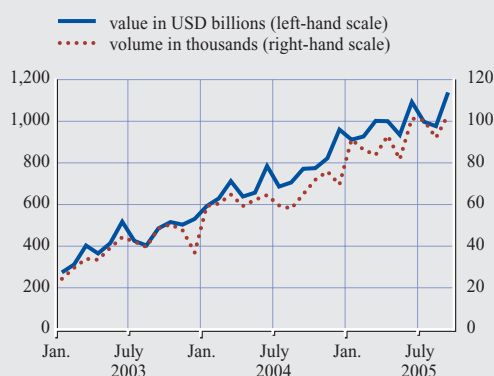
In 2005, the settlement values of FX transactions processed via the CLS system rose further (see Chart 6.3). In September 2005, CLS settled the equivalent of USD 2.3 trillion, thus eliminating FX settlement risk equivalent to USD 2.2 trillion. The euro values settled via CLS amounted to €378 billion in September 2005, eliminating FX settlement risk of approximately €360 billion.

### SWIFT

S.W.I.F.T. SCRL, the Society for Worldwide Interbank Financial Telecommunication (henceforth simply SWIFT), is a limited liability cooperative company owned by its members. In addition to providing secure messaging services to more than 7,500 financial institutions, SWIFT is also actively engaged in the message standardisation process. SWIFT cooperates with its user community in order to refine existing message types and thus to implement message standards for new types of transactions or other financial information needs.

**Chart 6.3 Volumes and values of foreign exchange trades settled via CLS in USD billion equivalent**

(Jan. 2003 - Sep. 2005)



Source: ECB.

The Group of Ten (G10) central banks perform oversight on SWIFT in a cooperative way. This is due to the importance of SWIFT as a network service provider for most of the systemically important payment and securities clearing systems, as well as their participants.

In 2004, the G10 central banks agreed on the need to strengthen practical oversight arrangements (see Box 18). However, the two core concepts in the initial set-up of the oversight of SWIFT have remained valid, i.e. the concept of cooperative oversight with the Nationale Bank van België/Banque Nationale de Belgique (NBB) as lead overseer, and the concept of moral suasion to induce changes.

### Box 18

#### THE OVERSIGHT OF SWIFT: OBJECTIVES, SCOPE AND STRUCTURE

The oversight of SWIFT focuses on the security, operational reliability, business continuity and resilience of the SWIFT infrastructure. The oversight activities performed by central banks aim at ensuring that SWIFT has in place appropriate governance arrangements, structures, processes, risk management procedures and controls that enable it to manage effectively the risks it may pose for financial stability and the soundness of financial infrastructures. This oversight does not grant SWIFT any certification, approval or authorisation, and SWIFT continues to bear responsibility for the security and reliability of its systems, products and services.

Given that SWIFT is incorporated in Belgium, the NBB is the lead overseer. It conducts the oversight of SWIFT in cooperation with other central banks. Currently, these comprise the ECB and the following G10 central banks: the Bank of Canada, the Deutsche Bundesbank, the Banque de France, the Banca d'Italia, De Nederlandsche Bank, the Bank of Japan, Sveriges Riksbank, the Swiss National Bank, the Bank of England, and the US Federal Reserve System, represented by the Federal Reserve Bank of New York and the Board of Governors of the Federal Reserve System. The NBB and SWIFT have formalised this oversight relationship in a protocol arrangement. The relationship between the NBB and the other cooperating central banks in relation to participation in the oversight of SWIFT has been laid down in bilateral Memoranda of Understanding (MoUs) between the NBB and each of those central banks.

The SWIFT oversight structure comprises of two senior-level groups and a technical oversight group:

- i) The SWIFT Cooperative Oversight Group – which is composed of all G10 central banks, the ECB and the chairman of the G10 Committee on Payment and Settlement Systems – is the forum through which central banks conduct cooperative oversight of SWIFT and, in particular, discuss oversight strategy and policies related to SWIFT.
- ii) The Executive Group is composed of only five Oversight Group members: the Bank of Japan, the Federal Reserve Board, the Bank of England, the ECB and the NBB. On behalf of the Oversight Group, it discusses with SWIFT's board and management the central banks' oversight policy, any issues of concern, SWIFT's strategy regarding oversight objectives, and conclusions.
- iii) At the technical level, the Technical Oversight Group carries out the technical preparatory work for the oversight of SWIFT and reports its findings and recommendations to the Oversight Group.

#### **OVERSIGHT ASSESSMENT OF RETAIL PAYMENT SYSTEMS**

In August 2005, the Eurosystem finalised the assessment of 15 euro retail payment systems

that fall within the scope of its oversight policy on retail payment systems (see Box 19).

#### **Box 19**

##### **THE OVERSIGHT OF RETAIL PAYMENT SYSTEMS**

The Eurosystem's task of promoting the smooth operation of payment systems consists of ensuring the safety and efficiency of payment systems and the security of payment instruments. In pursuing this objective, to start off with, the Eurosystem concentrated on large-value payment systems, as these systems were regarded as the most relevant for financial stability in the euro area. However, turnover data for euro retail payment systems suggested that some of these systems had likewise reached a size, and thus relevance, where disruptions could trigger systemic risks.

Therefore, in June 2003 the Governing Council of the ECB adopted an oversight framework for retail payment systems operating in euro. It is important to note that this oversight framework is intended to ensure that retail payment systems cannot become vectors of systemic risks or economic malfunctioning in the euro area. The framework contained criteria for classifying retail payment systems into three different categories: systemically important retail payment systems (SIRPS), prominently important retail payment systems (PIRPS), and “other retail payment systems”. The decisive factor in defining the classification criteria was the degree of disruption that a malfunctioning in one of these systems could cause in the financial markets and/or the economy in general.

The distinguishing feature of a SIRPS is that it can trigger severe disruptions or transmit shocks across the financial system. The main determinants in this respect are the value and the nature of the payments that the system processes. A payment system is likely to be of systemic importance if at least one of the following is true: (i) it is the only payment system in the country, or the principal system in terms of the aggregate value of payments; (ii) it mainly handles payments of high individual value; and/or (iii) it is used for the settlement of financial market transactions or the settlement of other payment systems. If the disruption of a retail payment system could threaten the stability of financial markets, the system is considered to be of systemic importance (i.e. a SIRPS). With regard to the criteria for a retail payment system being classified as a SIRPS, the Eurosystem took into account three factors: the market penetration within the respective retail payment market, the financial risks pertinent to the system, and the risk of a domino effect. The following three quantitative indicators are used in this respect:

- a market share of more than 75% of the respective retail payments market, i.e. the payments processed via interbank retail payment systems and via other payment arrangements (“market penetration”);
- a processing of payments of more than 10% of the value of the national RTGS system or a processing of payments with an average daily value of more than €10 billion (“aggregate financial risk”); and
- a concentration ratio (i.e. the market share of the five largest participants) of 80%, or a netting ratio of 10% or less, or a net debit position of participants of at least €1 billion (“the risk of a domino effect”).

Any systems fulfilling all of these criteria were considered to be SIRPS.

If the disruption of a retail system does not have systemic implications, but could nonetheless have a severe impact, such a system is considered to be of prominent importance for the functioning of the retail economy (i.e. a PIRPS). PIRPS are characterised by the fact that they play a prominent role in the processing and settlement of retail payments, and that their failure could have a major economic impact that could undermine the confidence of the public in payment systems and in the currency in general. In seeking to classify PIRPS, the focus was therefore on the concentration of the retail payments market and, in particular, the degree of market penetration of the respective system, on the basis of the following quantitative indicator:

– a market share of more than 25% of payments processed in the respective retail payments market, i.e. the payments processed via interbank retail payment systems and via other payment arrangements.

There are other retail payment systems that do not belong to either of the two previous categories. These systems have a lesser impact on the financial infrastructure and the real economy and therefore do not necessarily have to comply with the Core Principles or the Retail Standards. However, such systems do have to comply with the relevant oversight standards, as and if defined for them. Examples in this respect are the common oversight standards for e-money schemes and the standards defined at the national level by each NCB.

It was decided that euro retail payment systems have to comply with different sets of standards depending on their classification. SIRPS have to comply with the whole set of Core Principles, while PIRPS have to observe a sub-set of the Core Principles, namely Core Principles I, II, and VII to X. The oversight standards for other systems were not however further harmonised, and these other systems continue to be assessed against any applicable standards determined by the relevant overseer.

The Eurosystem's overseers identified 15 euro retail payment systems which either take the form of an automated clearing house (ACH) or a multilateral interbank agreement, and therefore fall within the scope of the Eurosystem's policy on retail payment systems. Six of these systems were classified as SIRPS, seven as PIRPS, while two fell into the category of "other systems". Subsequently these systems were assessed against the applicable Core Principles. The results of this assessment have been made available on the ECB website.

The assessment reports prepared by the national overseers reflected the status of the systems as at end-June 2004. Two systemically important retail payment systems (SIRPS), LIPS-Net and PMJ, and one prominently important retail payment system (PIRPS), STEP2, observed all relevant Core Principles.<sup>3</sup> The assessment of the other systems revealed shortcomings with respect to one or more Core Principles. In general, the level of observance was better for the SIRPS than for the PIRPS.

All SIRPS observed Core Principles IV (Prompt final settlement), VI (Settlement assets), VIII (Efficiency), IX (Access criteria) and X (Governance). The shortcomings of the SIRPS were concentrated in the areas of Core Principles I (Legal basis), III (Management of financial risks) and V (Settlement in multilateral netting systems).

For the PIRPS, the observance of the Core Principles and shortcomings was more uneven, with a certain concentration of shortcomings in the area of legal soundness (Core Principle I).

A number of shortcomings identified during the assessment process were immediately addressed by the respective system operators, sometimes in cooperation with the relevant overseer. Therefore the status after finalising the assessments has already improved since the start of the assessment process. The system owners are expected to remedy the remaining shortcomings in a timely manner.

<sup>3</sup> See BIS (2001), "Core Principles for Systemically Important Payment Systems", January.

## 6.2 SECURITIES CLEARING AND SETTLEMENT SYSTEMS

The European securities and derivatives clearing and settlement infrastructure is characterised by ongoing changes that are mostly the result of consolidation activities and the expansion of activities of central counterparty clearing houses (CCPs). CCPs, while traditionally most active in derivatives and repo markets, are now increasingly to be found serving outright securities<sup>4</sup> markets as well. Such developments can have an effect on risks for financial stability and must therefore be monitored closely.

### EXPANSION OF CCPs' ACTIVITIES

CCPs have been expanding into new business activities, with an increasing number of CCPs now also serving outright securities markets (see Table 6.1). As reported in the June 2005 FSR, the

latest example is in Austria, where the CCP operated by the Vienna Stock Exchange was abolished and its activities were transferred to the newly created "CCP Austria", a 50% subsidiary of the Vienna Stock Exchange and the Austrian central securities depository (CSD) OeKB respectively, in January 2005. On this occasion, it was decided that the new CCP should clear not only derivatives, but also all cash market transactions of the Vienna Stock Exchange.

As CCPs have the potential to reallocate risks in financial markets in an efficient way, provided that they manage their own risks adequately, this trend might contribute to financial stability (see also Special Feature F on "Central counterparty clearing houses and financial stability").

<sup>4</sup> An outright securities transaction is a transaction whereby securities are bought and sold outright in the spot market.

Table 6.1 Euro area CCPs for financial instruments

Country	January 1999	December 2005
Belgium	BELFOX (derivatives)	none
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, gov. bonds, derivatives on debt instruments) MEFF Renta Variable (derivatives on equities) <sup>1)</sup>
France	Bourse de Paris (SBF) (equities and options)  Matif (derivatives; subsidy of SBF) Clearnet (repos, gov. 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 and EuroMTS)
Luxembourg	none	none
Netherlands	Effectenclearing (securities) EOCC (derivatives)	none
Austria	Vienna Stock Exchange (derivative)	CCP Austria (derivatives, securities)
Portugal	BVLP (derivatives)	none
Finland	HEX (derivatives)	none

Source: ECB (2005).

1) MEFF Renta Fija and MEFF Renta Variable belong to the same holding company.



## INTERNATIONAL STANDARDS AND RECOMMENDATIONS

Clearing and settlement is increasingly an international activity, and it has therefore been recognised that regulatory and oversight efforts in this field may also require international coordination and cooperation. A joint task force of the Committee on Payment and Settlement Systems (CPSS) of the central

banks of the G10 countries and the Technical Committee of the International Organization of Securities Commissions (IOSCO) published recommendations for securities settlement systems (SSSs) in 2001, and for CCPs in 2004. These CPSS-IOSCO recommendations explicitly aim at strengthening financial stability (see Box 20).

### Box 20

#### THE CPSS-IOSCO RECOMMENDATIONS FOR CENTRAL COUNTERPARTIES

In November 2004, the CPSS of the central banks of the G10 countries and the Technical Committee of IOSCO published a report entitled “Recommendations for Central Counterparties”, which contains 15 recommendations for CCP clearing houses. Most of the recommendations aim at reducing risks that CCPs may be exposed to. As CCPs are systemically important institutions for the financial markets that they serve, these recommendations also contribute to strengthening financial stability. This Box briefly describes some of the aspects addressed by the recommendations with respect to the most important risks faced by CCPs that are particularly relevant from a financial stability perspective.<sup>1</sup>

#### Counterparty credit and liquidity risks

The most important types of risk for a CCP are counterparty credit risk and liquidity risk. Counterparty credit risk is the risk that a CCP participant cannot fulfil an obligation to deliver assets to the CCP, typically due to insolvency. Liquidity risk is the risk that the participant cannot fulfil such an obligation in time, but only at a later stage, for example owing to operational problems.

Recommendation 2 advises CCPs to select their participants carefully. In particular, participants should fulfil adequate capital requirements and should have robust operational facilities in place to ensure timely settlement of obligations.

Recommendation 2 aims at reducing the risk that a CCP participant could fail to fulfil an obligation towards the CCP. Other recommendations aim at ensuring that the CCP will not itself fail to fulfil its own obligations even if its participants fail to fulfil their obligations towards the CCP. Recommendation 10, for example, asks CCPs to use delivery-versus-payment (DVP) facilities to settle transactions with its participants. DVP implies that assets are transferred from the seller to the buyer if and only if the payment is transferred from the buyer to the seller. If, for example, the CCP is the seller to a defaulting participant and DVP is not used, then the CCP is in danger of delivering the assets to the participant without receiving payment, i.e. the CCP risks losing the full principal value of the assets. Recommendations 3, 4 and 5 urge CCPs to have adequate and sufficiently liquid financial resources available, in particular collateral posted by CCP participants, so that the CCP can be used in case of default

<sup>1</sup> For additional information, see Special Feature F on “Central counterparty clearing houses and financial stability” in this FSR.

by participants. It should be noted, however, that a CCP incurs liquidity risk even when all participants pay or deliver in time, as there is not always an obligation for CCP participants to pay or deliver at the same moment, for instance because of a lack of DVP during settlement.

#### **Settlement bank risk and custody risk**

CCPs use various settlement service providers to settle transactions with their participants. They use settlement banks to settle payment obligations. Payments are transferred from a participant's cash account with the settlement bank to the CCP's cash account or vice versa. Settlement bank risk is the risk that the settlement bank could fail. As cash on the CCP's cash account is a liability of the settlement bank towards the CCP, the CCP may lose up to the full amount of cash on such an account if the settlement bank fails. In addition, the CCP would need to appoint a new settlement bank, a process that may delay clearing activities. It is therefore advisable, as per Recommendation 9, that the CCP carefully selects its money settlement arrangements. In particular, the use of central banks is suggested.

Similarly, CCPs use CSDs and custodians to hold and settle other assets, for example securities posted to the CCP as collateral. Custody risk is the risk that assets could be lost while held on accounts with CSDs or custodians. Recommendation 7, among others, emphasises that these assets should be protected against the claims of creditors of the CSD or custodian.

#### **Investment risk**

CCPs typically invest their own financial resources and cash posted by their participants as collateral in one way or another. Again, Recommendation 7 emphasises the need to invest in sound assets so as to limit the losses the CCP could incur from its investment strategies. Moreover, financial resources should be invested in relatively liquid assets to enable the CCP to make swift use of these resources in case of urgent need.

#### **Operational risks**

CCPs, CCP participants, and the CCPs' settlement banks, CSDs and custodians use a variety of technical systems that must not be prone to operational problems. Recommendation 8, dealing with operational risks, explains that all systems involved should be reliable and secure and should have adequate capacity. Furthermore, business continuity arrangements should be in place to permit a timely resumption of activities.

#### **Legal risks**

Finally, Recommendation 1 addresses legal risks. The legal framework should be well-founded and transparent. With a view to cross-border clearing activities as well, Recommendation 1 furthermore emphasises the need for the legal framework to be enforceable in all relevant jurisdictions.

In October 2001, the ESCB and the Committee of European Securities Regulators (CESR) set up a joint working group to design new standards for securities clearing and settlement systems with the aim of deepening and strengthening the CPSS-IOSCO recommendations in the

European context. In October 2004, the Governing Council of the ECB and CESR in principle approved a ESCB-CESR working group report with 19 standards.<sup>5</sup>

5 See ECB (2005), *Financial Stability Review*, June, Box 18.





## IV SPECIAL FEATURES

### A MEASUREMENT CHALLENGES IN ASSESSING FINANCIAL STABILITY<sup>1</sup>

*Financial stability assessment as currently practised by central banks and international organisations probably compares with the way monetary policy assessment was practised by central banks three or four decades ago – before there was a widely accepted, rigorous framework. The measurement challenges that lie ahead for financial stability assessment are formidable. However, it is important to acknowledge that significant progress has been made in recent years. Even though there is no obvious framework for summarising developments in financial stability in a single quantitative measure, a growing number of central banks around the world are making financial stability assessments and publishing financial stability reports, many of them based on a broad and forward-looking conception of financial stability.*

#### INTRODUCTION

Financial stability is a difficult concept to define. Although it is often seen only from the perspective of avoiding financial crises, it also has a positive dimension. It is a condition where the financial system is capable of performing well all of its normal tasks and where it is expected to do so for the foreseeable future. From this viewpoint, financial system stability requires the principal components of the system – including financial institutions, markets and infrastructures – to be jointly capable of absorbing adverse disturbances. It also requires that the financial system is facilitating a smooth and efficient allocation of financial resources from savers to investors, that financial risk is being assessed and priced reasonably accurately and that risks are being efficiently managed. Financial stability also has an important forward-looking dimension: inefficiencies in the reallocation of capital or material shortcomings in the pricing of risk can, by laying the foundations for future vulnerabilities, compromise future financial system stability and, therefore, economic stability.

There are three important aspects to producing a comprehensive assessment of financial stability. The first entails forming a judgement about the individual and collective strength and robustness of the constituent parts of the financial system – institutions, markets and infrastructures. The second involves systematically identifying the plausible and (systemically) important sources of risks and vulnerabilities that could pose challenges to financial stability in the future. The third is an appraisal of the potential costs – that is, the ability of the financial system to cope – should some combination of these identified risks and vulnerabilities materialise. In practice, this requires an ability to measure (and model) strength and robustness, or to calibrate the plausibility and importance of the various risks, or to appraise quantitatively the potential costs should risks materialise. However, each of these areas entails formidable measurement and modelling challenges, so much so that in practice many shortcuts and qualitative judgements must be made to produce an overall assessment. This Special Feature is the companion to a Special Feature in the last issue of this Review, and discusses some of the main measurement challenges involved in practical financial stability assessment.<sup>2</sup>

The rest of this Special Feature is organised as follows. Section 2 discusses some of the practical challenges involved in implementing a framework for financial stability assessment. It outlines criteria for disciplining the process of information gathering, monitoring and assessing, and it highlights the formidable measurement challenges faced. Section 3 briefly outlines some of the immediate and difficult challenges that lie ahead in both assessing and safeguarding financial stability. Finally, Section 4 briefly draws some conclusions.

<sup>1</sup> This special feature draws heavily on J. Fell and G. Schinasi (2005), “Assessing Financial Stability: Exploring the Boundaries of Analysis”, *National Institute Economic Review*, No 192, April, pp. 102-117.

<sup>2</sup> See ECB (2005), “Assessing financial stability: Conceptual boundaries and challenges”. *Financial Stability Review*, June, pp. 117-125.

## PRACTICAL CHALLENGES IN IMPLEMENTING A FRAMEWORK FOR FINANCIAL STABILITY ASSESSMENT

### DISCIPLINING THE PROCESS OF ASSESSMENT

One of the objectives of any financial stability assessment should be to determine whether the financial system can be judged to be either in a zone or corridor of financial stability, as approaching a boundary of stability/instability, or outside a zone or corridor of stability. Within the third category, the financial system could be further judged to be in a position in which self-corrective processes and mechanisms are assessed as being likely to move the system back towards the corridor of stability or, alternatively, need prompt remedial and even emergency measures to reverse the instability.

While categories of possible assessments may be straightforward to discuss in principle, they are difficult to identify in practice. How should the boundary of stability be defined and measured, for example? When does an isolated small problem threaten to become a systemic one? There would also seem to be a bias towards being prudent and overreaching in identifying potential sources of risks and vulnerability and therefore towards overestimating their likelihood and importance. Thus, it would be useful to establish some ground rules or guidelines which could discipline the continuous process of information gathering, analysis, and monitoring; and, most importantly, to identify sources of risks and vulnerabilities. A checklist of disciplining principles for identifying risks and vulnerabilities and for assessing where along the stability spectrum the financial system might be could include the following:

- Is the process systematic?
- Are the risks identified plausible?
- Are the risks identified systemically relevant?
- Can linkages and transmission (or contagion) channels be identified?
- Have risks and linkages been cross-checked?

- Has the identification of risks and the assessment been time-consistent?

In practice, the process of assessing financial stability entails a *systematic* identification and analysis of the sources of risk and vulnerability that could impinge on stability in the circumstances in which the assessment is being made. For example, consider the comprehensive list of sources of risk in Table A.1 below.<sup>3</sup>

An operationally significant distinction is made between endogenous sources of risk that

<sup>3</sup> See A. Houben, J. Kakes and G. Schinasi (2004), "Framework for Safeguarding Financial Stability", *IMF Working Paper* 04/101.

**Table A.1 Sources of risk to financial stability**

Endogenous	Exogenous
<i>Institutions-based:</i> Financial risks Credit Market Liquidity Interest rate Currency Operational risk Information technology weaknesses Legal/integrity risk Reputation risk Business strategy risk Concentration risk Capital adequacy risk	<i>Macroeconomic disturbances:</i> Economic environment risk Policy imbalances <i>Event risk:</i> Natural disaster Policy events Large business failures
<i>Market-based:</i> Counterparty risk Asset price misalignments Run on markets Credit Liquidity Contagion	
<i>Infrastructure-based:</i> Clearance, payment and settlements system risk Infrastructure fragilities Legal Regulatory Accounting Supervisory Collapse of confidence leading to runs Domino effects	

Source: Houben, Kakes and Schinasi (2004).

are present within the financial system, and exogenous sources of risk. Defining the financial system broadly, endogenous sources of risk can arise either in financial institutions, or in financial markets, or in the infrastructures, or in any combination of these.<sup>4</sup> For instance, credit, market or liquidity risks may be present in financial institutions which, if they materialise, could hamper the process of reallocating financial resources between savers and investors. Financial markets can be a source of endogenous risk not only because they offer alternative sources of finance to non-financial sectors, but also because they entail systemic linkages between financial institutions, and more directly between savers and investors. Financial infrastructures are also an important endogenous source of risk, in part because they entail linkages between market participants as well, but also because they provide the institutional framework in which financial institutions and markets operate. Outside the financial system, the macroeconomic environment can be an exogenous source of risk for financial stability because it directly influences the ability of economic and financial actors (households, companies, and even the government) to honour their financial obligations. Financial stability assessments should entail a systematic and periodic process of monitoring of each of these sources of risk, both individually and collectively, taking into account cross-sector and also cross-border linkages.

Calling attention to the main sources of risk and vulnerability to financial stability does not necessarily aim at identifying the most likely future scenarios. Instead, it entails the identification of potential sources of risk and negative events, even if these are remote and unlikely. In order to preserve discipline in an exercise that essentially involves determining what could go wrong, a key consideration is the *plausibility* of the risks identified.

For example, an analysis of conditions in the household and corporate sectors might reveal

that a sizeable drop in the rate of output growth could, by significantly lowering income and profits, cause a notable rise in household and corporate loan default rates, and thereby threaten the smooth functioning of the financial system. However, if the constellation of economic fundamentals underpinning the pace of economic activity suggests that the likelihood of recession is very low, then such an assessment would carry limited value. Ideally, if the probability of a disruptive event occurring can be estimated reasonably, then the plausibility of a source of risk can be rigorously determined. In current practice, given data, measurement and methodological limitations (which will be discussed later), in most cases a ranking of the plausibility of the various risks identified must be based on qualitative judgements based on very limited information.

While it is desirable to consider seriously all plausible sources of risk to financial stability, it would also be desirable to distinguish sources that could prove to be *systemically relevant* from sources that are unlikely to prove costly. For example, the plausible risk of an asset market correction would be seen as relatively benign if, given the current conjuncture, it was judged to entail only a minor threat to the financial condition of the household, corporate and financial sectors. However, if the risk was judged to threaten the solvency of a significant portion of any one of these sectors, it could prove more costly from a systemic perspective. The challenge is to distinguish between those threats to financial stability that, should they crystallise, carry a high probability of a significant disruption to real economic activity, and those that are likely to prove self-correcting without having a material impact either on the level of activity or the process of resource allocation. As implied by the examples, the systemic relevance of a particular set of risks can be determined if a reasonable judgement – if not quantitative assessment – can be made about

<sup>4</sup> See G. J. Schinasi (2004), “Defining Financial Stability”, *IMF Working Paper*, No 04/187; and G. J. Schinasi (2005), *Safeguarding Financial Stability: Theory and Practice*, IMF, December.

the likely real economic costs, given the materialisation of the risks. Ideally, the expected losses (for example, ones resulting from the product of the probability of the event and the cost, given materialisation) could lead to a ranking of the importance of the various plausible risks identified. More realistically, formidable practical challenges remain in assessing and estimating the likelihoods of what are, typically, low probability events and in measuring the associated costs. As discussed later, costs are also difficult to estimate, but at least there is a history of financial events that could, in principle, allow potential costs to be calibrated.

Once plausible and relevant sources of risk and vulnerability to financial stability have been identified, it is important to avoid *partial equilibrium analysis*. For example, in calibrating the financial stability implications of the risk of a sharp drop in equity prices, the analysis would need to go far beyond its potential impact on financial markets, and additionally examine the implications for household balance sheets, future corporate funding, and so on. More generally, an internally consistent framework for financial stability analysis requires the linkages and channels of contagion within the financial sector to be identified, as well as those between the financial and non-financial sectors. Because a financial system is comprised of many parts (markets, institutions and infrastructure), the overall degree of financial stability will depend not only on the degree of stability of each of its constituent parts, but also on their linkages and channels of contagion. This calls for a comprehensive approach to collecting and processing information on all the important sectors of the economy and the financial system.

With regard to *cross-checking*, since the process of identifying sources of risk and vulnerabilities is to some extent contrarian, in the sense that it identifies what could go wrong, the burden of proof should arguably be higher than that required for predicting the most likely

outcome. Hence, financial stability analysis should involve sufficient cross-checking of the assessment by considering a sufficiently wide range of alternative analytical tools, models, and data sources – and importantly, should include a continuous dialogue with market participants.

Concerning *time consistency*, further discipline on the process of identifying risks and vulnerabilities can be achieved if the horizon over which a given risk is most likely to crystallise can be assessed. The empirical literature has shown that it can be a challenging, if not impossible, task to predict the timing of crises. This should not stand in the way of judging whether a given plausible source of risk has a near, medium or long-term likelihood of materialising. Doing this systematically and periodically for the same sets of risks can improve accountability in the process of financial stability assessment. Some risks may ultimately prove to be self-correcting without posing any systemic threat, and in such cases, it is important to understand the reasons why. If a “false signal” was sent because of a more orderly than predicted unwinding of an imbalance or because of a structural change, such as better risk management that strengthened the financial system and thereby mitigated the risk, then this information can serve to improve future assessment.

#### MEASUREMENT AND MODELLING ISSUES

For most macroeconomic or monetary policy objectives (unemployment, economic growth, external or budgetary equilibrium, price stability, etc.) there is a widely accepted measurable (set of) indicator(s) that define, and measure deviations from, the objective, even if these indicators are still subject to methodological and analytical debate and even controversy. In the case of macroeconomics and monetary economics, it took both disciplines some several decades of practice, trial and error, measurement and modelling development, and fundamental research to accomplish this. Financial stability analysis is still in its infancy and thus, by contrast, there is

as yet no widely accepted set of measurable indicators of financial stability that can be monitored and assessed over time. In part, this reflects the multifaceted nature of financial stability, as it relates to both the stability and resilience of financial institutions, and to the smooth functioning of financial markets and settlement systems over time.<sup>5</sup> Moreover, these diverse factors need to be weighed in terms of their potential ultimate influence on real economic activity. However, this situation also reflects the fact that the discipline of assessing financial stability is relatively new. Because measurement is not yet highly developed, the current practice of making financial stability assessments could be best described more as an art form rather than as a rigorous discipline or science.

Each of the three main conceptual aspects of the notion of financial stability outlined in Schinasi (2004) – resource allocation, risk pricing and management, and absorptive capacity – poses challenges for measurement. Take the simple example of measures of solvency for judging the potential resilience and absorptive capacity of an individual financial institution. Even if balance sheet capital (that is, the difference between assets and liabilities) provides a good indication of near-term shock absorption capacity, bank solvency may still not adequately capture the forward-looking dimensions of financial stability. If a bank's high levels of solvency reflect missed lending opportunities in a highly competitive industry, then the foundations may be laid for future weaknesses in the bank through future profit erosion and loss of market share. To take a financial market example, while measures of low asset price volatility could be indicative of stable conditions in a financial market, they may alternatively signal a failure in the price discovery process. Should this lead to a misallocation of financial resources, it may sow the seeds of vulnerabilities that could threaten financial stability in the future.

The challenge of measuring financial system stability extends well beyond the challenge of measuring the degree of stability in each individual sub-component of the financial system. Financial stability requires the constituent components of the system – financial institutions, markets and infrastructures – to be jointly stable. Weaknesses and vulnerabilities in one component may or may not compromise the stability of the system as a whole, depending on size and linkages – including the degree and effectiveness of risk-sharing between different components. Moreover, as different parts of the system perform different tasks, aggregating information across the system represents a challenge. For example, in diversified financial systems – where both financial institutions and markets are important providers of finance – there is no commonly accepted way of aggregating information on the degree of stability in both the banking system and financial markets in order to form an overall assessment of system stability. If the banking system is functioning well but, at the same time, there are signs of strains in financial markets, the overall assessment of financial system stability is likely to be ex ante ambiguous, particularly if the respective shares of the two components as providers of finance are similar. The more complex and sophisticated a financial system is, the more complex the task of measuring overall stability in a precise way is likely to be.

Measurement challenges in identifying the risks and boundaries to financial stability can be illustrated by examining aspects of the Minsky (1977) financial instability hypothesis.<sup>6</sup> In this hypothesis, as an economy

5 Sets of indicators have been developed – and are widely used – for assessing the soundness of banking institutions. See, for example, IMF (2003), *Analytical Tools of the Financial Sector Assessment Program*; IMF (2004), *Compilation Guide on Financial Soundness Indicators*; and L. Mörntinen, P. Poloni, P. Sandars and J. Vesala (2005), “Analysing Banking Sector Conditions – How to Use Macro-prudential Indicators”, *ECB Occasional Paper No 26*, April.

6 See H. M. Minsky (1977), “The Financial Stability Hypothesis: An Interpretation of Keynes and an Alternative to “Standard” Theory”, *Nebraska Journal of Economics and Business*, 16 (1), pp. 5-16.



enters into an upswing, risk premia are gradually eroded as managers of firms and banks discover that the majority of conservatively financed projects are succeeding. Gradually, two characteristics emerge: “Existing debts are easily validated and units that were heavily in debt prospered: it pays to lever”. As a result, prevailing risk premia begin to be considered as excessive. Lenders and borrowers begin to take on greater risks and, fuelled by credit and optimism about future profits, this sets off both growth in investment and exponential increases in asset prices. At some point, however, excesses occur, and the conditions that underpinned the boom eventually trigger its collapse. Overinvestment begins to reduce the return on capital, bankruptcy rates begin to rise, firms scale back on investment, and consumers reassess their capacity to repay debt. As optimism gives way to pessimism, aggregate demand in the economy falls sharply and asset prices plummet, possibly inducing a financial crisis.

In practice, the challenges of mapping such hypotheses into empirical frameworks for measurement can be significant. An implication of this hypothesis is that the inferences for risks to financial stability that can be drawn from some imbalance indicators may, at certain points in the cycle, be rather benign but, with a small change in the same direction, could suddenly pose a significant threat following the breaching of a key threshold. For instance, theory may not offer good answers to questions such as: at what pace of growth does robust and productive investment become overinvestment? Ultimately, the answers to questions such as these are likely to be settled not theoretically but empirically.

Analytical frameworks are required to help in guiding measurement, for example by identifying and suggesting the sets of variables and conditions that could underpin threats to financial stability. Presently, there is a dearth of general equilibrium models and

comprehensive system-wide approaches for identifying measures of, and risks to, financial stability.<sup>7</sup> Alternatively, some practitioners employ partial approaches, relying on the analysis of individual indicators of financial imbalances. Sometimes this entails basing assessments on “rule of thumb” thresholds derived from longer-term historical averages or from cross-country comparisons. Here, too, important measurement (and modelling) issues can arise. Many, if not most, imbalance indicators can be interpreted in one of two ways, with each one, which may be cycle-dependent, having different implications for financial stability assessments. As discussed, high levels of bank solvency, while possibly indicating a stable bank, could equally be the harbinger of emerging vulnerabilities. Narrow spreads across a wide range of fixed income markets could indicate perceptions of low credit risk in these markets, but also may reflect a mispricing of risks – as proved to be the case prior to, and following, the near-collapse of Long-Term Capital Management (LTCM) in 1998. High price-earnings ratios in equity markets might indicate a stock price bubble but could alternatively represent an accurate expectation of a future strengthening of corporate sector profitability. Similarly, while high non-financial sector debt ratios might be indicative of heightened credit risks facing banks, they could also be a reflection of a welfare-enhancing relaxation of liquidity constraints, together with a favourable assessment of long-term economic prospects by private economic agents. These examples serve to illustrate that in the absence of relying on a broad range of indicators and an understanding of the broader economic and financial environment in which indicators are being measured, excessive reliance on single indicator analyses can lead to unsound financial stability assessments.

7 A rare exception can be found in A. Haldane (2004), “Defining Monetary and Financial Stability”, Bank of England mimeo. Here a general equilibrium model is used to derive a simple financial stability “indicator” that is related to monetary stability.

In identifying risks and vulnerabilities, there are ways of dealing with the ambiguities that can arise in single indicator analyses. While identifying financial imbalances *ex ante* can be challenging, progress can be made by combining the information contained in individual indicators such as credit growth and asset prices (see Hargraves and Schinasi (1993), and more recently and rigorously, Borio and Lowe (2002)).<sup>8</sup> Other cross-checking approaches can involve looking beneath the surface of aggregate data by examining micro data. For instance, the question whether or not abnormally high aggregate household debt ratios pose acute credit risks for banks may easily be settled if micro data on households reveal that the most indebted households also have sufficient financial buffers to protect them against sharp changes in interest costs and/or employment income.<sup>9</sup> Overall, it would appear that the best assurance of a robust financial stability assessment is to base it on eclectic inputs – including a wide range of data sources.

An important component of any financial stability assessment is to assess the ability of the financial system to cope with problems, should plausible risks materialise. One of the most common ways to perform such assessments is stress testing, based on a range of techniques – including sensitivity and scenario analyses. These approaches, which are increasingly used by individual financial institutions<sup>10</sup>, are also being used at an aggregated macro level for assessing systemic stability. The IMF has formalised this through the introduction of macroeconomic stress testing as a key element in its Financial Sector Assessment Program (FSAP).<sup>11</sup> Sensitivity tests are ordinarily designed to isolate the likely impact of selected risk factors such as changes in interest or exchange rates. Scenario analyses tend to be richer, involving simultaneous moves in a number of risk factors. The scenarios can be based on historical episodes of financial stress or on hypothetical events that are considered to be plausible, or on sets of events. As such approaches often have a high degree of internal

consistency, they can make an important contribution to the understanding of the systemic relevance of financial risks.

While methodological advances have been made, as currently practised, macro stress-testing techniques have several limitations. The impacts of scenarios can be gauged both through bottom-up approaches – aggregating information on how a range of institutions would weather a plausible but “challenging” scenario – or at an aggregate level, perhaps employing a macroeconomic model. Combining the two approaches can facilitate cross-checking and more reliable assessment. However, a limitation of both approaches is that potential second-round effects of scenarios tend to be ignored because the underlying models pay insufficient attention to macro-financial interaction (as discussed in Hoggarth and Whitley (2003)).<sup>12</sup> This means that the overall impacts of adverse disturbances could well be underestimated. For instance, in the case of a decline in the pace of economic activity that is sufficiently large to challenge the robustness of the banking system, weakened banks might face an increase in funding costs and/or a withdrawal of deposits that puts further downward pressure on profits. At the same time, faced with deterioration in the creditworthiness of their customers, banks might be inclined to tighten lending terms and conditions. This would most likely have second-round effects on aggregate

8 See M. Hargraves and G. Schinasi (1993), “Boom and Bust” in *Asset Markets in the 1980s: Causes and Consequences*, in *Staff Studies for the World Economic Outlook*, IMF, December; and C. Borio and P. Lowe (2002), “Asset Prices, Financial and Monetary Stability: Exploring the Nexus”, *BIS Working Papers*, 114.

9 See, for instance, Sveriges Riksbank (2004), *Financial Stability Report*, 1; and the Special Feature in this Review entitled “Assessing the financial vulnerability of euro area households using micro-level data”.

10 See Committee on the Global Financial System (CGFS) (2005), “Stress Testing at Major Financial Institutions: Survey Results and Practice”, available at <http://www.bis.org/>.

11 See IMF (2003), “Analytical Tools of the Financial Sector Assessment Program”; and W. Blaschke, M. Jones, G. Majnoni and S. Peria (2001), “Stress Testing of Financial Systems: A Review of the Issues, Methodologies, and FSAP Experiences”, *IMF Working Paper*, WP/01/88.

12 See G. Hoggarth and J. Whitley (2003), “Assessing the Strength of UK banks through Macroeconomic Stress Tests”, *Bank of England Financial Stability Review*, 14.

demand and output, potentially leading to further losses in the banking system. Moreover, for a disturbance that was sufficiently large to cause the failure of a large financial institution, this might have a direct impact on the capital, or even solvency, of other (counterparty) banks. Macro stress testing, as currently practised, is generally not capable of assessing the importance or gauging the magnitude of these effects.

Financial stability assessments carry a higher degree of uncertainty than ordinarily associated with forecasts based on macroeconomic models. This is because there can be formidable practical challenges to measuring, modelling and assessing the consequences of rare events. A first practical challenge is that if past crises had been prevented or tackled by policy actions, assessments of the likely costs of a selected scenario, based on simulations drawn from historical datasets, would likely prove to be biased unless sufficient account is taken of policy reaction functions. It is doubtful that past policy responses to episodes of financial stress could be summarised by a mechanical reaction function, particularly if the authorities were mindful of avoiding the moral hazards that typically follow from predictable behaviour. Moreover, even in cases that did not prompt policy responses, the frequency of crises in historical datasets may be too low to facilitate precision in estimating the likely policy-neutral consequences of a stylised scenario.

Second, confidence intervals around the expected output losses associated with the materialisation of a specified scenario may be not well-defined statistically, or even not defined at all. For instance, simulations based on historical episodes tend to be founded on statistical relationships that reflect the central tendency of, rather than the tails of, probability distributions. Moreover, in purely hypothetical scenarios, it might not be possible to compute a confidence interval around the simulation because the events themselves may be subject to so-called Knightian uncertainty – or unquantifiable risk.<sup>13</sup>

Third, most macroeconomic models used for stress testing tend to be built on the basis of log-linear relationships. For simulations, this means that a doubling of the size of a shock will result in a proportionate change in the effect. However, in reality, it can never be excluded that in situations of financial stress, unpredictable non-linearities may surface, for instance due to threshold effects.

Fourth, as witnessed during the near collapse of LTCM in 1998, unexpected links may surface during crises, such as correlations between financial markets that do not ordinarily tend to be correlated. Given such uncertainties, the real economic costs associated with a particular scenario could well prove to be larger than those predicted by an empirical model. Such considerations would suggest that the output of any stress-testing exercise should only be viewed as indicative of how, or if, the financial system would endure such adverse disturbances. To avoid complacency, this calls for a high degree of caution and judgement in forming financial assessments.

Fifth, concerning measurement of the costs of financial instability, the literature is just in its infancy and has tended to focus on the increasing incidence of bank crises (see Bordo et al. (2001); Garcia-Herrero and Del Rio (2003)) and their considerable costs (see Lindgren, Garcia, and Saal (1996); Hoggarth and Sapporta (2001); and Barrell, Davis and Pomerantz (2005)).<sup>14</sup> Even defining a systemic financial crisis is not straightforward and, once defined, there are several elements to take into

<sup>13</sup> See F. H. Knight (1921), *Risk, Uncertainty, and Profit*, Cambridge, Riverside Press.

<sup>14</sup> See M. Bordo, B. Eichengreen, D. Klingebiel and M. Martinez-Peria (2001), "Is the Crisis Problem Growing More Severe?", *Economic Policy*, 32, pp. 51-82; A. Garcia-Herrero and P. del Rio (2003), "Financial Stability and the Design of Monetary Policy", *Documento de Trabajo*, 0315, Banco de España; C.-J. Lindgren, G. Garcia and M. Saal (1996), "Bank Soundness and Macroeconomic Policy", *IMF Occasional Papers*, 135; G. Hoggarth and V. Sapporta (2001), "Costs of Banking System Instability: Some Empirical Evidence", *Bank of England Financial Stability Review*, 10; R. Barrell, E. P. Davis and O. Pomerantz (2005), "Costs of Financial Instability, Household-sector Balance Sheets and Consumption", NIESR, mimeo.

account in assessing the costs (as Hoggarth and Sapporta demonstrate). In measuring the costs, it is particularly important to be mindful of feedback: banking crises can be caused by sluggishness in the pace of economic activity, but they can also be the cause of an economic slowdown or recession. A challenge for measurement is to disentangle the feedback effects and isolate the quantitative impact of the crisis on the economy. The costs associated with banking crises can include losses faced by stakeholders in the banks which have failed, including shareholders, depositors and other creditors. Taxpayers may face costs if there is a public sector resolution of the crisis. If, because of rising risk aversion or the rationing of credit, borrowers lose access to funds or face difficulties in accessing other sources of finance, economic activity may be adversely affected. The incomes of depositors may also be adversely affected if banks seek to widen spreads by lowering deposit interest rates in order to recoup loan losses. Finally, if the functioning of the payment system is impaired because consumers become reluctant to make deposits with banks, the overall adverse impact on economic activity may be magnified. For measurement, it is not clear-cut whether the overall costs should be gauged by losses in GDP, fiscal costs or some combination of the two. The impact on the broader macroeconomy of some crises may have been avoided because of early resolution, resulting in the incurrence of fiscal costs. For others there may have been no direct fiscal implication, but instead a significant impact on economic activity.

Although the wealth effects and costs of the bursting of asset price bubbles can be gauged, less progress has been made in determining the costs of financial market turbulence and dislocation. Possible channels would include the direct and indirect effects of loss of access to funds for borrowers in capital markets and/or the costs of refunding short-term obligations at higher cost with financial institutions, as well as the redistributive effects of asset price changes which could, in extreme situations,

have a direct impact on the capital, or even solvency, of banks.

#### **SOME REMAINING CHALLENGES IN DESIGN AND IMPLEMENTATION**

In order to advance the practice of financial stability assessment from an art towards a science, progress is necessary on at least three fronts: data, models and the understanding of linkages. Regarding data, several areas can be identified which contain shortcomings. A priority for data gathering must be micro balance sheet data covering financial institutions, households and firms. While a picture of the aggregate risks borne within each of these sectors can be useful for financial stability analysis, far more important is an understanding of the way in which the risks are distributed across sectors, and especially whether or not concentrations or pockets of vulnerabilities can be pinpointed. In mature economies, the availability and comprehensiveness of such data are rather mixed, particularly for the household sector.

It has become fashionable to employ indicators based on the prices of securities for financial stability assessment. In principle, if markets are efficient, then indicators derived from securities prices – such as credit spreads, distances-to default, volatilities implied by options prices, etc. – should contain invaluable information for financial stability. This is because securities prices should contain the collective expectations of the multitude of market participants with regard to the underlying fundamentals governing valuations. If those market participants also have an eye on the possible impacts of the same risks and vulnerabilities as the public authorities then, in principle, market indicators could reveal information on the ability of the financial system to weather plausible adverse disturbances. For instance, via risk-neutral densities, options prices can even facilitate the extraction of market-based probabilities of the occurrence of pre-specified asset price movements over pre-specified horizons.

However, there can be risks of circularity in this analysis: a comprehensive financial stability assessment should attempt to gauge whether there are plausible risks of market dislocations resulting from mispricing, whereas inferences on market expectations are built on the assumption that prices are always “correct”. More and better data on quantity indicators – such as indicators of liquidity, leverage, market positioning, etc. – would help in shedding light not only on the indicator properties of securities prices for financial stability assessment, but also on the vulnerabilities prevailing within financial markets.

Two areas where more and better analytical research on financial stability modelling appears necessary include models for identifying risks and vulnerabilities, and models for assessing the consequences of adverse disturbances.<sup>15</sup> Concerning the identification of risks, the literature suggests that it is doubtful that models will ever be capable of predicting crises, particularly when it comes to their precise timing. Nevertheless, this should not stand in the way of developing models for assessing vulnerabilities. Even simple single indicator approaches can be useful for gauging risks to financial stability (see Campbell and Shiller (2001))<sup>16</sup>, and ongoing work holds out some hope for the development of more comprehensive frameworks that could pinpoint the sets of variables (see IMF (2004)), as well as the conditions that increase the likelihood of financial stress (see, for example, Borio and Lowe (2002)). As for the prediction of crises, it cannot be excluded that, by borrowing from advances made in other disciplines in the modelling of discontinuous processes (such as the prediction of earthquakes), insights may be gained that can benefit financial stability assessment.

Ideally, to ensure an accurate assessment of the likely impact of adverse disturbances, it would be necessary to have dynamic general equilibrium modelling frameworks capable of

measuring (possibly non-linear) interaction within and between financial and non-financial sectors of the economy, including at the global level. Although current practices are far from achieving this, the implementation of macroeconomic stress-testing frameworks, such as those increasingly applied in the context of the IMF’s FSAPs, have undoubtedly advanced the development of internally consistent frameworks for assessing the resilience of financial systems to adverse disturbances.<sup>17</sup> Sources of risk and vulnerability can be quantitatively mapped into their impact on banks’ balance sheets, both individually and on a system-wide basis. However, reflecting the limitations of underlying models, current practices tend to ignore the second-round effects of financial crises. They also tend to focus exclusively on the functioning of the banking system, whereas a broader definition of the financial system requires an understanding of the likely impacts on other financial institutions and on the functioning of financial markets and infrastructures. This calls for further work to be conducted not only on the modelling of real-financial interaction, the complexity of which exhibits a tendency to increase over time, but also on interactions within the financial system itself.

Finally, a good understanding of linkages is crucial for financial stability analysis. To ensure that important linkages are not missed in a financial stability assessment, both the financial system and the sources of potential risk and vulnerability should be defined in

15 See R. Sahajwala and P. van den Berg (2000), “Supervisory Risk Assessment and Early Warning Systems”, *Basel Committee on Banking Supervision Working Paper*, 4, for an overview of early warning systems used by some G10 authorities, and M. Persson and M. Blåvarg (2003), “The Use of Market Indicators in Financial Stability Analysis”, *Economic Review*, Sveriges Riksbank, pp. 5-28, on the use of financial market indicators.

16 See J. Campbell and R. Shiller (2001), “Valuation Ratios and the Long run Stock Market Outlook: An Update”, *NBER Working Paper* No 8221, April.

17 See Blaschke et al. (2001), who review issues of measurement and methodology in stress testing, as well as the IMF’s experience with FSAP.

sufficiently broad terms. For instance, although alertness grew among market participants and public authorities in the late 1990s and in 2000 of the vulnerability of the US stock market to an abrupt correction, general awareness of the possible impact on the European insurance industry – one of the places where the subsequent market tumble hurt the most – was rather limited. This was mainly because little macro-prudential surveillance of the industry was being undertaken at the time. Micro balance sheet data, especially on exposures, can be helpful when seeking to identify the relevance of linkages both between real and financial sectors and within the financial system itself. As financial institutions strengthen their disclosure policies, data availability in this area has the potential to improve over time. In order to make inferences on the linkages and channels of contagion, cross-correlation analysis of securities prices can also be helpful, although sight should not be lost of the fact that during crisis periods, correlations may differ markedly to those prevailing when markets are operating smoothly.

#### CONCLUDING REMARKS

Current practice in financial stability assessment can probably be compared to the way monetary policy assessment was practised by central banks three or four decades ago – before there was a widely accepted, rigorous framework. The measurement challenges that lie ahead for financial stability assessment are formidable, in part because financial stability assessments must not only take stock of disturbances as they emerge, but also need to identify and examine the vulnerabilities that could lead to such disturbances occurring in the future. A forward-looking approach is required to identify the potential build-up of financial imbalances and to account for the transmission lags in policy instruments. The real difficulty is that financial crises are inherently difficult – if not impossible – to predict, in part because of contagion effects and likely non-linearities in both the build-up of imbalances and their

transmission to the real economy. In addition, financial stability risks often reflect the far-reaching consequences of unlikely events. This implies that the focus of attention is not the mean, median or mode of possible outcomes, but the entire distribution of outcomes, in particular the left tail.

While macro stress-testing techniques are improving knowledge with regard to determining the systemic relevance of plausible risks to financial stability, these techniques have important limitations – including, most importantly, shortcomings in the modelling of real-financial interactions and feedback as well as the uncertainty that surrounds estimates of potential costs. Until these limitations have been sufficiently addressed, the best and most pragmatic assurance of robust financial stability assessment is to use an eclectic approach that draws upon inputs from a wide range of data sources, indicators and models.

While many conceptual and methodological challenges lie ahead, it is important to acknowledge that significant progress has been made in recent years. Even though there is no obvious framework for summarising developments in financial stability in a single quantitative measure, a growing number of central banks around the world are making financial stability assessments and publishing financial stability reports, many of them based on a broad and forward-looking conception of financial stability.

## B FINANCIAL MARKET CONTAGION

*Recent research has greatly improved the understanding of financial contagion. There are two main channels through which contagion may emerge among financial markets: physical exposure and asymmetric information. Contagion can be empirically identified through the propagation of extreme negative returns, the increase in interdependence compared to normal times, and the distinction from common shocks. The evidence on international financial market contagion suggests that it is a relevant phenomenon that has indeed occurred in various crises, but in severe form, it is rather rare. In most instances the breadth of contagion seems to be limited to specific countries or geographical regions. In addition, it is less frequent across different asset classes than within the same asset class. Finally, simple measures for market co-movements, such as standard correlation coefficients, do not usually perform well as indicators of contagion.*

### INTRODUCTION

Recent research has greatly improved the understanding of financial contagion, stressing the propagation of extreme negative outcomes, the increase in interdependence compared to normal times, and the distinction of contagion from common shocks. This Special Feature examines the most widely used approaches in the research literature on how to assess financial market contagion phenomena. The second section describes market contagion from a theoretical perspective and illustrates its policy relevance. The third section reviews the main approaches on how to identify financial market contagion. The fourth section provides some selected evidence about the prevalence and breadth of market contagion phenomena, covering various areas of the world. Finally, the last section offers some tentative conclusions.

## CONCEPT AND POLICY RELEVANCE OF FINANCIAL MARKET CONTAGION

When a crisis in the stock market of one country causes a crisis in the stock market of another country this can be thought of as financial market contagion. There are two main channels through which contagion may emerge in financial systems: physical exposures and asymmetric information. As an example of the exposure channel, the following scenario can be considered. Assume that a crash in one financial market reduces the wealth of traders who are also active in other markets. They may then want to rebalance their portfolios and sell assets in other markets, triggering a crash there too, even if the two markets are unrelated in terms of their fundamentals (Kyle and Xiong (2001)).<sup>1</sup>

Asymmetric information across economic agents active in financial systems may also result in contagion. King and Wadhvani (1990)<sup>2</sup> argue that traders in international financial markets face “signal extraction problems”. Traders from one country may have only imperfect information about the situation in other countries. Hence, they have to extract further information from observable stock price movements, reflecting other traders’ behaviour. However, sometimes they will confuse price movements in relation to idiosyncratic problems in a foreign country with price movements that also reveal information about their home country. In this way, asymmetric information can cause excessive price spillovers across borders, including crashes. Moreover, Kodres and Pritsker (2002)<sup>3</sup> show that the transmission of idiosyncratic shocks across markets through portfolio rebalancing tends to be reinforced through asymmetric information.

1 A. S. Kyle and W. Xiong (2001), “Contagion as a Wealth Effect”, *Journal of Finance* 56 (4), pp. 1401-40.

2 M. King and S. Wadhvani (1990), “Transmission of Volatility between Stock Markets”, *Review of Financial Studies* 3 (1), pp. 5-35.

3 L. E. Kodres and M. Pritsker (2002), “A Rational Expectations Model of Financial Contagion”, *Journal of Finance* 57 (2), pp. 769-99.

Contagion is a policy-relevant issue for two reasons. First, some contagion phenomena have the character of externalities, resulting in an inefficient allocation of risk in the economy. Agents do not take the effect of their actions on other agents into account and, hence, the level of risk is too high. Ex ante policies, such as regulating markets, could be used to re-establish efficiency. Moreover, if they are not successful, then ex post intervention could, where necessary, be attempted in order to “neutralise” the trigger of contagion or to cushion the effects on other markets. Second, if contagion is very widespread, then such propagation could in theory contribute to a general destabilisation of the financial system and adversely affect growth. In such a worst-case scenario, macroeconomic stabilisation policies could help to fight the consequences of widespread contagion for the economy as a whole.

#### HOW CAN CASES OF MARKET CONTAGION BE IDENTIFIED?

The literature has now developed a number of empirical approaches on how to identify contagion in financial markets. As different methods lead to different results, most of the debate in the literature and among policymakers is about which approach captures the notion of contagion best.

Five main criteria have been proposed so far to identify contagion: (i) a decline in an asset price leads to declines in other asset prices; (ii) the relationships between asset price declines are different from those observed in “normal” times (regular interdependence); (iii) the relationships are in excess of what can be explained by economic fundamentals; (iv) they are negative extremes, such as market crashes, so that they correspond to crisis situations; and (v) the relationships are the result of propagations over time rather than being caused by the simultaneous effects of common shocks.

Most empirical approaches proposed in the literature on how to measure market contagion capture the first criterion, but this is where agreement usually ends. Authors differ in their view as to which of the other criteria are essential for identifying cases of contagion.

#### INCREASED CORRELATION DURING CRISIS PERIODS

One influential approach advocating the second criterion has been proposed by Forbes and Rigobon (2002).<sup>4</sup> The authors argue that contagion means that correlations between different equity markets increase significantly during well-known crisis episodes. One reason may be the information channel described above, which can enhance price spillovers in times of stress. If correlations do not increase, then any propagation of volatility during these crises is nothing more than the expression of the regular interdependence between markets, rather than a sign of contagion. The authors find no significant increases in equity market correlations during some important crises, such as the US stock market crash of 1987, the Mexican crisis of 1994 or the Asian crisis of 1997.

#### CO-MOVEMENTS IN EXCESS OF ECONOMIC FUNDAMENTALS

The idea behind the third criterion in the above list (“excess co-movements”) is that if financial market prices co-move by more than what would be justified by the fundamental variables driving those prices (say, due to asymmetric information), then this would be evidence of contagion. Examples are given in various studies, such as Shiller (1989)<sup>5</sup>, Pindyck and Rotemberg (1993)<sup>6</sup>, and Bekaert, Harvey and Ng (2005).<sup>7</sup> Shiller (1989) finds

4 K. Forbes and R. Rigobon (2002), “No Contagion, Only Interdependence: Measuring Stock Market Comovements”, *Journal of Finance* 57 (5), pp. 2223-62.

5 R. J. Shiller (1989), “Comovements in Stock Prices and Comovements in Dividends”, *Journal of Finance* 44 (3), pp. 719-29.

6 R. S. Pindyck and J. J. Rotemberg (1993), “The Comovements of Stock Prices”, *Quarterly Journal of Economics* 108 (4), pp. 1073-1104.

7 G. Bekaert, C. Harvey and A. Ng (2005), “Market Integration and Contagion”, *Journal of Business* 78 (1), pp. 39-69.



that between 1917 and 1987 US and UK stock market indices co-moved by more than what would be justified by the relationship between dividends paid in the US and the UK. Pindyck and Rotemberg (1993) divide 42 US companies into six groups, so that in each group the companies included produce different goods and exhibit low earnings correlation with each other. Then, for each group they run regressions of stock returns on current and lagged macroeconomic fundamentals for quarterly data ranging from 1969 to 1987, and test whether the residuals of these regressions are correlated across (within-group) firms. It turns out that in all cases residuals are highly correlated for all groups of companies. Bekaert, Harvey and Ng (2005) estimate a two-factor asset pricing model for stock returns of 22 countries, in which risk factors can vary across specific time periods. Contagion is defined as an increase in the correlation between the model residuals that cannot be explained by shifts in the common risk factors. In other words, this methodology combines the excess co-movements approach with the increase in correlation approach. The authors find evidence of such contagion effects among Asian countries during the Asian crisis, but not during the Mexican crisis.

#### CONDITIONAL SPILLOVER PROBABILITIES

In line with the fourth (and first) criterion, a further group of papers estimates the conditional probabilities of large returns in some markets as a function of large returns in other markets. Three main techniques can be distinguished in this regard: standard limited dependent variable estimations, quantile estimations of conditional spillovers, and applications of extreme value theory.

#### Limited dependent variable estimations

Eichengreen, Rose and Wyplosz (1996)<sup>8</sup> were perhaps the first to estimate the probability that financial crises could spread across countries, using a probit model. 20 industrialised countries were covered in their study over a time span between 1959 and 1993. The authors examine whether the occurrence of a balance of

payments crisis in one country increases the probability of a balance of payments crisis in other countries, conditional on political and macroeconomic country fundamentals. The results reject the null hypothesis of no contagion. Inspired by the epidemiology literature, Bae, Karolyi and Stulz (2003)<sup>9</sup> apply the multinomial logit model to explain concurrent large negative and positive returns among 17 emerging market countries, the US and Europe between 1992 and 2000 at a daily frequency. In other words, they estimate the probability that a certain number of markets decline by more than a certain return threshold as a function of a number of other markets declining by that much. By controlling for a few fundamentals (interest rates and exchange rates), they can also incorporate some aspects of the excess co-movements approach (criterion (iii)). They find some evidence of contagion between Latin America and Asia, but none between Asia and the US during the Asian crisis. Europe seems to be quite sheltered from shocks occurring in Asia, Latin America and the US. In this literature large market returns are usually defined as the 95 percentile, so that for weekly data, a large return occurs every 20 weeks.

#### Quantile regressions and co-movement box

Cappiello, Gérard and Manganelli (2005)<sup>10</sup> estimate conditional spillover probabilities between two financial markets using quantile regressions. The estimation of conditional probabilities in this approach follows a three-step procedure. First, adopting the conditional quantile regression technique of Engle and Manganelli (2004)<sup>11</sup>, individual time varying quantiles for returns on each financial market

8 B. Eichengreen, A. Rose and C. Wyplosz (1996), "Contagious Currency Crises: First Tests", *Scandinavian Journal of Economics* 98 (4), pp. 463-84.

9 K. Bae, A. Karolyi and R. Stulz (2003), "A New Approach to Measuring Financial Contagion", *Review of Financial Studies* 16 (3), pp. 717-63.

10 L. Cappiello, B. Gérard and S. Manganelli (2005), "Measuring Comovements by Regression Quantiles", *ECB Working Paper* No 501.

11 R. F. Engle and S. Manganelli (2004), "CAViaR: Conditional Autoregressive Value at Risk by Regression Quantile", *Journal of Business and Economic Statistics* 22 (4), pp. 367-81.

are evaluated.<sup>12</sup> Second, for each return and for each quantile, indicator variables that are equal to one if the observed return is lower than the conditional quantile (and zero otherwise) are constructed. Finally, an ordinary least squares regression on these indicator functions is carried out. The regression coefficients provide a direct estimate of the conditional probabilities of co-movements. This approach can be used to estimate spillover probabilities for any quantile of the empirical return distribution, i.e. any size of return, as long as it is not too close to the sample boundaries. A graphical representation of the spillover probabilities for different return sizes (“co-movement box”) allows an assessment on whether co-movements have increased significantly or not during times of specific crises. By implementing a statistical test of significant increases in spillovers, the authors also integrate the increases in correlation approach (ii) into their analysis. They apply their technique to daily data from EMEs in Latin America between 1988 and 2004. The evidence of contagion during crisis periods turns out to be mixed.

#### Applications of the extreme value theory

The extreme value theory (EVT) literature argues that in order to identify contagion, one has to look at much more extreme market movements than the 95 or 99 percentile in order to avoid mixing crisis linkages with non-crisis linkages. For example, the great stock market crashes of October 1929 or October 1987 are much less frequent, although these are the most interesting crises from a financial stability perspective. EVT allows conditional spillover probabilities to be estimated for these crises, the most dramatic market movements in history.

Longin and Solnik (2001)<sup>13</sup> were among the first to apply bivariate EVT to estimate extreme equity market spillovers. They assume that equity returns follow a logistic distribution, similar to Bae et al. (2003). This means that the extreme dependence between equity returns is described by the logistic tail copula.<sup>14</sup> Under

this assumption and for monthly equity market returns of G5 countries between 1958 and 1996, they find that the conditional correlation of extreme negative returns (crashes) is higher than for extreme positive returns (booms). Hartmann, Straetmans and de Vries (2004)<sup>15</sup> estimate extreme conditional spillover probabilities within and between stock and government bond markets of the G5 countries for weekly returns between 1987 and 1999. Looking at crisis linkages across asset classes is important when assessing how widespread contagion can be (“systemic risk”). Moreover, they estimate the spillover probabilities semi-parametrically, so that these probabilities (and the underlying tail copulae) are not fixed to follow a specific probability law. The results suggest that extreme linkages between stock markets are higher than extreme linkages between bond markets. Contagion across different asset classes is even weaker. Actually, there is evidence of “flight to quality”, which is described by stock market crashes being accompanied by booming government bond markets.<sup>16</sup>

#### SELECTED EVIDENCE ON INTERNATIONAL FINANCIAL MARKET CONTAGION

This section presents some selected evidence on the prevalence and breadth of contagion phenomena in international financial markets. It covers the three approaches using conditional spillover probabilities described above as applied to different regions in the world. It starts with the evidence provided by

12 Different quantiles of the return distribution refer to different sizes of returns.

13 F. Longin and B. Solnik (2001), “Extreme Correlation of International Equity Markets”, *Journal of Finance* 56 (2), pp. 649-76.

14 For a given bivariate or multivariate distribution, the copula is a function that describes the dependence between the respective two or more marginal distributions.

15 P. Hartmann, S. Straetmans and C. G. de Vries (2004), “Asset Market Linkages in Crisis Periods”, *Review of Economics and Statistics* 86 (1), pp. 313-26.

16 There are also a few papers referring to our last identification criterion, the propagation of contagion over time (criterion (v)). They have been surveyed in O. De Bandt and P. Hartmann (2000), “Systemic Risk: A Survey”, *ECB Working Paper* No. 35, sub-section 4.2.1.1.2, and are not further reviewed here.

EVT on the existence of extreme linkages between the stock and bond markets of G5 countries. It then shows to what extent European stock markets are exposed to spillovers from the US, Asia and Latin America, using the multinomial logit model. Last, it reports evidence on contagion phenomena among Latin American EMEs using the quantile regression approach.

#### CROSS-ASSET CONTAGION AND FLIGHT TO QUALITY AMONG G5 COUNTRIES

Table B.1 reports the results of the EVT cross-asset analysis conducted by Hartmann et al. (2004). The upper panel (panel a.) shows three measures of domestic spillovers between stock and government bond markets in France, Germany, the UK, the US and Japan. The “correlation” column shows the estimated correlation coefficient for the respective two return series. The “contagion” column shows the estimated crisis spillover probability, which is defined as the probability that for a given country both the stock and the government bond market will crash, assuming that one of the two has already crashed.<sup>17</sup> The last column shows the estimated probability that the government bond market will boom, given the stock market crashes (“flight to quality”).

A first observation is that regular correlation is not a reliable indicator of crisis spillovers. For example, the contagion risk between the Japanese stock and bond markets (9%) is almost twice as high as between the US stock and bond markets (5%). However, the US stock and bond markets are much more highly correlated (24%) than those of Japan (5%). Second, contagion risk across both asset classes is not very high (ranging between 3% and 12%). Third, the “flight to quality” phenomenon is roughly as frequent within the five countries as contagion. The latter two results illustrate some limits to the propagation of market crises within the major industrial countries.

**Table B.1 Domestic and international extreme stock-bond market linkages among G5 countries**

Country/ country pair	Correlation	Contagion	Flight to quality
<b>a) Domestic linkages</b>			
DE	19.0	2.7	3.4
FR	24.8	11.5	5.5
UK	21.7	5.9	7.3
US	23.5	5.2	4.6
JP	5.1	9.2	5.0
<b>b) Cross-border linkages</b>			
DE-FR	18.7	9.3	5.7
FR-DE	17.2	3.9	3.9
DE-UK	7.9	7.8	5.9
UK-DE	8.3	5.3	5.2
DE-US	1.5	3.5	7.9
US-DE	12.2	6.0	5.7
DE-JP	-5.6	9.6	6.8
JP-DE	0.0	1.4	3.1
FR-UK	16.5	5.2	8.0
UK-FR	10.2	6.8	5.1
FR-US	10.1	8.0	7.7
US-FR	9.7	2.8	3.0
FR-JP	-0.7	4.1	8.3
JP-FR	2.1	3.8	3.6
UK-US	-5.5	2.5	8.3
US-UK	14.1	3.8	5.2
UK-JP	-1.5	1.6	8.0
JP-UK	4.2	4.9	3.2
US-JP	6.8	6.9	8.0
JP-US	-1.1	5.0	3.3

Source: Hartmann, Straetmans and de Vries (2004), “Asset Market Linkages in Crisis Periods”, *Review of Economics and Statistics*, 86 (1), Table 3, p. 322. ©2004 by the President and Fellows of Harvard College and the Massachusetts Institute of Technology. Reproduced with kind permission by MIT Press.  
Note: All figures in the table are percentages.

The lower panel of Table B.1 (panel b.) refers to cross-asset spillovers across borders. It also distinguishes the “directions” of spillovers. The country pairs in the left-hand column state first the country with a stock market crash and second the country with a bond market crash (or boom). For example, the probability in line FR-US and column “contagion” describes the probability of a stock market crash in France

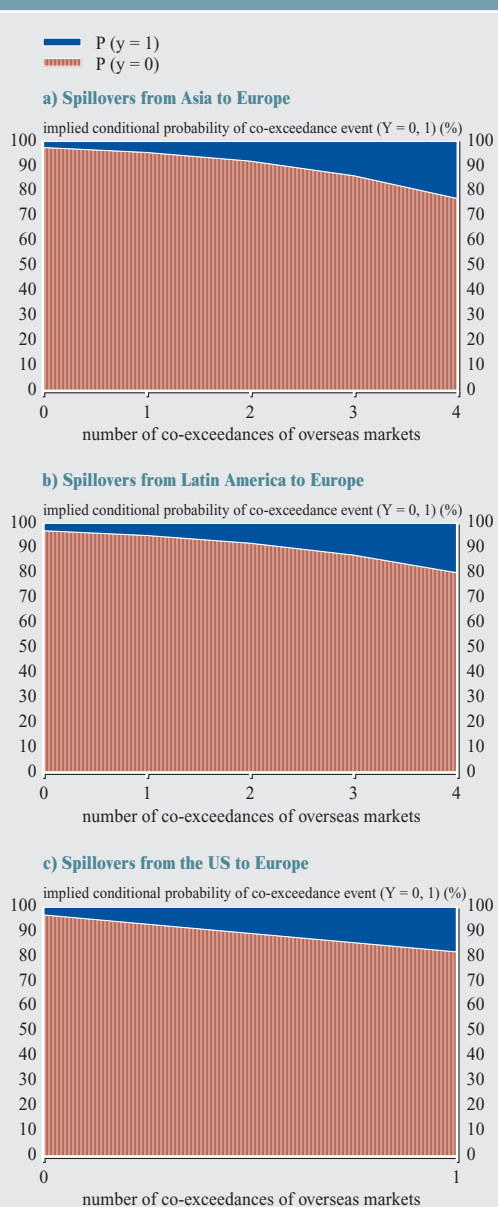
<sup>17</sup> A crash refers to a 20% weekly stock market decline and an 8% weekly bond market decline. This corresponds to the size of the 1987 stock market crash and a corresponding bond market crash, so as to make the historical frequency of both approximately equal.

given that there is a bond market crash in the United States (8%). The line underneath (US-FR) shows the reverse probability, which is substantially lower (3%). The results show that the extent of cross-border contagion risk across assets is quite similar to that of domestic risk, i.e. not particularly high. Moreover, there are not any specific geographic patterns. This may be interpreted as suggesting that with highly integrated international capital markets, distance does not shelter countries from crisis spillovers. Finally, there are some indications that the US government bond market has played the role of a safe haven. The flight to quality from other countries to the US bond market in the right-hand side column is estimated to be higher than from the US stock market to other bond markets, except for Japan.

### STOCK MARKET CONTAGION FROM OVERSEAS TO EUROPE

Charts B.1.a-B.1.c select those results from Bae et al. (2003) that provide information about the extent to which European stock markets are exposed to contagion risk from the US, Asia and Latin America.<sup>18</sup> For this application, they represent the probability that a large negative return could occur throughout Europe given large negative returns occurring in one, two, three or four Asian or Latin American countries (except for the US). The red areas show the probabilities of contagion to Europe, whereas the violet areas show the probabilities of the absence of contagion. As the number of large stock market downturns overseas increases, the red area becomes larger too, as the likelihood of adverse effects on European stock markets also rises. All in all, the relatively small area in red suggests that Europe is rather insulated against the occurrence of large equity market downturns in other regions. Nevertheless, the three charts also imply that Europe's exposure to Latin American shocks is still a little bit higher than its exposure to Asian or US shocks.

**Chart B.1 Conditional probability responses of European stock markets to large returns on overseas markets**



Source: Working paper version of K. H. Bae, G. A. Karolyi and R. M. Stulz (2003), "A New Approach to Measuring Financial Contagion", *Review of Financial Studies*, 16 (3), pp. 717-36.

<sup>18</sup> Asia is covered by ten countries (China, Korea, the Philippines, Taiwan, India, Indonesia, Malaysia, Pakistan, Sri Lanka and Thailand) and Latin America by seven countries (Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela). As for Europe, the authors use the Datastream International Europe index, which includes the following countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the UK.

## STOCK MARKET CONTAGION AMONG EMERGING MARKET COUNTRIES

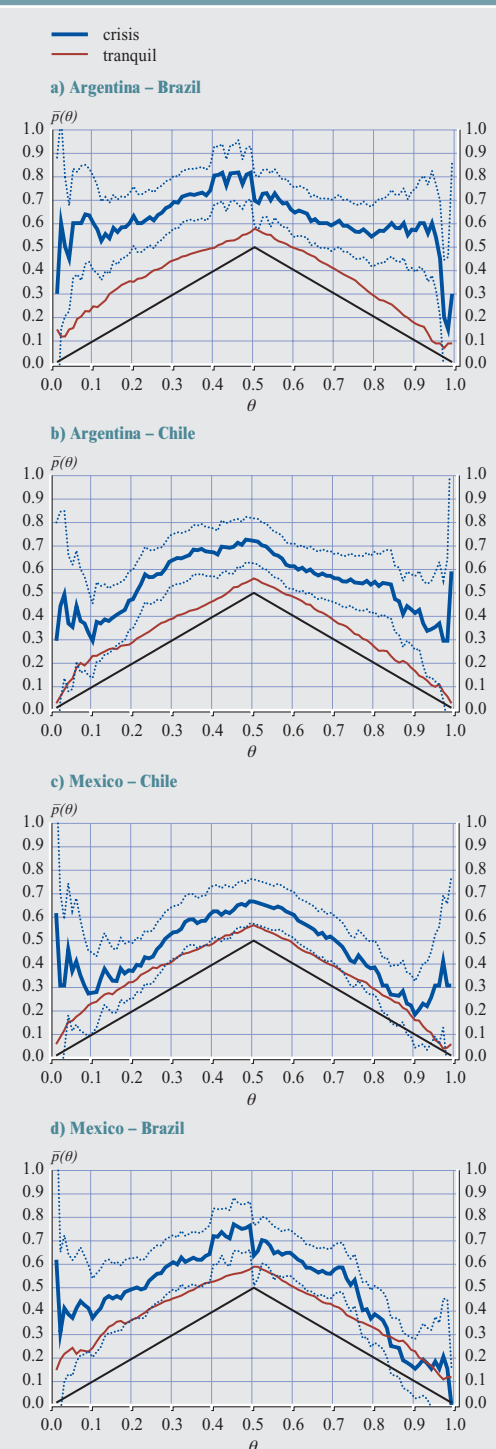
Cappiello et al. (2005) represent conditional spillover probabilities for returns estimated with quantile regressions in the so-called co-movement box. This is a square with unit side, where conditional probabilities are plotted against the thresholds. When the plot of the conditional probability lies above the 45° line, which represents the case of independence between two markets, then this is interpreted as evidence of positive co-movements. In general, the higher the conditional probability, the higher the co-dependence between two market returns. The authors use this methodology to investigate the joint impact of the “Tequila” crisis of 1994, the “Asian flu” of 1997 and the “Russian virus” of 1998 on the main Latin American equity markets (Argentina, Brazil, Chile and Mexico).

Charts B.2.a-B.2.d represent the estimated conditional probability of co-movement for a selected number of country pairs. Two solid lines are plotted together with the case of independence. The thin line indicates the conditional probability of co-movements over tranquil times. The thick line, by contrast, shows the conditional probability of co-movements during the three crisis periods. Confidence bands are plotted as dotted lines. For financial stability purposes, the emphasis is on the far left-hand side of the box, i.e. large negative returns. When the thin line there lies below the thick one and outside the confidence bands, this indicates statistically significant contagion. The results show strong evidence of contagion between Argentina and Brazil. Large negative spillovers also increase for the other three cases in the figures, but these changes are not statistically significant. Overall, it can be concluded that some EMEs are subject to stock market contagion, and others not.

## CONCLUDING REMARKS

This Special Feature illustrates that the literature has now developed a number of methods to identify and measure financial

Chart B.2 The co-movement box applied to Latin America – estimated conditional probabilities in crisis versus tranquil periods



Source: L. Cappiello, G. Gerard and S. Manganelli (2005), “Measuring Comovements by Regression Quantiles”, *ECB Working Paper*, No 501, Figure 4, pp. 25, 26.

market contagion phenomena. While all relevant features of contagion seem to be captured, there is still disagreement about which approach is the best to use. Therefore, it is probably better to employ several approaches rather than just a single one. Future research could also help to combine different approaches still further.

Keeping the above caveats in mind, the following tentative conclusions may be drawn from the evidence provided. As central banks are interested in the prevalence and breadth of contagion from a financial stability perspective, the emphasis should be on extreme market situations. While smaller correlation changes or excess co-movements may be inefficient, they will usually not be very important in terms of financial instability. Overall, international financial market contagion seems to be a relevant but relatively infrequent phenomenon. It does not occur with vehemence in each market crisis, but occasionally contagion phenomena are present. In most instances the breadth of contagion seems to be limited to specific countries or geographical regions. Moreover, the extent of contagion is easily overestimated if only stock markets are considered, which tend to be the most highly interlinked asset class. Many other asset classes, conversely, tend to be less interlinked. In addition, crisis propagation across different asset classes is much weaker than within the same asset class. The flight to quality is an economically relevant phenomenon that tends to limit the breadth of contagion. Finally, correlations are not a good indicator of contagion.

While very widespread severe financial market contagion is extremely rare, this does not mean that policymakers should disregard it altogether. Policies to maintain international financial stability are there to keep the likelihood of such extreme events – potentially related to general losses of confidence in the system – as low as possible. Policymakers must be prepared to face the consequences when such events do nevertheless occur and

risk affecting the functioning of the economy as a whole. A first step is that individual countries should “keep their own house in order” by establishing a stable macroeconomic environment and a resilient domestic financial system. In a second step – in the absence of a global central bank or supervisory authority – international financial surveillance and the setting of standards by the Financial Stability Forum and the IMF are important.

## C ASSESSING THE FINANCIAL VULNERABILITY OF MORTGAGE-INDEBTED EURO AREA HOUSEHOLDS USING MICRO-LEVEL DATA

*From a financial stability viewpoint, the condition of household sector balance sheets can have an important bearing on the credit risks that banks face. As in other mature economies, increasing household sector indebtedness in the euro area over recent years has raised some concerns about sustainability and, as a corollary, creditworthiness. Drawing upon survey information contained in the European Community Household Panel (ECHP) database, this Special Feature highlights some of the characteristics of indebted households in the euro area, and analyses the degree of vulnerability of mortgage-indebted households. The picture that emerges from an analysis of micro data covering euro area households over the period 1994-2001 suggests an overall improvement in resilience. In particular, mortgage debt appeared to be held mostly by high-income households, which tend to have good prospects for servicing debt. Nevertheless, considering the substantial increase in house prices and the significant accumulation of mortgage debt in some Member States after the period covered by the data examined in this Special Feature, continued monitoring of household sector indebtedness is called for.*

### INTRODUCTION

Against a background of improvements in the ability of larger groups of households to access credit, and as prospects for debt servicing improved in a low interest rate environment, the aggregate indebtedness of euro area households began to swell in the late 1990s.<sup>1</sup> Between 1997 and 2004 the stock of euro area household debt grew at an annual average rate of about 7%, and the debt-to-GDP ratio of the euro area household sector rose from 45% to 55%. With this, concerns about the sustainability of household sector debt and the possible risks posed to the stability of the euro area banking system began to surface.

Significant changes in financial aggregates, such as domestic credit growth, have often served as early-warning indicators of financial crises in mature economies.<sup>2</sup> In the euro area, while aggregate household sector debt rose at a faster pace than disposable income over the past decade, the increase in the debt-to-asset ratio was more muted.<sup>3</sup> Indeed, the ability of households to repay their debts out of liquid financial assets remained comfortable, despite some deterioration. At the same time, as interest rates fell and remained low, the total debt servicing burden – expressed as a ratio of disposable income – also remained broadly stable. Hence, assessments based on macro-level indicators of the risks and vulnerabilities posed by growing euro area household sector debt for financial stability have tended to be fairly sanguine (see sub-section 2.3).

Any analysis of developments in the aggregate indicators of household balance sheet conditions can mask important disparities in financial conditions across different segments of the household sector. For instance, not all households are indebted and, in order to draw accurate conclusions about the sustainability of household sector debt, which has to be repaid out of the income of those holding the debt, it is important to consider the debt ratio of the indebted population only. Moreover, a rise in the aggregate debt-to-income ratio could either be due to a rise in the actual debt ratio of indebted households, or it could merely reflect that the proportion of indebted households has increased. These two developments can have very different implications for financial stability, and can only be disentangled by examining micro data.

1 Household borrowing has increased considerably in a number of developed countries over the past two decades. See G. Debelle (2004), "Household Debt and the Macro-economy", *BIS Quarterly Review*, March.

2 See ECB (2005), "Indicators of financial distress in mature economies", *Financial Stability Review*, June, pp. 126-131.

3 This is a trend shared by many countries, both within and outside the euro area. For a comprehensive survey, see IMF (2005), "Household Balance Sheets", Chapter III, *Global Financial Stability Report*, April.

More generally, the sensitivity of aggregate household balance sheets to changes in disposable income, interest rates or house prices depends crucially on the relative importance and characteristics of different types of indebted households in the total population. Since these characteristics do not tend to be uniformly distributed across, for instance, the income spectrum of the household sector, an analysis based on macro indicators will not be capable of detecting growing pockets of fragility within the sector as they emerge. Hence, when seeking to form a comprehensive view of the risks and vulnerabilities posed by the household sector for financial stability, analysis of micro data can serve to complement macro-based assessments.

For this purpose, this Special Feature uses survey information from the European Community Household Panel (ECHP) database. The ECHP is a survey based on a standardised questionnaire that involves annual interviewing of a representative panel of households and individuals in the 12 euro area Member States.<sup>4</sup> By late 2005, the results from surveys spanning eight years, running from 1994 to 2001, had become available. A wide range of topics are covered by the questionnaire, such as income statements, health status and educational background, housing conditions, demographics and employment characteristics.<sup>5</sup> In addition, the survey includes an indication of households' own perception of their financial situation, for both owners and tenants. A set of variables describing households' financial situation can also be used to assess financial distress, which could be related to an excessive debt burden, and might provide a measure of default risk.<sup>6</sup>

#### AN OVERVIEW OF HOUSEHOLD INDEBTEDNESS

Data from the ECHP survey make it feasible to focus the assessment of the financial conditions on indebted households only. Notably, despite a significant increase in the

**Table C.1 Distribution of household debt in the euro area**

(% of total)	1995	1997	1999	2001
mortgage debt	19.1	20.1	20.6	21.2
non-housing debt	14.4	19.3	20.9	22.1
both debt categories	4.3	5.8	6.5	6.9
indebted	29.2	33.6	35.1	36.4
no debt	70.8	66.4	64.9	63.6

Sources: ECHP database and ECB calculations.

Note: Proportions calculated based on population weights.

amount of household debt outstanding between 1997 and 2001, the proportion of indebted households in the euro area increased only slightly from 33.6% to 36.4% of the household population over that period (see Table C.1). This contrasts with the situation in the US, where as much as 75.1% of households held at least one type of debt in 2001, up from 71.3% in 1998.<sup>7</sup> The distribution of debt by type – mortgage or non-housing-related debt – remained fairly stable in the euro area over the period covered by the survey. Approximately 21% of euro area households had a mortgage loan in 2001, and another 22% held some type of non-housing-related debt. The share of households carrying both types of debt was however rather small (6.9% in 2001).<sup>8</sup>

In order to analyse in more depth the indebtedness situation of households and their

4 The survey also includes Denmark, Sweden and the UK.

5 Despite the rich information content of the database, the short time-span of the coverage and the timeliness of the findings present obvious shortcomings. Furthermore, the ECHP survey does not contain stock variables on households' balance sheet items (outstanding debt, holding of assets, etc).

6 For a complete description of the ECHP database, see Eurostat (2003), "ECHP UDB: Description of Variables – Data Dictionary, Codebook and Differences between Countries and Waves", December. The ECHP has now been discontinued (the last wave was carried out in 2001), and will be replaced by the EU Statistics on Income and Living Conditions (EU-SILC). Unlike the ECHP, the EU-SILC will be harmonised ex post.

7 See A. Aizcorbe, A. Kernickell and K. Moore (2003), "Recent Changes in US Family Finances: Results from the 1998 and 2001 Survey of Consumer Finances", *Federal Reserve Bulletin*, January.

8 As a comparison, in 2001 49.3% of US families held home-secured debt (or other residential property debt), while 45.2% had instalment loans.



ability to service their debt, the households covered by the survey were divided into five equally sized categories according to their monthly net income.<sup>9</sup> As might be expected, the proportion of indebted households in the euro area has tended to be larger for higher income segments. In 2001, the proportion of indebted households ranged from 15% in the lowest income segment to 53% in the highest. There were also differences in the distribution of indebtedness across income levels for the different categories of debt. The share of mortgage-indebted households rose sharply with income, from 6% in the lowest income category to 37% in the highest category, suggesting that the bulk of mortgage debt was concentrated in the higher income segments. By contrast, non-housing debt tended to be more evenly distributed, at least in the higher income categories. Most of the households with the lowest incomes appeared to have no debt at all, and in those cases where they did, they tended to hold non-housing debt. Households with both types of loans belonged generally to the higher income segments.<sup>10</sup>

Considering patterns over time, the share of mortgage-indebted households increased somewhat between 1997 and 2001, especially for the mid-income categories, while it decreased slightly for the highest income category. The proportion of households holding non-housing debt, however, increased somewhat more over the same period (see Table C.1). In the four highest income categories, the proportion of households carrying non-housing debt increased by 3 to 4%.<sup>11</sup>

Within the euro area, the proportion of indebted households, as well as the stock of debt, varies to a wide degree across countries. At one extreme, only about 10% of the total number of households in Italy and Greece carried mortgage debt in 2001; at the other, almost every second household in the Netherlands had a mortgage loan (see Chart C.1). Analysis at the country level shows that between 1994 and 2001, no significant changes occurred in euro area

**Chart C.1 Proportion of indebted households across euro area countries**



Sources: ECHP database and ECB calculations.

countries in the debt composition across income categories, including those which experienced comparatively high growth in debt over the period.

### FINANCIAL CHARACTERISTICS OF MORTGAGE-INDEBTED HOUSEHOLDS

Lending for house purchase is of particular relevance to the banking sector, as it represents the bulk of bank lending to households in the euro area and it has expanded the most rapidly in recent years. Mortgage lending accounted for 69% of the outstanding amount of loans to households in the second quarter of 2005, up from 59% in 1998. The other loan categories – consumer credit and other lending – are mostly unsecured, which might imply an additional element of risk for the banks. However, these categories only represented 13% and 18%

<sup>9</sup> The grouping of households, and the calculation of the statistics presented, was conducted by applying population weights to the country samples. The aggregate results for the euro area were produced using country weights based on population size.

<sup>10</sup> These qualitative findings for the euro area broadly mirror those found in the 1998-2001 US Survey of Consumer Finances. The distribution of home-secured loans in the US is also skewed towards the higher income segments, while the percentage of families with instalment loans appears to be more evenly distributed.

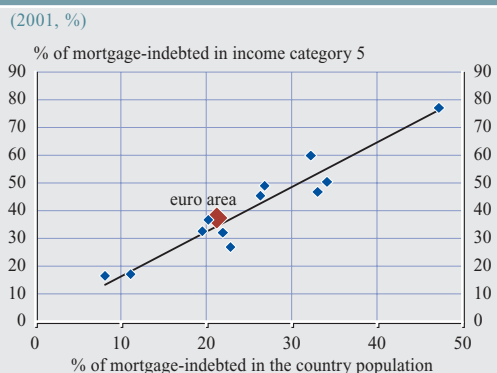
<sup>11</sup> The proportion of households with non-housing debt in the lowest income category – representing a group likely to be more sensitive to variations in unemployment and interest rates – only increased by 1% over the same period.

respectively of the total volume of credit outstanding in the second quarter of 2005, decreasing from 16% and 25% respectively in 1998. Moreover, the average amount of an individual loan for house purchase is substantially higher than in the other loan categories. Therefore, the rest of this Special Feature will focus on the financial situation of households carrying mortgage debt, the sustainability of which bears the strongest implications for financial stability.

In terms of financial resources, mortgage-indebted households tended to have a higher average level of income than the total population. These households also tended to report a better ability to save, regardless of their income level. On the other hand, mortgage borrowers had a lower average capital income than the household sector in total, and were less likely to possess a holiday home. The households in the highest income segment, however, represent an exception, reporting significantly higher capital income on average, and having an above-average income from rental activities.

Although the ECHP survey does not provide information on amounts, inferences can be made about where debt holdings are concentrated. First, considering both the proportion of mortgage-indebted households and the level of repayment burdens faced, the two highest income categories appeared to be the holders of the bulk of mortgage debt in the euro area. Second, the relationship between the share of mortgage-indebted households in the highest income category and the overall share of mortgage-indebtedness is indeed strongly proportional across individual euro area countries. Chart C.2 illustrates that the larger the proportion of mortgage-indebted households in a given country, the larger the share of mortgage-indebted households in the highest income category. For instance, in the case of the country having the highest proportion of mortgage-indebted (close to 50% of the total population) in 2001, the associated proportion of mortgage-indebted households in income category 5 was as high as 80%.

**Chart C.2 Concentration of mortgage-indebted households in the highest income category across euro area countries**



Sources: ECHP database and ECB calculations.

All else being equal, the higher the volatility of household income, the higher is the credit risk likely to be for banks who have extended loans to these households. In this respect, it was notable that the households in the highest income category also displayed the lowest income volatility throughout the sample. At the euro area level, the average volatility of income for the total population was 26%. The corresponding figure for the mortgage-indebted households was 22%, and as low as 16% for the mortgage-indebted households in the highest income category.<sup>12</sup> This pattern proved to hold true for all individual country samples, even if the level of volatility differed to some extent.

Because of the considerable dispersion in the levels of indebtedness across countries within the euro area, the level of mortgage payment burdens differs as well. In 2001, for instance, the average level of mortgage payments to income ranged between slightly more than 14% in Greece to 27% in the Netherlands.<sup>13</sup>

<sup>12</sup> The volatility estimates (representing the average one standard deviation in the annual percentage change in household income) were compiled using the panel dimension of the data, tracking individual households between 1996 and 2001.

<sup>13</sup> The level of mortgage debt outstanding and the mortgage servicing burden depend, to a large extent, on differences in the national mortgage markets and the domestic tax treatment of mortgage debt.

## THE SUSTAINABILITY OF MORTGAGE DEBT

From a financial stability viewpoint, what ultimately matters is the risk that banks face from mortgage lending. In this context, banks face the risk of being confronted with a higher rate of default on mortgage credit than they have set aside in provisions. The key determinant of the probability of such an event is the risk facing individual mortgage-indebted households of being unable to meet their debt servicing obligations.

There are many factors that can determine the financial risks affecting the debt servicing capacity of households. The sources of risk can be systematic or idiosyncratic. Among the systematic sources of risk, there are adverse disturbances at the regional, national or euro area-wide levels (such as changes in unemployment, interest rates or house prices). Idiosyncratic sources of risk (such as illness and divorce) might affect the financial situation of individual households. In the remainder of this Special Feature, the focus will be on shocks

triggered by macroeconomic events that are likely to impact banks' balance sheets the most. Financial risks also differ regarding their effect on financial resources (income flows, financial assets or home equity) or financial commitments (interest payments and family-related expenses).

Financial risk only matters to households if they, rather than for instance banks<sup>14</sup>, are ultimately exposed to its consequences. Vulnerability is an ex ante measure of this sensitivity, which could be defined as the degree to which households would be able to cope with the adverse effects of a shock, should it crystallise.

All else being equal, the total debt-at-risk of lenders' loan portfolios will have increased if banks have extended credit to vulnerable borrowers, or if an increasing proportion of indebted households become vulnerable. The data allow us to construct several indicators

<sup>14</sup> For instance, when mortgages are extended at fixed rates of interest, it will be the bank that extended the loan, rather than the borrower, which ultimately faces interest rate risk.

Table C.2 Household risk exposure and vulnerability indicators

trigger event of financial risk	financial variable impacted	vulnerability indicators (quantitative)	threshold of financial distress	vulnerability indicators (subjective) = perception of financial distress	vulnerability indicators (qualitative) = inability to make payment
rise in interest rates	monthly interest rate payment on outstanding mortgage	monthly debt servicing burden-to-income ratio	above 30%	housing costs are a burden	inability to pay mortgage payments
rise in unemployment rate	monthly income	monthly debt service burden-to-income ratio	above 30%	problems making ends meet	inability to pay mortgage payments
		financial margin	below zero		inability to face basic expenses
decrease in house prices (in combination with one of the two other risks)	housing equity (market value of the house)	mortgage debt to housing equity (or net housing equity)	below loan-to-value ratio		inability to pay bills

Source: ECB.

that measure the financial strength of households. A set of indicators representing measures of vulnerability, which corresponds to each of the different types of risk discussed, is presented in Table C.2. Each indicator is also associated with a certain threshold that may signal financial distress.

In terms of its ability to capture the different dimensions of risk faced by households, the total debt servicing burden-to-income ratio may have the highest information content for gauging debt-related vulnerability. This is because it can be impacted both by shocks to interest rate payments and to income.<sup>15</sup> Some evidence suggests that households facing debt servicing burdens in excess of 30% of their income might be classified as risky borrowers.<sup>16</sup> This can define a threshold for the total debt servicing burden-to-income ratio in indicating risks of financial distress related to this indicator.

The vulnerability of the household sector to financial strains can also increase in the absence (or because of weaknesses) of risk-reducing elements which could prevent or minimise the loss associated with the occurrence of a particular event. A useful indicator in this respect is the financial margin of mortgage-indebted households, which is defined as the difference between current total monthly income and the reported minimum monthly income necessary to make ends meet. A shock to income caused by deteriorating economic conditions (loss of or decrease in income owing to unemployment) could squeeze this margin to a level that would push households into financial distress, and eventually result in them being unable to meet repayment obligations. A negative financial margin is assumed to indicate financial distress.

For each indicator, the relevance of the above-mentioned associated quantitative threshold of financial distress is tested. For this purpose, two variables were used as proxies for financial distress: one indicating the perception of a high

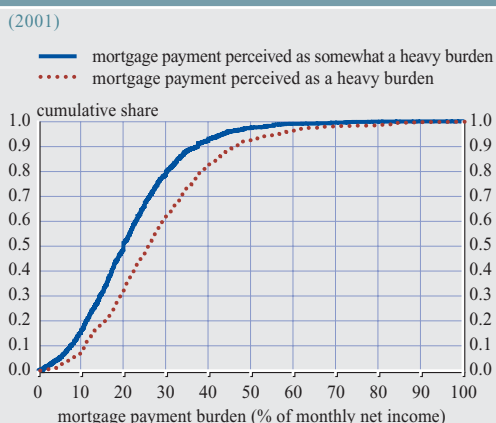
financial burden related to housing costs, and another reporting the household's inability to repay mortgage instalments over the last 12 months. One would expect the proportion of mortgage-indebted households reporting financial distress, as captured by the proxy variables, to increase significantly at, or around, the theoretical thresholds.

However, there appears to be no straightforward way to quantify the probability of being financially distressed on the basis of respondents' answers. The data do not support the existence of any uniquely defined threshold for financial vulnerability. In terms of the mortgage debt servicing burden, the share of households reporting that mortgage payments are a heavy burden does not significantly increase at the predefined theoretical threshold of 30% (see Chart C.3). As much as 60% of those who declared their mortgage payment to be

15 The impact of a change in interest rates depends among other factors on the interest rate variation regime of the mortgage contract, which varies widely across countries (see ECB (2004), *Financial Stability Review*, December, Box 6).

16 Some research based on individual US household balance sheets has associated the ratio of annual payments of principal and interest on all outstanding debt obligations (consumer and mortgage debt) to annual disposable income. A ratio of higher than 30% was found to be a statistically significant predictor of future household insolvency. See S. A. DeVaney and R. H. Lytton (1995), "Household Insolvency: A Review of Household Debt Repayment, Delinquency, and Bankruptcy", *Financial Services Review*, 4 (2), pp. 137-56.

Chart C.3 Perception of housing costs being a heavy burden



Sources: ECHP database and ECB calculations.

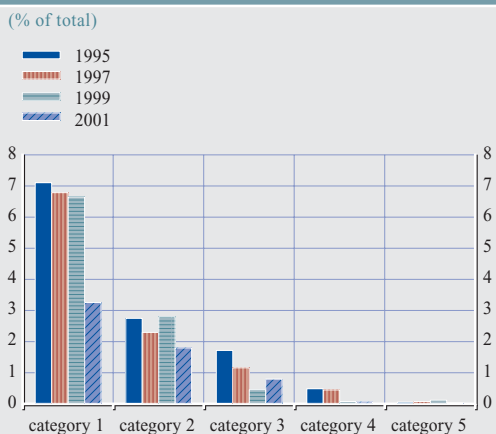
somewhat a heavy burden in 2001 had a mortgage debt servicing burden ratio less than the euro area average of 23%. The corresponding share for those perceiving mortgage payments as being a heavy burden was lower, but still rather high, at about 40%. Likewise, it does not seem possible to establish a clear relationship between a default on payments and the fact of having a negative financial margin.

A detailed picture of changes in the vulnerability indicators of mortgage-indebted households across income categories suggests that, notwithstanding the increase in household indebtedness, financial resilience improved somewhat in the euro area as a whole between 1994 and 2001. Both the payment ratio and the financial margin exhibited a stable pattern over the sample period in all five income categories, improving only slightly. On the other hand, the proportion of mortgage-indebted households reporting mortgage payment difficulties fell considerably in the lower and middle income categories. In the third income category, for example, this share fell from 4.8% to 3.3% between 1994 and 2001.

Of particular interest from a financial risk perspective is the category of mortgage-indebted households that are impaired by all three above-mentioned vulnerability characteristics, i.e. those with a mortgage payment burden in excess of 30%, together with a negative financial margin and a reported inability to pay their mortgage. Chart C.4 shows that the proportion of those most vulnerable mortgage borrowers tended to be lower in the higher income categories, and declined throughout the sample period. This proportion was the lowest in the two highest income categories, which accounted for almost 65% of all mortgage-indebted households in 2001 (compared to 6% for the lowest income category). Again, households in these two categories are likely to carry the bulk of outstanding mortgage debt.

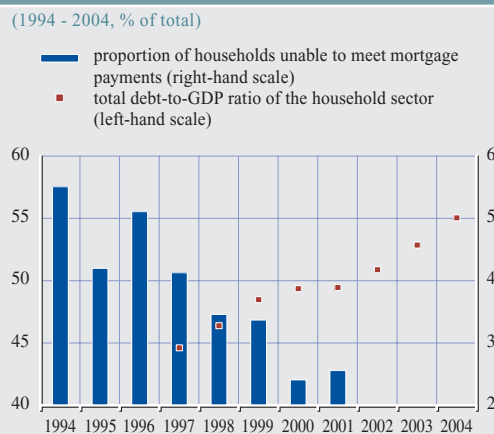
Several other variables in the dataset also support the view that financial resilience improved between 1994 and 2001. For instance, the ability to pay for utilities and other loans increased in all income categories. Likewise, households in all income segments reported much better prospects of making ends meet.

**Chart C.4 Proportion of vulnerable households among euro area mortgage borrowers across income categories**



Sources: ECHP database and ECB calculations.  
 Note: Vulnerable households are defined as having a mortgage payment burden in excess of 30%, a negative financial margin, and a reported inability to pay their mortgage. Germany and Luxembourg have been excluded owing to data limitations.

**Chart C.5 Vulnerability of mortgage-indebted households versus the total debt-to-GDP ratio in the euro area**



Sources: ECHP database and ECB calculations.  
 Note: The proportion of euro area mortgage-indebted households that reported difficulties in meeting mortgage payments has been calculated excluding Germany and Luxembourg, owing to data limitations.

Overall, the analysis suggests that borrowers' vulnerability decreased in all countries where mortgage debt grew rapidly between 1997 and 2001. It should however be emphasised that this analysis does not cover the period from 2001 onwards. This has to be borne in mind when considering the results, since this period has seen the most dramatic growth in mortgage debt (see Chart C.5).

The lack of survey data for the period after 2001 does not allow any conclusions to be drawn about how patterns of household vulnerability have changed since then. Nevertheless, it is possible to highlight a few facts that characterise latest developments.

First, the results from the ECHP data for the period 1994-2001 appear to be broadly in line with a number of country-level studies encompassing more recent data. These studies did not find any major recent deterioration in the financial situation of households, and confirmed – at least in the countries surveyed – that most of the debt still appears to be carried by the highest income households. Analysis of data from the British Household Panel Survey (BHPS) leads to the conclusion that the probability of mortgage payment problems among UK households, and the amount of debt at risk, decreased between 1994 and 2002.<sup>17</sup> In the case of the Netherlands, analysis based on micro-level data is available up to 2004.<sup>18</sup> More updated survey information is also available from Sweden, showing that the resilience of the Swedish household sector remained unchanged between 2001 and 2003.<sup>19</sup> Furthermore, analysis based on the Banca d'Italia survey of household income and wealth (up to 2002) concludes that the largest part of Italian household borrowing is accounted for by wealthier households.<sup>20</sup>

Second, the data show that the most significant changes in the vulnerability indicators discussed here appear to have followed developments in household income that were driven by macroeconomic developments. Following the slowdown in economic activity

between 2000 and 2002, euro area growth picked up in the second half of 2003. This development, together with the fact that interest rates continued to decline over the period since 2001,<sup>21</sup> suggests that the payment burden of euro area households has been contained since then.

Third, the most recent accumulation of euro area mortgage debt seems to have taken place in the countries where the financial resilience of the household sector improved between 1994 and 2001.

## CONCLUDING REMARKS

The level of household indebtedness in the euro area does not necessarily pose a material risk to financial stability in itself. Households outside the euro area have been able to carry much heavier debt burdens than those in the euro area.<sup>22</sup> The picture emerging from the analysis based on micro data suggests that the rise of household mortgage indebtedness between 1994 and 2001 did not create any major pockets of vulnerability within the euro area household sector over the period. The households most likely to carry most of the debt were those with the highest incomes. In addition, this category of households had sufficient financial margins to cope with an unexpected decrease in income, and held significant wealth buffers. As expected, this category also showed the best ability to cope with the adverse effects of a financial shock, as measured by the vulnerability indicators.

Based on macro indicators, e.g. the estimated debt service burden of the household sector

17 See O. May and M. Tudela (2005), "When Is Mortgage Indebtedness a Financial Burden to British Households? A Dynamic Probit Approach", *Bank of England Working Paper No 277*, October.

18 See De Nederlandsche Bank (2004), "Financial Behaviour of Dutch Households", *Quarterly Bulletin*, September.

19 See Sveriges Riksbank (2005), "Swedish Households' Debt-Servicing Ability 1997-2003", *Financial Stability Report*, 1, May.

20 See Banca d'Italia (2004), *Annual Report 2003*, May.

21 This applies to interest rates at both the short and the long end of the yield curve.

22 See ECB (2005), *Financial Stability Review*, June, Box 6.

(see Chart S37), there is little evidence to support concerns that euro area household sector resilience has deteriorated since 2001 given the decline in interest rates. A rise in interest rates could, however, alter the assessment. Unfortunately, it is not straightforward to extrapolate the results from the micro data beyond the sample period. The distinctive features of the national markets for housing finance in the euro area tend to make comparisons of vulnerability across countries somewhat difficult, especially as increases in house prices and the stock of mortgage debt have accelerated in many Member States since 2001. To the extent that households have been myopic concerning their expectations for future developments in interest rates and income growth, an unanticipated increase in repayment burdens could strain household balance sheet's, ultimately posing credit risks for banks. Against this background, continued monitoring of household sector indebtedness is called for.

## D WHAT DETERMINES EURO AREA BANK PROFITABILITY?

*Banks are key components of the euro area financial system. Understanding the interplay between banks and their operating environment assists in identifying sources of risk and vulnerability within the system. This Special Feature attempts to examine the empirical importance of bank-specific, market structure and macro-financial factors on euro area banks' financial performance over the last decade or so.*

### INTRODUCTION

Healthy and sustainable banking sector profitability is vital for maintaining the stability of the financial system. Even if solvency is robust, weak profitability can, by weakening the capacity of the system to absorb adverse disturbances, sow the seeds of future vulnerabilities. This Special Feature empirically examines factors that may drive profitability, measured by return on equity (ROE), among a panel of large banks in the euro area, based on individual banks' annual accounting data over the period 1993-2004. It builds on previous work in this area by trying to incorporate bank-specific, market structure and macroeconomic factors simultaneously in an empirical model and over a longer time period than previous studies.

The main findings are that bank profits tend to be persistent over time, though the inclusion of different explanatory variables weakens the statistical significance of this finding. Growth in total assets is positively related to profitability. Banks' equity capital appears to be positively related to profitability, although the evidence for this is somewhat mixed, depending on the control variables included. Finally, the macroeconomic environment, as captured by real GDP growth, positively influences bank profitability, a finding reported by banks themselves.<sup>1</sup> Overall, the results point to a need to improve understanding of the interplay between the

macroeconomic environment and the banking sector.

The reminder of this Special Feature is organised as follows: first a brief review of the relevant literature is provided; then, it provides an overview of the data and empirical methodology; and finally, it summarises the results and conclusions.

### FACTORS INFLUENCING BANK PROFITABILITY

Banks' earnings, or profitability, are one of the main indicators used to make assessments of the health of individual banks and, at the aggregate level, the banking system as a whole.<sup>2</sup> The question as to what determines bank profitability can, of course, be approached from several different angles. For simplicity, these factors are discussed under three main headings: bank-specific factors; market structure factors; and macro-financial factors identified in the previous work in the area.<sup>3</sup>

#### BANK-SPECIFIC FACTORS

Banks may differ in terms of their competitive strategy, efficiency, asset and liability diversification, and the way they manage capital and credit risk. The strategy and internal operations of an international bank whose balance sheet is measured in billions of

1 See Box 12 "Survey on major EU banks' perception of risks in the year ahead" in this Review.

2 A complementary approach, not employed in this Special Feature, utilises measures of profitability derived from equity markets, and relates these to bank-specific and business cycle variables. See L. Baele, R. Vander Vennet and O. De Jonghe (2004), "Bank Risks and the Business Cycle", University of Ghent, *Department of Economics Working Paper* No 264. Other approaches use banks' equity and debt prices as inputs in order to calculate forward-looking market indicators and measures of contagion risk from one bank to another; see for example R. Gropp, J. Vesala and G. Vulpes (2005), "Equity and Bond Market Signals as Leading Indicators of Bank Fragility", *Journal of Money, Credit and Banking*, forthcoming.

3 More expansive reviews can be found in A. Berger (1995), "The Relationship between Capital and Earnings in Banking", *Journal of Money, Credit and Banking*, 27 (2), May; J. Goddard, P. Molyneux and J. Wilson (2004), "Dynamics of Growth and Profitability in Banking", *Journal of Money, Credit and Banking*, 36 (6); and C. Northcott (2004), "Competition in Banking: A Review of the Literature", *Bank of Canada Working Paper* No 24.



euro is unlikely to be similar to a community-based savings bank with a balance sheet measured in millions. However, size does not necessarily say anything about the banks' relative profitability. Rather, profits are more likely driven by the *competitive strategy* chosen by the respective banks. Size, in balance sheet terms, may be a poor proxy for strategy, which more often tends to be determined by the bank's corporate ownership model.<sup>4</sup>

This may be an important consideration for the euro area, given that the euro area banking sector is composed of a fairly diverse group of institutions, both in terms of size and ownership structure. Indeed, banks in the euro area range from large bank holding companies and commercial banks to small savings, cooperative and mortgage banks. In addition, there is a large number of specialised government-owned banks. This complicates the analysis of profitability in the euro area banking sector when using bank-specific characteristics such as size and ownership as explanatory factors.

Just as productivity is an important determinant of macroeconomic performance, *efficiency* at the firm level is an obvious driver of bank profitability. When measuring efficiency in banking, one typically tries to gauge how a particular set of prices and quantities of inputs and outputs vary, in accordance with the banks' chosen strategy, and how this impacts on bank profitability.

Findings from the literature suggest that among certain bank categories, such as commercial banks, large banks tend to be more efficient than smaller ones. This result however may not hold for banks with other types of ownership structures, such as savings banks. Owing to the differing sample periods, variables and estimation techniques adopted in the various studies, it is difficult to draw any general conclusions concerning the efficiency of the European banking sector as a whole.<sup>5</sup>

A recent additional line of research is concerned with the effects of *diversification* on bank profitability. The intuition here is that more diverse sources of income may contribute to smoother/higher profitability. One of the ways that diversification has been measured in the empirical literature is to use off-balance sheet items as a proxy for non-interest income. Some evidence has been found that bank profitability is positively related to the extent of off-balance sheet business. Such conclusions need to be qualified, however, since the benefits of diversification may be outweighed by the exposure to non-interest income activities. These may be more volatile and less profitable than income generated through lending.<sup>6</sup>

Adequate *management of bank capital* can also be important in determining bank profitability because it potentially has a bearing on the availability of funding for future lending decisions. The empirical literature focusing on issues of a regulatory nature, such as capital adequacy, has found, based on US data, that capitalisation and profitability are positively related. It is also a key determinant of bank credit ratings, thereby directly affecting the costs of funding faced by banks. Higher capitalisation contributes to higher earnings, mainly through a reduction in interest rates

4 See R. DeYoung and T. Rice (2004), "How Do Banks Make Money? A Variety of Business Strategies", *Federal Reserve Bank of Chicago Economic Perspectives*, Q4. One notable exception in the European context is Y. Atlumbas and D. Marques Ibanez (2004), "Mergers and Acquisitions and Bank Performance in Europe: The Role of Strategic Similarities", *ECB Working Paper* No 398.

5 See P. Schure, R. Wagenvoort and D. O'Brien (2004), "The Efficiency and Conduct of European Banks: Developments after 1992", *Review of Financial Economics*, 13. For a comprehensive overview of the relationship between competition, efficiency and profitability, see J. Bikker and J. Bos (2004), "Trends in Competition and Profitability in the Banking Industry: A Basic Framework", *DNB Working Paper* No 18.

6 On the topic of off-balance sheet items and profitability, see J. Goddard, P. Molyneux and J. Wilson (2004), "The Profitability of European Banks: A Cross-sectional and Dynamic Panel Analysis", *Manchester School*, 77 (3). For the downside of diversification, see K. Sitroh and A. Rumble (2005), "The Dark Side of Diversification: The Case of US Financial Holding Companies", *Journal of Banking and Finance*, forthcoming.

charged on deposits not covered by deposit insurance, such as interbank deposits. The optimal management of bank capital manages to balance this constraint against that of foregoing profitable and riskier lending activities. Studies based on EU banks also find tentative evidence of a positive relationship between capitalisation and profitability, though the significance of this relationship varies across the countries in the sample.<sup>7</sup>

For banks, unexpected losses are deducted from capital and expected losses from credit risk are managed through the use of loan loss provisions. Most institutions set aside a predetermined amount to cover expected losses, and other amounts to cover losses related to specific loans. Increased provisions reduce profitability by increasing expenses on banks' profit and loss accounts. Some empirical evidence suggests that banks may under-provision during business cycle upturns, and delay provisioning until the downturn has set in.<sup>8</sup>

### THE ROLE OF MARKET STRUCTURE

The particular structure of the market in which banks operate may also influence bank profitability in two main ways. The first is that more market power, as proxied by concentration measures, tends to be associated in most industries with high levels of profitability, as firms collude to extract rents. The second explanation stresses the importance of potential competition, which depends on the barriers to entry to various banking markets. This could imply that market power as proxied by concentration may not matter as much as the threat of entry by new competitors.<sup>9</sup>

Work based on euro area micro data has found evidence for both of these hypotheses, albeit for particular banking products.<sup>10</sup> In the present context where different types of banks and countries are being considered, market structure measures may be important in explaining some of the cross-sectional variation in profitability across countries, as

well as the finding in the empirical literature that profits tend to be highly persistent.

### MACRO-FINANCIAL FACTORS

The *macroeconomic environment* may also impact on bank profitability through its effects on net income, on credit risk through the repayment abilities of borrowers, and on the value of collateral, all of which may vary with the economic cycle.

For example, deteriorating macroeconomic fundamentals, possibly combined with declining asset prices, could cause loan losses for banks. These losses may induce banks to reduce lending, which in turn further exacerbates asset price declines, possibly resulting in financial instability.<sup>11</sup> The incentives banks face over the business cycle may also change. Banks could also be tempted to assume greater risks if their franchise or charter value is threatened by loan losses initially caused by a macroeconomic downturn.

This suggests that macroeconomic variables may be important in this context. Indeed, empirical work on the causes of financial distress has focused on identifying common patterns in macroeconomic variables before the onset of banking crisis episodes. In some instances, this may take the form of a decline in the GDP growth rate below its trend value, particularly if the macroeconomic downturn

7 For the US, see Berger (1995), *op. cit.*, who also finds that this relationship breaks down for the period 1990-1992, possibly because banks overshot their optimal capital ratios. For Europe, see Goddard et al., (2004), *op. cit.*

8 See L. Laeven and G. Majnoni (2003), "Loan Loss Provisioning: Too Much, Too Late?" *Journal of Financial Intermediation*, Vol. 12.

9 In the euro area, individual bank behaviour and market structure may also have been affected by important regulatory changes, such as the introduction of the First Banking Directive in 1993 and additional directives since then such as the Large Exposures Directive (92/121/EEC), the Capital Adequacy Directive (C152/6/EEC), and the Investment Services (93/22/EEC) Directive, which came into force in 1994, 1996 and 1996 respectively.

10 See R. Gropp and S. Corvoisier (2002), "Bank Concentration and Retail Interest Rates", *Journal of Banking and Finance*, Vol. 26 (11).

11 See G. von Peter (2004), "Asset Prices and Banking Distress: A Macroeconomic Approach", *BIS Working Paper* No 167.

was preceded by strong credit growth combined with rapid growth in property prices.<sup>12</sup>

## DATA AND METHODOLOGY

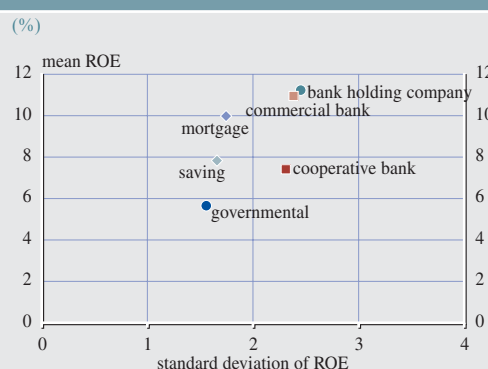
Euro area banks of differing ownership types operate and compete with each other in various market segments across the euro area. Therefore, this analysis relies on the classification provided in a private sector dataset which, in turn, is based on information provided by banks in their annual reports.<sup>13</sup> This section provides an overview of the various measures of financial performance of euro area banks, before moving on to describe the empirical methodology and results.

## MEASURES OF FINANCIAL PERFORMANCE

Variations in accounting measures of financial performance by ownership type may emerge between the various types of banks for several reasons. For example, commercial banks generate a higher return, given their focus on for-profit activities, but possibly at the cost of greater variability in returns. Mutually owned institutions or government-owned banks may have additional objectives to that of maximising profit, such as economic or social development goals for specific geographic regions.<sup>14</sup> One widely used measure of performance is ROE, which is defined in this study as the post-tax net income a bank has made during a given year, divided by the average shareholder equity during that year. The advantage of using this measure is that it captures income that the bank generates from traditional intermediation activities and from off-balance sheet activities, such as trading activity, and the provision of risk management solutions to clients.<sup>15</sup>

Chart D.1 plots the average ROE for various types of euro area financial institutions in the sample against its standard deviation. Bank holding companies and commercial banks show nearly identical ROE over the sample period, but with greater variability than other ownership types, indicating that higher return

**Chart D.1 Euro area banks' mean and standard deviation ROE**



Sources: Bureau van Dijk (Bankscope) and ECB calculations.  
Note: The sample period covers the period 1993-2004. The means and standard deviations are calculated for each group of banks across euro area Member States.

strategies are also associated with greater risk in returns. Moreover, the level and variability of profits experienced by these type of banks may be influenced by the experience of subsidiaries within the group. By contrast, cooperative banks and government-owned lending institutions show a much lower variability in return but a mean return only half of that recorded by bank holding companies and commercial banks.

12 See ECB (2005), "Indicators of financial distress in mature economies", *Financial Stability Review*, June, pp. 126-131; and C. Borio and P. Lowe (2002), "Asset Prices, Financial and Monetary Stability: Exploring the Nexus", *BIS Working Paper* No 114.

13 The individual bank accounting information used in this feature as well as the type of bank is drawn from Bankscope, a private sector database produced by Bureau van Dijk. Data for large euro area banks were selected and subsidiaries operating in the euro area were excluded, as were subsidiaries of foreign banks operating in the euro area. Observations lying in the 1st and 99th percentiles were discarded, as were institutions with implausible values such as a loans-to-total assets ratio of greater than 100%. Data are deflated using the GDP deflator for each country.

14 It is worth noting that for the US, there is relatively little agreement in the literature on whether ownership type matters for profitability. See J. Hughes, W. Lang, L. Mester, C. Moon and M. Pagano (2003), "Do Bankers Sacrifice Value to Build Empires? Managerial Incentives, Industry Consolidation, and Financial Performance", *Journal of Banking and Finance*, Volume 27 (3).

15 As a robustness check, profit before tax and country dummies were used to ensure that differences in corporate tax were not driving results. Both produced very similar results to those presented in this Special Feature. In addition, as the estimation is carried out in differences, it should not be affected to any large extent by different corporate taxes.

Three main reasons can be identified for these differences. First, some banks may benefit from a *diversification* effect if their sources of income are not concentrated on one particular market. Second, some institutions may be more *efficient* in terms of producing a given amount of output at minimum cost or maximising profit. Third, differences in the level and *management of capital* may lead to differing financial performances.<sup>16</sup>

The degree to which a bank is diversified may affect its ability to generate revenues through the business cycle. More diversified banks may be able to maintain consistent profitability over the business cycle because they are not reliant on any one particular market. However, as noted in some of the banking literature, diversity may also increase exposure to more volatile revenue sources without achieving any significant increase in profitability. Two measures of diversity are considered: one based on income, the other on assets.

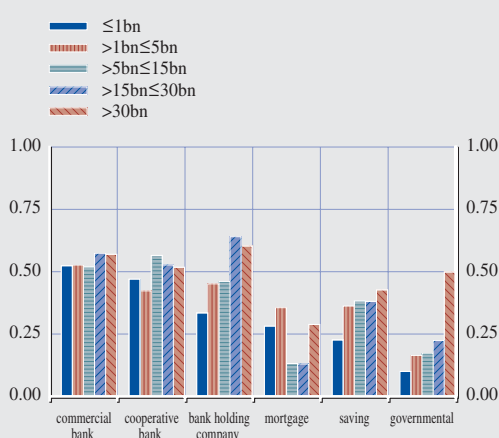
Income diversity attempts to gauge a bank's reliance on income from traditional intermediation versus more fee-based

activities. Chart D.2 shows one diversity measure by size and type for euro area banks.<sup>17</sup> According to this measure, commercial banks and bank holding companies are the most diversified, while government-owned and mortgage banks are the least diversified. It is notable that, on the basis of this measure, cooperative banks seem to be nearly as diversified as commercial banks, though this

16 It is possible that accounting ratios may also differ across countries due to differences in national taxation policy, possible earnings smoothing and variations in national accounting practices that are particularly related to the treatment of goodwill. (See Special Feature E on the effects of IFRS in this Review for further detail.) These differences are sometimes cited as a reason to use only market-based indicators. These indeed have some advantages. They are forward-looking, available at a higher frequency, and reflect relevant information on individual institutions. Market indicators based on equity prices, on the other hand, suffer from the drawback that equity investors may be willing to assume more risk and share in the benefits of a bank's management taking more risk than depositors. A more practical problem is that market indicators are typically only available for large listed banks. The availability of market indicators is a particular problem for euro area banks, as of the 300 or so banks used in this study, only 72 were in 2004 quoted institutions, limiting the coverage of the sample across countries and overtime. Gropp, Vesala, and Vulpes (2005), op. cit., use a sample of 84 EU15 banks.

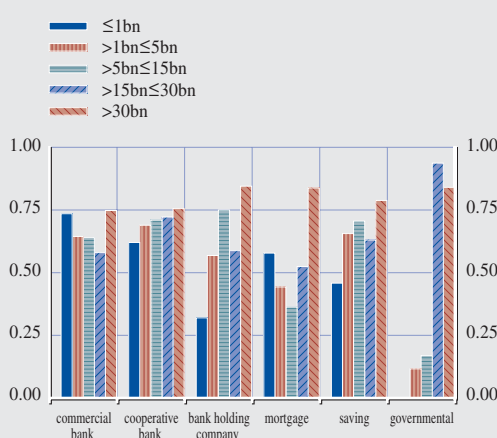
17 These diversity measures are based on R. Levine and L. Laeven (2005), "Is There a Diversification Discount in Financial Conglomerates?", University of Minnesota, mimeo.

Chart D.2 Euro area banks' mean income diversity by size group



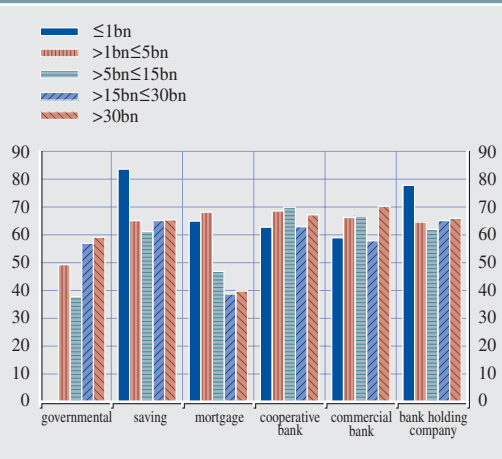
Sources: Bureau van Dijk (Bankscope) and ECB calculations.  
 Note: The sample period covers the period 1993-2004. Income diversity is calculated as 1-absolute value [(net interest income minus non-interest income)/(total operating income)]. A score of 0 indicates no diversity.

Chart D.3 Euro area banks' mean asset diversity by size group



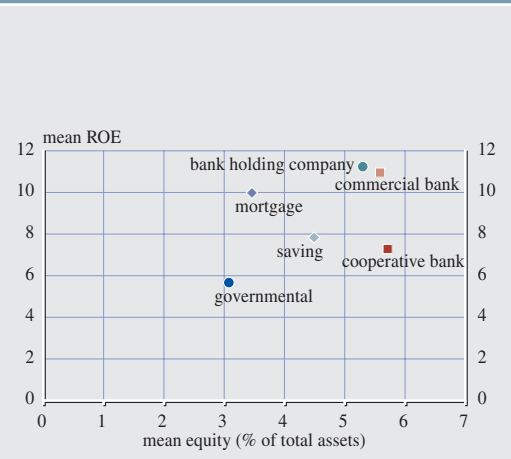
Sources: Bureau van Dijk (Bankscope) and ECB calculations.  
 Note: The sample period covers the period 1993-2004. Asset diversity is calculated as 1-absolute value [(loans minus other earning assets)/(total earning assets)]. A score of 0 indicates no diversity.

**Chart D.4 Euro area banks' mean cost income ratio by size group**



Sources: Bureau van Dijk (Bankscope) and ECB calculations. Note: The sample period covers the period 1993-2004.

**Chart D.5 Euro area banks' mean return on equity and capital ratios**



Sources: Bureau van Dijk (Bankscope) and ECB calculations. Note: The sample period covers 1993-2004.

conclusion depends both on the size and type of institution.

Asset diversity looks at the specialisation of the institution in terms of the intermediation activities it undertakes, and is based on balance sheet variables. For example, a high value of asset diversity indicates a better balance between loans and other assets. Chart D.3 suggests that asset diversity roughly increases with size. Commercial banks, bank holding companies and cooperative banks seem all quite diversified according to this measure.

The productive efficiency of banks may also influence profitability. One proxy commonly used to measure efficiency is the ratio of operating costs to income. As Chart D.4 shows, in some cases smaller institutions appear to be less efficient. However, no clear pattern can be identified in terms of mean levels of efficiency over the sample period.

Finally, capital management could affect profitability, and the literature suggests a positive relationship, given that retained profits, after subtracting operating costs and provisions, can be added to banks' reserves to boost capital if they are not paid out in dividends to

shareholders or used to cover unexpected losses. Chart D.5 plots the mean ROE and mean equity-to-total asset ratio for euro area banks. The chart suggests a slight positive relationship between capitalisation and profitability, although this appears to vary across bank type.

### ECONOMETRIC ANALYSIS

The estimation method adopted in this study is that of a dynamic panel data model. Panel data models combine a cross-section component (many banks observed at one point in time) with a time dimension (the same banks observed over different years). The cross-section nature of the panel controls for bank-specific factors and how these vary across banks. The addition of a time dimension allows other external factors – such as market structure and macroeconomic developments – potentially to impact on bank profitability.

A dynamic panel model builds on this by including a lag of the dependant variable as an additional right-hand-side variable. This has the advantage of allowing short-run dynamics to be explored. The main hypothesis to be tested is that that ROE is related to bank-specific characteristics such as lagged ROE

(+), size (+), capital (+), off-balance sheet items (+), provisions (-), and diversity measures (+ or -).

All these variables are treated as endogenous in the estimations, taking into account the potential relationship between the independent variables and the error term. Bank specialisation, market structure characteristics (concentration, Herfindahl index, (both +), and macroeconomic variables (real GDP growth, real property prices (both +)) are treated as exogenous in the estimations.

The estimation period covers the period 1993-2004, using an unbalanced panel of data based on 329 banks with a minimum of five years of consecutive data. Given the sign and significance of lagged profits, the results from the baseline model suggest first of all that the change in profits is persistent (see Table D.1).<sup>18</sup> This is a common finding based on the results of previous studies. On the basis of the sample considered, the change in profitability is also influenced by capital. This may be due to retained profits added back to capital; alternatively, well-capitalised banks may be able to pursue a wider range of business, including off-balance sheet business, owing to their higher creditworthiness.

Loan loss provisions have the expected (negative) sign, but the coefficient is

insignificant. The positive and significant role for real GDP growth tends to confirm the view that macroeconomic developments are important for bank profitability. For example, the cyclical effect of real GDP growth could be overwhelming the provisioning cycle. Finally, the change in the size variable also has a positive effect, suggesting that profitability is positively related to an increase in the inflation-adjusted size of a bank's balance sheet.<sup>19</sup>

Given that the estimation method takes into account bank-specific differences, it is not surprising that the variables measuring banks' specialisation are insignificant. Finally, concentration measures – such as the ratio of

18 After taking lags and differencing, this left approximately 1,400 bank-year observations available for estimation, depending on the independent variables used. The one step standard errors are used for inference. The estimations were carried out using the Arellano and Bond GMM estimator. The one step standard errors are used for inference. The diagnostic tests referred to in Table 1 are the Sargan test for the validity of over-identifying restrictions, and tests for first and second order autocorrelation. For more details, see M. Arellano and S. Bond (1991), "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations", *Review of Economic Studies*, 58.

19 As an additional robustness check on the estimations, the system GMM estimator of Blundell and Bond (1998) was used; the results were similar to those presented here. For more details, see R. Blundell and S. Bond (1998), "Initial Conditions and Moment Restrictions in Dynamic Panel Models", *Journal of Econometrics*, 87; and R. Blundell and S. Bond (1999), "GMM Estimation with Persistent Panel Data: An Application to Production Functions", *IFS Working paper 99/4*.

Table D.1 Empirical results

variable	sign	significance	sign	significance	sign	significance
lagged profit	+	yes	+	yes	+	no
capital	+	yes	+	yes	+	yes
off-balance sheet	+	no	+	no	+	no
size	+	yes	+	yes	+	yes
real GDP growth	+	yes	+	yes	+	yes
loan loss provisions	-	no	-	no		
specialisation dummies			+	no		
concentration					+	no
diagnostic tests	yes		yes		yes	

Source: ECB calculations.

Note: The diagnostic tests' "yes" refers to non-rejection of both the Sargan test for the validity of over-identifying restrictions and tests for second order autocorrelation. Significance denotes results that are significant at a 10% level or lower.

the five largest banks' assets to the assets of each country's banking system and the Herfindahl index – were positively signed but insignificant. Given that market structure changes only slowly over time, the lack of variation in these variables within countries and over time is probably the reason for its statistical insignificance. In this case, a reduced sample owing to the unavailability of market structure indicators before 1997 may also be a contributing factor. While these measures are standard indicators of market structure, it cannot be ruled out that alternative measures may reveal a different relationship. Investigation of this topic is beyond the scope of this Special Feature. The inclusion of the variable leads to the lagged profit variable becoming marginally insignificant, thus pointing towards some relationship between market structure and profitability.

Alternative specifications were tried as robustness checks. Two main types of checks were carried out: ones based on bank-specific factors, and ones based on macroeconomic factors.

The inclusion of asset and income diversity measures weakens the significance of the lagged profit variable, perhaps indicating that the previous findings of profit persistence may be due in part to an omitted variables

problem.<sup>20</sup> Although the data were screened carefully before estimation, idiosyncratic events relating to certain banks could have driven the results. To check this, dummy variables based on data from Gropp et al. (2004) were therefore used to control for this. The results were unchanged. To control for the possibility that mergers or takeovers could be responsible for the role that growth in size appears to play, dummy variables were constructed for banks that were involved in M&As. Their inclusion did not however affect the results, probably because only a small number of observations in the sample were affected.

One country in the sample experienced a banking crisis at the beginning of the sample, and an interaction dummy for the country and real GDP growth was used in the estimation. While the dummy was significant, the overall effect on the results was similar to those reported in Column 3 of Table D.2 below. Finally, an experiment was carried out to replace real GDP growth with real residential property prices; however, the variable proved to be insignificant.

<sup>20</sup> Additional instrument lags for the independent variables were also used in this instance. The lagged profit variable continued to remain insignificant.

**Table D.2 Empirical results**

variable	sign	significance	sign	significance	sign	significance
lagged profit	+	no	+	no	+	yes
capital	+	no	+	yes	+	yes
off-balance sheet	.	.	.	.	.	.
size	+	yes	+	yes	.	yes
real GDP growth	+	yes	+	yes	.	.
income diversity	-	no	-	-	.	.
asset diversity			-	no		
real property prices					-	no
diagnostic tests		yes		yes		yes

Source: ECB calculations.

Note: The diagnostic tests' "yes" refers to non-rejection of both the Sargan test for the validity of over-identifying restrictions, and tests for second order autocorrelation. Significance denotes results that are significant at a 10% level or lower.

## CONCLUDING REMARKS

This Special Feature set out to review various factors identified in the literature that may affect bank profitability. Based on micro data, stylised facts concerning euro area bank profitability were presented. Finally, an econometric analysis based on a dynamic panel data approach was carried out to identify factors that could influence bank profitability in the euro area.

Both macroeconomic and bank-specific factors appear to have a role to play, with real GDP growth and bank size being the most important determinants. A positive but weaker relationship was found between bank equity capital and profits. It is important to note that the estimation method takes into account the potentially endogenous nature of the relationship between lagged profits and capital. On the other hand, the regression model is a reduced form model and not derived from a structural economic model. This means that it is difficult to identify the exact nature of the links between size, capital and profitability based on the current approach.

Overall, for the purposes of financial stability monitoring, the results point towards a need to analyse and understand better the interplay between bank-specific factors and the macroeconomic environment before any firm policy conclusions can be drawn. Additional work in two particular areas could prove valuable in this regard. First, the relationship between size and profitability could be analysed further in order to determine whether this operates via economies of scale and scope. Second, further analysis of the empirical effects of income and asset diversification on bank profitability could improve understanding of the overall effect of growth in non-interest income on bank profitability and stability.



## E MAIN EFFECTS FROM THE NEW ACCOUNTING FRAMEWORK ON BANKS

*The EU Regulation requiring all listed companies, including banks, to prepare consolidated financial statements in accordance with International Financial Reporting Standards (IFRS) has been a positive development that will increase the transparency and comparability of financial statements in the EU. However, the first-time application of these new rules will have a significant impact on financial statements which should be taken into account when analysing the accounting figures. The aim of this Special Feature is to provide a brief overview of the main ways in which IFRS will affect banks' primary financial statements.*

### INTRODUCTION

Regulation 1606/2002/EC<sup>1</sup> concerning the application of IFRS<sup>2</sup> was adopted by the European Parliament and the EU Council on 19 July 2002. According to this Regulation, for each financial year starting on or after 1 January 2005, all companies listed in the EU, including banks, are required to comply with the accounting and financial reporting standards issued by the International Accounting Standards Board (IASB) with regard to their consolidated accounts. In order to become effective in the EU, each individual IASB standard is required to be endorsed by the EU Commission. At this juncture, however, it should be noted that the standard concerning the recognition and measurement of financial instruments (IAS 39), which is extremely important to the banking industry, has only been partially endorsed and, in that context, certain hedging provisions have been carved out. It should in addition be noted that the Regulation also contains the option for Member States to extend the application of IFRS to financial statements of individual firms and to unlisted companies.

The purpose of this Special Feature is to highlight the likely main effects from the

introduction of the new accounting rules for banks. Changes in the new EU accounting framework may potentially affect the indicators used in the Financial Stability Review in two main ways. First, one-off effects could arise in the financial statements owing to the transition from national accounting principles to the new framework. Such one-off effects would affect the components of the macro-prudential indicators. This sort of change in the indicators is independent of underlying changes in the stability of the financial system. Second, following the introduction of the new framework, balance sheet items are likely to display different time series behaviour compared to that under the current national rules. Such differences could for instance materialise in higher or lower volatility or in altered sensitivity of accounting figures to market factors such as changes in interest rates or prices for shares. Consequently, changes in the prudential indicators need to be interpreted with care during the transition phase.

The aggregate impact of the changes introduced by IFRS on the banking sector as a whole is, however, impossible to assess ex ante. Indeed, the overall impact very much depends on the composition and structure of each bank's balance sheet. The accounting rules currently in place also play an important role, as some national standards are quite similar to IFRS, while others significantly differ. Finally, the overall impact also depends on the accounting practices of individual firms and their use of different options incorporated into the accounting rules.

Notwithstanding the above-mentioned difficulties in assessing the impact of the introduction of the new accounting framework, this Special Feature tries to identify the main changes in the accounting rules which are

<sup>1</sup> Generally known as the "IAS Regulation".

<sup>2</sup> International accounting standards issued by the London-based International Accounting Standards Board (IASB).

relevant for banks and may have a significant impact on their balance sheets and income statements.

It is important to note that the effects of the new accounting framework will not materialise to an equal extent in all the various financial indicators or reporting. Indeed, prudential reporting based on individual accounts would not necessarily<sup>3</sup> be affected by the new rules, contrary to consolidated prudential ratios based on consolidated accounting figures. Furthermore, some effects in the calculation of regulatory capital will be mitigated through internationally agreed “prudential filters” (see section below concerning the impact on regulatory capital). Hence, indicators concerning regulatory capital (e.g. solvency ratios) which are associated with prudential filters may be affected by the new accounting framework in a different way than indicators that rely on the accounting definition of equity capital (e.g. ROE).

This Special Feature focuses upon the following areas: (i) reclassification of instruments as debt or equity; (ii) accounting for business combinations; (iii) valuation of financial instruments, which also includes the recognition of derivatives, available-for-sale securities, hedging provisions, the fair value option, share-based payments and allowances for credit losses and own credit risk; (iv) measurement of post-employment benefits; (v) de-recognition of special purpose entities; (vi) dividend adjustment; and (vii) software and other intangibles.

Finally, the article ends with a brief discussion on the prudential filters used by banking supervisors with the aim of safeguarding the definition and quality of regulatory capital.

### RECLASSIFICATION OF DEBT AND EQUITY INSTRUMENTS

The definition of debt and equity classification principles applicable to capital instruments differ under IFRS compared to most national

accounting rules. According to IFRS, issued instruments are classified as liabilities when the issuer has a present obligation to deliver cash or another financial asset to the holder of the instrument.

Hence, the introduction of IFRS has entailed the reclassification of certain debt and equity instruments. For example, certain capital instruments such as preference shares that were previously treated and recognised as equity will now need to be reclassified as liabilities. IFRS distinguish equity from non-equity preference shares on the basis of whether the dividends paid out on the share are mandatory or discretionary. In the former case, preference shares are required to be reclassified as liabilities, which will result in a negative adjustment in equity. It should be noted that non-equity minority interest, which is recognised under equity on the balance sheet, may also need to be reclassified into liabilities. This may have a potentially negative impact on net income, as the reclassification results will affect the interest expense.

Conversely, certain instruments (e.g. reserve capital instruments) previously recognised as liabilities will be reclassified as minority interest, which is presented within shareholders’ equity on the balance sheet. This reclassification will result in a decrease in interest expense.

The overall impact of the reclassification of debt and equity instruments on equity and on net income greatly depends on the specific composition of individual banks’ balance sheets.

It should be noted that for prudential purposes, the current definition of own funds will be maintained, and hence the potentially different accounting classifications of debt and equity instruments will not affect regulatory capital.

<sup>3</sup> In cases where firms are required or provided with an option to use IFRS for their individual accounts, prudential reporting based on individual accounts could be similarly affected by IFRS.

## BUSINESS COMBINATIONS

When combining businesses through the acquisition of another business, the acquirer typically pays a price that differs from the net book value of the assets and liabilities of this business. This difference, which is typically a positive amount, is referred to as goodwill. Prior to the introduction of IFRS, most national standards required such goodwill to be amortised according to a predetermined schedule or for it to be fully written off immediately after the acquisition. Hence, the treatment of goodwill differs across entities within a jurisdiction.

Two main observations may be made from comparison of the new framework with current national rules. First, the measurement of goodwill deserves attention. Under IFRS 3, the currently applicable standard for business combinations under the new framework, goodwill is measured by allocating the cost of the acquisition to the fair values of identifiable assets and liabilities of the acquired business. The excess of costs then constitutes the goodwill. This can differ from current national rules, where merger accounting<sup>4</sup> may imply zero goodwill, where more flexibility may be available in allocating the cost of the acquisition to balance sheet assets, and where goodwill might not reflect fair values.

Second, under IFRS, goodwill is recognised as an asset that must not be regularly amortised. Rather, it needs to be tested for impairment, i.e. it is regularly tested to establish whether the present value of the business units still justifies the reported goodwill. If not, an impairment loss is recognised that cannot be recovered later. By contrast, negative goodwill at the time of the acquisition is immediately recognised in profit and loss.

The ongoing effect of IFRS 3 is that income-based financial indicators are not necessarily weakened following an acquisition or a merger. Furthermore, the ongoing amortisation of past acquisitions will cease, improving earnings in

principle. In the long run, it is however unclear whether the impairment tests will effectively lead to a quicker writing off of the goodwill than regular amortisations, although in a less smooth fashion. If the economics of a merger have been overestimated and the acquisition was overpriced, this may become apparent before the end of the regular amortisation schedule, thus triggering a full write-off of the goodwill. It is moreover safe to assume that changes in goodwill and related effects on equity and income will in the future occur in a more discrete, volatile fashion and will, in line with the expected returns from the acquired or merged unit, behave cyclically. It is likely that during a recession, goodwill positions will evaporate faster from banks' balance sheets than under the current long-term amortisation schedules.

An interesting feature of possible one-off effects is that in principle, IFRS 3 accounting can be, but does not have to be, applied to past acquisitions, which means that the original goodwill could be reactivated, undoing past amortisation through profit and loss with corresponding effects on income and, most notably, on book equity.

Goodwill accounting clearly influences indicators that are based on equity and assets, and changes in the amortisation of goodwill influence earnings. However, regulatory own funds will not be affected because the definition of own funds excludes intangible assets. Furthermore, goodwill is not risk-weighted and thus does not affect the numerator of the solvency ratio. Consequently, the solvency ratio remains unaffected by changes in goodwill accounting. For instance, a one-off increase in reported goodwill at the first-time application of IFRS would increase shareholders' equity; however, for the own funds, the effect is eliminated because of an increase in the deductions from the own funds of the same amount.

<sup>4</sup> This is also referred to as pooling of interest accounting.

## FINANCIAL INSTRUMENTS

### DERIVATIVES

IFRS require all derivatives to be recognised on the balance sheet and measured at fair value. Gains and losses from changes in the fair value will flow through the income statement, with the exception of derivatives qualified for hedging (see section on hedging provisions). Prior to the adoption of IFRS, derivatives held for trading were already valued at fair value in many European countries and recognised on the balance sheet. However, this is a new feature for derivatives recognised in the banking book, as these were formerly only registered off-balance sheet at cost.

Additionally, derivatives that are embedded in hybrid financial instruments, but which have economic characteristics and risks that are not closely related to the economic characteristics of the underlying financial instrument, are required to be separated from the hybrid instrument, to be valued at fair value and recognised on the balance sheet on a stand-alone basis.

The recognition of derivatives at fair value will result in an increase in the overall size of the balance sheet. Furthermore, changes in the fair value will cause additional volatility in the income statement and, therefore, also in equity. However, it should be stressed that the recognition of derivatives on the balance sheet at fair value, as opposed to the current situation of generally simply being registered off-balance sheet, can be considered a significant step forward for users of financial statements, as it increases understanding of the underlying risks incurred by banks which may be dealing with and exposed to derivatives transactions on a large scale.

### AVAILABLE-FOR-SALE SECURITIES

Under IFRS, available-for-sale (AFS) securities are required to be recorded at fair value. Under certain national accounting rules, AFS securities could include long-term investments which were carried at cost, less

provisions for impairment. For these assets, the introduction of IFRS seems, in most cases and at this juncture, to result in an increase in value from the recognition of these assets at fair value.<sup>5</sup> The increase from cost to fair value will be recognised in a specific reserve of shareholders' equity. Hence, this increased use of fair value for AFS securities may potentially result in an increase in the overall asset size of the balance sheet and in an increase in the volatility of equity.

The accounting treatment of AFS securities has indeed prompted banking supervisors to develop a prudential filter to neutralise the effect on regulatory capital (see section on the impact on regulatory capital).

### HEDGING PROVISIONS

Hedge accounting rules allow the hedging item to follow the accounting treatment of the hedged item, which is generally known as accruals accounting. Under this treatment, the gain or loss on the hedging instrument is recognised in the income statement when the offsetting gain or loss on the hedged instrument is recognised. Hence, given the possibility to defer or anticipate income recognition, strict requirements need to be complied with in order to qualify for hedge accounting so as to prevent discretionary income manipulation by management. To qualify for hedge accounting, IFRS require, inter alia, specific identification and documentation of the hedging and hedged instruments, identification of the risk being hedged, and effectiveness testing of the hedge itself. IFRS also allow macro-hedging (on a portfolio basis) in a fair value hedge for interest rate risk.

IFRS distinguish between two main types of hedges: cash-flow hedges and fair value hedges. Cash-flow hedges aim to cover the risk of variability of future cash flows (e.g. variable rate financial instruments), and the valuation of

<sup>5</sup> Fair values can be higher or lower than amortised cost, depending on the changes in interest rates and the amount that the asset was recognised as on the balance sheet.

the hedging derivative is recognised at fair value in shareholders' equity. As the gains and losses from the changes in the fair value of the hedged instrument are recognised in the income statement, the fair value of the hedging instrument recognised in equity is adjusted and the corresponding gains and losses are "recycled" through the income statement. It should be noted that the accounting treatment of cash-flow hedges was also subject to a prudential filter to safeguard the quality of regulatory capital (see section on the impact on regulatory capital).

Fair value hedges are designed to cover changes in the price of a financial instrument. This can be accomplished by hedging the transaction (micro hedging) or on a portfolio basis (macro hedging). Under micro fair value hedging, changes in the fair value of the derivative and changes in the fair value of the hedged item are recognised in the income statement symmetrically. For macro hedging, the change in the fair value of the hedged item is recognised in the balance sheet on a separate line item.

Hedge accounting rules were in place prior to the introduction of IFRS. However, the IFRS criteria seem to be tighter than existing national hedging rules. Therefore, some existing hedging relationships may fail to comply with the IFRS hedging criteria, and thus will no longer qualify for hedge accounting, which may subsequently result in artificial volatility in net income.

#### **FAIR VALUE OPTION**

The new accounting rules introduce the possibility to designate irrevocably at inception a financial asset or financial liability as at fair value through profit and loss – the so-called fair value option. However, this option may only be applied if: (i) it eliminates or significantly reduces a measurement or recognition inconsistency (sometimes referred to as an accounting mismatch), or (ii) when a group of financial assets, financial liabilities or

both is managed and its performance is evaluated on a fair value basis in accordance with a documented risk management strategy.<sup>6</sup>

Although the introduction of this option may increase the use of fair value, which could potentially entail additional volatility in net income from the changes in the fair value, it also allows the elimination of an accounting mismatch of an economically hedged position (thus reducing "artificial" volatility).

#### **SHARE-BASED PAYMENTS**

Under IFRS, banks are required to recognise in their income statements the fair value of share options and other share-based payments awarded by banks to their employees and executives. Under current rules there is no such requirement, and such share-based payments are kept off-balance sheet. This expense will have a one-off negative impact on net income.

#### **ALLOWANCES FOR CREDIT LOSSES**

Loans are traditionally recognised on the balance sheet at cost. Banks have some discretionary leeway in classifying certain loans as doubtful or non-performing, and in calculating the related provision for loan losses, which could be either general or specific. Specific provisions cover losses on individual or on a portfolio of loans which have been specifically identified as impaired or non-performing. The nature of general provisions varies significantly across Member States, from statistically supported allowances for losses inherent in the loan portfolio to country risk reserves or reserves for general banking risks (which are not associated with an impairment).

Under IFRS, banks will be required to assess at each balance sheet date whether there is objective evidence that the loan or group of loans is impaired. An impairment loss should

<sup>6</sup> See IAS 39 "Financial Instruments: Recognition and Measurement", Amendment to IAS 39 for Fair Value Option, June 2005.

be recorded when it is probable that the bank will not receive the payment of interest and principal according to the original contractual terms. The amount of the loss is the difference between the carrying amount and the net present value of expected future cash flows discounted at the loan's original interest rate. This loss, recognised as an allowance for loan losses, will flow through profit and loss. In addition, for collateralised loans, banks will need to recognise collateral at fair value.

The recording of impairment losses will increase the potential pro-cyclical effects on banks' profit and loss. Furthermore, these new rules may result in a reduction in the overall level of allowances for credit losses, as banks will only be allowed to create reserves<sup>7</sup> to cover losses which have been incurred. This need not, however, lead to insufficient provisions. The new rules require a two-step assessment of incurred credit losses, whereby loans are assessed individually and collectively. An individual loan which has been determined as not impaired is included in a group of loans with similar credit risk characteristics for collective impairment assessment. The process considers all credit exposures, not only those of low credit quality. Where observable data are limited, the new rules require the use of experienced judgement in the estimation process. A potential reduction in the allowance expense for credit losses will have a positive impact on net income.

#### POST-EMPLOYMENT BENEFITS

Pensions are the most significant position in the category of post-employment benefits under the IFRS. In this context, a pension plan asset or liability is recognised on the balance sheet only if the employer bears the investment and actuarial risks of the pension plan. If this is the case (e.g. in the case of defined benefit schemes), either a net asset or a net liability is reported, based in principle on the difference between the fair value of pension plan assets and the actuarial, discounted present value of future pensions.

The one-off effects of the first-time application of IFRS can basically materialise in three different respects. First, pension plan assets and liabilities may currently not be recognised on the balance sheet at all, even though the plan is of a defined benefit nature. In these instances, the one-off expense and the additional liability appearing on the balance sheet will obviously be significant and will strongly influence both income-based indicators and capital ratios. However, even if currently applicable rules require the recognition of pension liabilities, it is likely that the amount of the liabilities will increase under IFRS, given that the actuarial factors to be accounted for are rather extensive compared to the often less binding or limited guidance given by national rules. Second, the measurement of the pension plan assets may in certain cases produce precisely the opposite effect. Where pension plan assets were not designated as such in the past under national accounting rules and did not offset pension liabilities, the effect may be that the net liability under IFRS is actually lower than the liability currently reported, implying a positive effect on income and equity in the transition to IFRS. Third, a similar situation may also arise when there are considerable hidden reserves in pension plan assets that would be disclosed and netted against pension plan liabilities upon first-time application.

With regard to ongoing effects, it can be assumed that the measurement of pension plan assets at fair value and the relatively stringent actuarial methods in connection with the requirement to update regularly the calculations will tend to lead to increased volatility of profit and loss compared to measurement under most of the current national rules. However, it should be noted that if actuarial gains or losses exceed certain thresholds, IFRS allow them to be spread at maximum over the average remaining service period of the employees, which would

<sup>7</sup> The term "reserve" is meant as a provision or allowance in the context of loan impairment.

contribute to smoothing their impact on net pension assets or liability and on profit and loss. There is also the possibility that firms might try to avoid these effects on their balance sheets in the medium term by increasingly opting for defined contribution pension schemes.

### **SPECIAL PURPOSE ENTITIES**

The main issue in this context is whether the assets and liabilities of a special purpose entity (SPE) should be included in the individual accounts of a bank, and whether the SPE needs to be consolidated. SPEs are of particular relevance in the banking sector because they are used as a conduit for securitisations of banks' assets such as credit portfolios (in such cases, the bank sells the assets to an SPE that has issued securities, and pays those assets with the proceeds from this issuance). While ideally such a transaction, also referred to as a "true sale", would insulate the bank from the risks and returns of those assets and would thus justify their de-recognition from the bank's balance sheet, there are various issues that imply continued risks for the selling bank, such as retained tranches of the securitisation or implicit support for the SPE. Other potential uses of SPEs for banks include the selling of non-core activities such as real estate holdings.

IFRS contain specific provisions on securitisation. The possibility that securitised assets may be de-recognised from the bank's balance sheet requires a case-by-case analysis. As a first step, it needs to be analysed whether the bank bears the risks and returns of the assets. The level of control the bank has over the SPE also has to be assessed. Consolidation as opposed to inclusion in individual accounts is, by contrast, required if the bank controls the SPE, i.e. when it has for instance the ability to appoint its management or issue orders to the SPE.

In some cases IFRS appear somewhat more concrete and binding than some current national accounting principles (for instance the

German and French). Others (for instance the Dutch and British) are more similar to IFRS. Consequently, it is likely that in the first cases (but rather not in the latter) that some SPEs will need to be included in the individual and/or consolidated accounts for the first time. This assessment is obviously a static one in the sense that IFRS also allow SPEs in principle to be structured in a way that they do not have to be included. Consequently, some reporting entities may choose to restructure transactions rather than to recognise them on their balance sheets.

In those cases where existing, off-balance sheet SPEs need to be included on the balance sheet, there will be a one-off increase in assets and liabilities and a consequent change in return on total assets and in the debt-to-equity ratio. Solvency ratios, by contrast, would remain unaffected as the capital treatment of the securitised assets and the retained tranches depends on the respective prudential rules, irrespective of the accounting treatment.

### **DIVIDEND ADJUSTMENT**

Under national accounting rules, dividends are recognised as soon as they are declared. However, under IFRS dividends are only recognised later when approved and not when initially declared. This results in a positive adjustment in equity for year-end accounts. However, this adjustment is temporary, given that it will be corrected for in interim accounts, when the declared dividends are effectively approved for distribution. This adjustment is particularly large for some countries.

### **SOFTWARE DEVELOPMENT COSTS AND OTHER INTANGIBLES**

According to most current national accounting rules, banks have the option either to expense or to capitalise certain software development costs. Under IFRS, these internally developed software and other intangible assets can be capitalised and amortised, but only if certain conditions are met. Therefore, for banks which

had previously chosen to expense their software development costs, the transition to IFRS and the retroactive application of this rule would imply an increase in the asset size of the balance sheet from the capitalisation of these costs and an increase in equity from the related positive adjustment.

However, the annual amortisation of these costs, which are normally amortised over a short period of time, will subsequently, at year-end, have a negative effect on the income statement.

### PRUDENTIAL FILTERS

The impact of the application of the new accounting standards may in certain cases be significant on equity and on the income statement. Given that these accounting figures are normally used as the basis for prudential reporting, banking supervisors deemed it necessary to develop some prudential filters.

Prudential filters are designed to maintain the current definition and quality of regulatory capital. It should be noted that with the objective of maintaining a level playing-field across the EU and G10 countries, the prudential filters proposed by the Committee of European Banking Supervisors are consistent with those of the Basel Committee on Banking Supervision.

A brief description of some of these prudential filters is provided below; a detailed description of all the prudential filters developed by the above-mentioned committees can be found on their respective websites.<sup>8</sup>

### OWN CREDIT RISK

Banking supervisors advise the exclusion from regulatory capital of any cumulative unrealised gains and losses arising from changes in an institution's own credit standing – so-called own credit risk – as a result of the potential future application to liabilities of the fair value option. When issued liabilities are recognised at fair value in a bank's balance sheet, a

deterioration in the bank's credit quality leads to an increase in the discount, which results in a reduction in the value of the liabilities and in turn to the recognition of an accounting gain. Conversely, an improvement in the bank's creditworthiness leads to an increase in the fair value of the liabilities (discounted at a lower rate), which results in the recognition of an accounting loss. Banking supervisors advise that these gains and losses should be extricated from regulatory capital.

### CASH-FLOW HEDGES

It is recommended that fair value reserves related to cash-flow hedges of financial instruments measured at amortised cost should not be included in regulatory capital, given that this fair value reserve will be subsequently adjusted and the related gains and losses recognised through profit and loss.

### AVAILABLE-FOR-SALE PORTFOLIO

The AFS portfolio comprises equities, loans and receivables and other financial instruments. For equities, unrealised losses should be deducted from regulatory capital (more specifically from tier one), while unrealised gains should only partially be included (in tier two). For loans and receivables, unrealised gains and losses – apart from those related to impairment – are not recognised in regulatory capital. Other AFS assets are either treated as equities or as loans and receivables.

### CONCLUDING REMARKS

To sum up, the changeover from national accounting rules to IFRS may raise issues of interpretation or comparison in the near future. This is particularly true at the EU-wide macro level, given that the concrete nature and size of the effects from the transition to IFRS will depend on both the pre-existing national rules in each Member State and the current practices and specific features of individual firms that have been applying the national rules. From a

<sup>8</sup> [www.c-eps.org](http://www.c-eps.org) and [www.bis.org/bcbs/index.htm](http://www.bis.org/bcbs/index.htm).



financial stability perspective, however, such issues that may arise during the initial phase of the changeover to IFRS are only temporary in nature and by no means outweigh the long-term benefits of an accounting regime which is both more harmonised and better reflects the underlying risks that an individual firm is exposed to. The application of the new accounting rules across individual institutions in different Member States clearly benefits cross-country comparisons and aggregation, which in turn results in cross-country macro-prudential indicators that are more meaningful in the longer term.

## F CENTRAL COUNTERPARTY CLEARING HOUSES AND FINANCIAL STABILITY

*Central counterparty clearing houses (CCPs) play an important role in efficiently reallocating counterparty credit risks and liquidity risks in financial markets. However, as systemically important players, they must manage their risks in an adequate way in order to avoid creating new risks for financial stability.*

### INTRODUCTION

In financial markets, the clearing of transactions involves the calculation, usually on a net basis, of the obligations of market participants that result from their trading activities. Clearing takes place after the matching of buy and sell orders and prior to the legal fulfilment of the respective obligation. In many markets, clearing is performed by a CCP, in which case the CCP interposes itself between the original buyer and seller, acting as the buyer to each seller and the seller to each buyer. In recent years, CCPs have been playing an increasingly important role in the clearing of transactions in financial markets. In particular, against a background of rising trading volumes, derivatives and repo markets have become heavily reliant on CCPs for the clearing of transactions. In addition, CCPs have been increasingly serving outright securities markets, including OTC markets. In many major markets, traders are obliged to use a CCP to clear all of their trades, either as direct or indirect participants of the CCP.

CCPs can play an important role in the functioning of financial markets, as they have the potential to reduce the counterparty credit risks that financial market participants face when they enter into transactions. In addition, they can contribute to improving efficiency in financial markets by providing multilateral netting of trades and by facilitating anonymous trading. However, because a CCP also concentrates risks, significant disruptions in the financial markets that they serve could arise

if the risk management procedures they have in place prove inadequate. Thus, a CCP's risk management procedures play a crucial role in safeguarding financial stability.

This Special Feature discusses the ways in which the core functions of CCPs can contribute to financial stability. It also describes the risks that CCPs are exposed to, and what CCPs can, or should, do to manage such risks appropriately.

### COUNTERPARTY CREDIT RISK AND LIQUIDITY RISK

Transactions in the financial markets involve a trading phase and one or more settlement phases. The trading phase is the moment when two parties conclude an agreement. In an outright securities transaction, for example, the parties agree to exchange securities for funds typically within one or two days. In the case of derivatives transactions, for example a futures contract, the parties will agree to exchange the underlying security for funds at a later (expiry) date. And in the case of a repurchase agreement, the parties agree to exchange the underlying security for funds within one or two days and to redeliver the underlying security at a later date.

The settlement phases of a transaction are when obligations from the trading phase are fulfilled, i.e. when assets are exchanged for funds and – in the case of a repurchase agreement – redelivered when due. Outright transactions are characterised by a single settlement phase, while for example repurchase transactions have two settlement phases, first as assets are delivered, and then as they are redelivered later on.

There is a time-lag between the trading and the settlement phases in particular for derivatives and repurchase transactions, and even in the case of outright transactions. This time-lag appears to be the main reason why the two parties in a transaction are exposed to counterparty credit risk and to liquidity risk.

Counterparty credit risk is the risk that one party in a transaction is unable to fulfil its obligations, typically as a consequence of insolvency between the trading and the settlement phase. Liquidity risk is the risk that the trading party cannot fulfil its obligations when due, but only with a delay, for example because of operational problems.

Nowadays, the settlement of cash market transactions typically takes place in DVP mode; i.e. when assets are to be exchanged for funds, the assets are delivered if and only if the funds are delivered. Accordingly, the risk that the non-defaulting trading party delivers to a defaulting party while the defaulting party does not deliver to the non-defaulting party (so-called principal risk) should be negligible, so that the non-defaulting party should not lose the full principal value of the assets or funds delivered.

However, counterparty credit and liquidity risks can still imply significant losses for the non-defaulting party. For example, if the non-defaulting party urgently needs the assets that the defaulting party failed to deliver, it has to replace the failed trade by a new one. The price of the new trade can however be less favourable than that of the failed trade.

Counterparty credit risk and liquidity risk can pose risks for financial stability, especially through a domino effect. For instance, suppose that two parties, *A* and *B*, conclude a trade and that *A* fails to deliver. *B*, however, in the expectation of receiving assets from *A*, may in the meantime have assumed in another trade the obligation to deliver the assets to a third party *C*. The failure of *A* may then also entail a failure of *B* to deliver to *C*, and so on.

#### REALLOCATION OF RISKS BY CCPs

In order to limit the potential impact of counterparty credit and liquidity risks, CCPs have been established in many financial markets. A CCP is a special purpose entity that interposes itself between the buyer and the

seller in a securities transaction, acting as the seller to the buyer and as the buyer to the seller. In the simple case of an outright securities transaction, the seller must deliver the securities when settlement is due to the CCP rather than to the buyer. Similarly, the seller receives the funds from the CCP, the buyer delivers the funds to the CCP, and receives the securities from the CCP. In doing so, the CCP assumes the counterparty credit and liquidity risk from the trading parties. If, for example, the buyer fails to pay, then the CCP must still settle the transaction with the seller, while the transaction between the buyer and the CCP is cancelled or settlement is postponed. Hence, the seller will not be affected by a default of the buyer. The CCP thus acts as guarantor for the fulfilment of obligations from trades.

Historically, most CCPs tended only to be found in derivatives and repo markets, as the time-lag between the trading and the settlement phase is longer in these markets than in outright securities markets. This longer time-lag implies that the risk of one party becoming insolvent before settlement (the counterparty credit risk) is also greater in derivatives and repo markets than in outright markets.<sup>1</sup> However, many CCPs have recently started serving outright securities markets as well.

It should be noted that CCPs do not eliminate counterparty credit risk and liquidity risk; instead, they reallocate it. The risk that, for example, the buyer will not be able to fulfil its obligations will now be borne by the CCP rather than by the seller. The seller is only left with the risk that the CCP cannot fulfil its obligations towards the seller. However, CCPs specialise in managing exposure to counterparty credit and liquidity risks. If adequate procedures are in place, then they are in a better position than the trading partners behind the transactions to cope with such risks.

<sup>1</sup> On the other hand, liquidity risk may under certain circumstances decline as the time-lag between the trading and settlement phase increases. A greater time-lag gives a trading party which is short in an asset that it has to deliver more time to close its position.

CCPs are therefore expected to reallocate these risks in an efficient way, thereby contributing to financial stability.

### RISKS AND RISK MITIGATION IN CCP CLEARING

To ensure that CCPs do indeed contribute to financial stability, it must be ensured that they cannot default on their own obligations. CCPs should and indeed do use various measures to this end, some of which are discussed below.

#### FINANCIAL RESOURCES

Suppose that two parties, *A* and *B*, conclude an outright trade according to which at settlement day, *A* has to deliver assets to *B* and *B* has to make a payment to *A*. If there is a CCP interposed between *A* and *B*, and *A* now defaults, then the CCP is released from the obligation to make a payment to *A*, although it will not receive assets from *A* either. Despite this, the CCP is obliged to deliver the assets to *B* (and *B* has to make a payment to the CCP). To fulfil its obligation towards *B*, the CCP might now have to buy the assets in the market from a third party. However, the price of the assets may in the meantime have increased so that the CCP will incur a loss. To avoid the risk that

such losses could result in insolvency and, as a consequence, that CCPs could default on their own obligations, CCPs typically use a variety of financial resources for protection.

As a first line of protection, CCP participants are normally subject to margin requirements, i.e. they must post collateral in the form of cash or other assets. Several types of margins can be distinguished, depending on how margins are determined. *Initial margins*, for example, are margins that are to be posted to the CCP when a participant opens a position, for example when it buys a futures contract. The amount to be posted typically depends on the volatility of the respective futures price. If the participant defaults, then the CCP uses the margins posted by the defaulting participant as compensation for its losses from such a default. *Variation margins* are margins that are to be posted when the price of an earlier opened position varies. Participants whose positions have lost value will post collateral to the CCP; the CCP then passes the collateral on to participants whose positions have gained in value. A stylised example of the variation margining process for a futures contract is provided in Box F.1 below.

#### Box F.1

##### STYLISED EXAMPLE OF A TYPICAL LIFECYCLE OF A FUTURES CONTRACT WITH AND WITHOUT VARIATION MARGINING

Consider a derivatives exchange that offers the trading of a futures contract. The first trading day is Day 1, the last trading day and delivery day is Day 3. The underlying security is a government bond. A CCP clears all trades on the exchange.

Three parties ( $B_1$ ,  $B_2$  and  $S$ ) trade the futures contract. On Day 1,  $B_1$  buys 10,  $B_2$  buys 20 and  $S$  sells 30 contracts. For simplicity, it is assumed that throughout the day the price of the contract remains  $f_1$ . Thus, the CCP buys 30 contracts from  $S$  and sells 10 to  $B_1$  and 20 to  $B_2$  at price  $f_1$  respectively. At the end of Day 1,  $B_1$  has a long position of 10 contracts,  $B_2$  has a long position of 20 contracts and  $S$  has a short position of 30 contracts.

On Day 2,  $B_1$  sells 10 contracts and  $S$  buys 10 contracts while  $B_2$  does not trade. Again, it is assumed that the price of the contract remains the same throughout Day 2, now at  $f_2$ . Thus, the CCP buys 10 contracts from  $B_1$  at  $f_2$  and sells 10 contracts to  $S$  at  $f_2$ . At the end of Day 2,  $B_1$  has

accordingly closed its position,  $B_2$ 's position remains unchanged, and S has reduced its short position by 10 to 20 contracts.

The contract is not traded on Day 3. The price of the government bond is  $f_3$ . The futures contract stipulates that any trader with a long position of  $x$  at the end of Day 3 will receive  $x$  bonds from the CCP, while any trader with a short position of  $y$  must deliver  $y$  bonds to the CCP.

Table F.1.1 shows the asset value flows in a case where variation margining is not applied and where there are no defaults. On Day 1,  $B_1$  pays  $10f_1$  and  $B_2$  pays  $20f_1$  to the CCP, while the CCP pays  $30f_1$  to S. The flows for Day 2 are interpreted in a similar way. On Day 3, S must deliver 20 bonds to the CCP. As the price of the bond is  $f_3$ , this implies an asset value flow of  $20f_3$  from S to the CCP. Finally, the CCP must deliver 20 bonds to  $B_2$ .

Now consider again a case where the CCP does not apply variation margining, but S defaults after Day 2 and thus cannot fulfil any obligations on Day 3, thus obliging the CCP to step in. The resulting asset value flows are presented in Table F.1.2. The CCP now makes a loss of  $20f_3$ . As compensation, it can now claim the initial margins posted by S when S opened its position on Day 1. However, the calculation of the initial margins was based on the price  $f_1$  of Day 1. If  $f_3$  is significantly higher than  $f_1$ , then the initial margins may not be sufficient to cover the CCP's losses.

Tables F.1.3 and F.1.4 show the effects of introducing variation margining. On Day 1, no asset flows occur (except for initial margins which are not considered in the tables). On Day 2,  $B_1$  pays  $10(f_1-f_2)$  to the CCP. If S defaults after Day 2 so that it cannot fulfil its obligations, then the CCP realises a gain of  $20(f_2-f_3)$  which is negative (a loss) if  $f_2$  is smaller than  $f_3$ . A comparison of the situations described in Table A.2 and in Table A.4 shows that variation margining reduces the CCP's potential losses.

**Table F.1.1 Net asset value flows without variation margining, no default**

	Day 1	Day 2	Day 3	Sum
$B_1$	$-10 f_1$	$10 f_2$	0	$-10 (f_1-f_2)$
$B_2$	$-20 f_1$		$20 f_3$	$-20 (f_1-f_3)$
S	$30 f_1$	$-10 f_2$	$-20 f_3$	$30 f_1 - 10 f_2 - 20 f_3$
CCP	0	0	0	0

**Table F.1.2 Net asset value flows without variation margining, S defaults after Day 2**

	Day 1	Day 2	Day 3	Sum
$B_1$	$-10 f_1$	$10 f_2$	0	$-10 (f_1-f_2)$
$B_2$	$-20 f_1$	0	$20 f_3$	$-20 (f_1-f_3)$
S	$30 f_1$	$-10 f_2$	0	$30 f_1 - 10 f_2$
CCP	0	0	$-20 f_3$	$-20 f_3$

**Table F.1.3 Net asset value flows with variation margining, no default**

	Day 1	Day 2	Day 3	Sum
$B_1$	0	$-10 (f_1-f_2)$	0	$-10 (f_1-f_2)$
$B_2$	0	$-20 (f_1-f_2)$	$-20 (f_2-f_3)$	$-20 (f_1-f_3)$
S	0	$30 (f_1-f_2)$	$-20 (f_2-f_3)$	$30 f_1 - 10 f_2 - 20 f_3$
CCP	0	0	0	0

**Table F.1.4 Net asset value flows with variation margining, S defaults after Day 2**

	Day 1	Day 2	Day 3	Sum
$B_1$	0	$-10 (f_1-f_2)$	0	$-10 (f_1-f_2)$
$B_2$	0	$-20 (f_1-f_2)$	$-20 (f_2-f_3)$	$-20 (f_1-f_3)$
S	0	$30 (f_1-f_2)$	0	$30 (f_1-f_2)$
CCP	0	0	$20 (f_2-f_3)$	$20 (f_2-f_3)$

Margins are collateral posted by a CCP participant and are used by the CCP in case this participant defaults. As a second layer of protection, many CCPs use clearing funds. A clearing fund is a pool of collateral to which every participant contributes. Thus, it constitutes a type of mutual insurance. If the CCP is forced to have recourse to the clearing fund, then all participants will share in the losses incurred by the CCP.

Some CCPs buy insurance against losses from defaulting participants or have contingent claims on a participant's resources or on the resources of a participant's parent company. Finally, if all other layers are exhausted, the CCP's own capital must counterbalance all remaining losses. The CCP should therefore have sufficient own capital to cope with extreme losses.

#### Credit lines and liquidity of financial resources

When a CCP participant defaults and the CCP is forced to step in instead, the obligations that arise from the participant's default must be fulfilled in a timely manner. Ideally, the assets that the CCP must deliver to the non-defaulting participants are already part of the CCP's financial resources. If this is not the case, then it is important that the CCP can easily buy or borrow the assets in the market. An adequate part of the CCP's financial resources should therefore be sufficiently liquid to be used to buy any required assets or to be used as collateral to borrow them. Sufficient credit lines should allow the CCP to borrow what it needs.

The way in which CCPs hold financial resources not only determines whether they can fulfil all obligations that arise owing to defaulting participants in a timely manner, but also determines the extent to which they can incur losses from investments. Risky assets expose CCPs to additional risks. It may, for example, be appropriate that CCPs hold cash positions mainly in central bank money, i.e. on accounts with a central bank.

#### Participation requirements and limits

To a certain extent, it might be advisable to restrict participation in a CCP by imposing participation requirements. Institutions that are characterised by a relatively high probability of default, for example because they are undercapitalised, may be excluded from participation in a CCP. At the same time, position limits may be in place, i.e. limits on the amount that the CCP is ready to guarantee.

Setting the optimal level of participation requirements and limits is a difficult task. If they are too demanding, then too few trades will be cleared through the CCP, and market participants will then be exposed to counterparty credit and liquidity risks. Most CCPs, however, allow their participants not only to clear their own obligations through the CCP, but also those of market participants which do not participate directly in the CCP.<sup>2</sup>

#### Operational procedures

Finally, it is important to note that CCPs rely on technologically sophisticated procedures for transferring assets from, or to, participants and for calculating collateral requirements. This not only involves procedures operated by the CCP, but also those of cash and securities settlement systems. All of these procedures must be operationally reliable. This is especially important given that many transactions are cleared and settled "straight through", i.e. automatically in a central routine procedure. If such a procedure fails, major – though hopefully only temporary – disruptions of financial markets could ensue. Business contingency facilities should support the operational reliability of the CCP.

#### CONCLUDING REMARKS

As CCPs are now starting to serve an increasing number of markets – including outright securities markets – their systemic importance

<sup>2</sup> CCP participants that are able to clear only their own obligations are often called "individual" or direct clearing members, whereas those that are also able to clear obligations of their clients are typically called general clearing members.

has grown in recent years. Additionally, consolidation has significantly reduced the number of CCPs in Europe<sup>3</sup>, leading to a concentration of more risk in each of the remaining CCPs. Insolvency or operational problems of a CCP could therefore lead to severe disruptions in the financial markets.

CCPs apply sophisticated risk management measures and are highly regulated by public authorities. However, in an ever-changing environment, new risks may occur that must be detected in time and adequately monitored.

<sup>3</sup> See Section 6.

## STATISTICAL ANNEX

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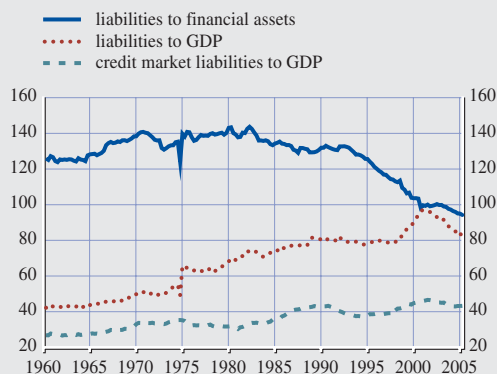


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# I EXTERNAL ENVIRONMENT

**Chart S1 US non-farm, non-financial corporate business liabilities**

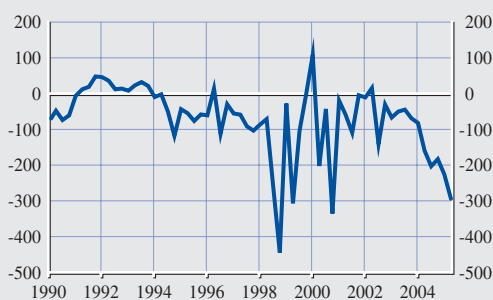
(Q1 1960 - Q2 2005, %)



Sources: US Federal Reserve Board and Bureau of Economic Analysis.

**Chart S2 US non-farm, non-financial corporate business net equity issuance**

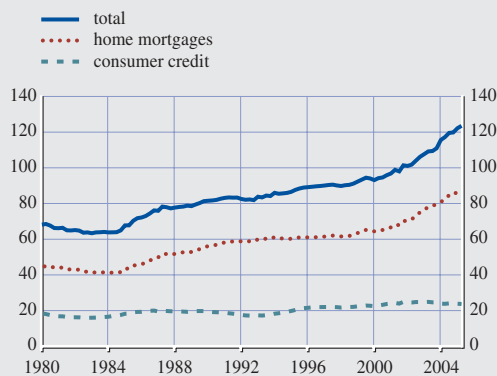
(Q1 1990 - Q2 2005, USD billions, seasonally adjusted quarterly annualised data)



Source: US Federal Reserve Board.

**Chart S3 US household debt-to-disposable income ratio**

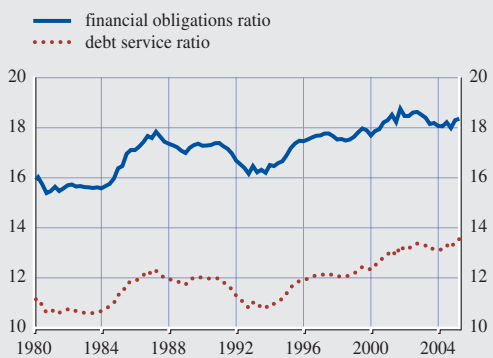
(Q1 1980 - Q2 2005, % of disposable income)



Source: US Federal Reserve Board.

**Chart S4 US household debt burden**

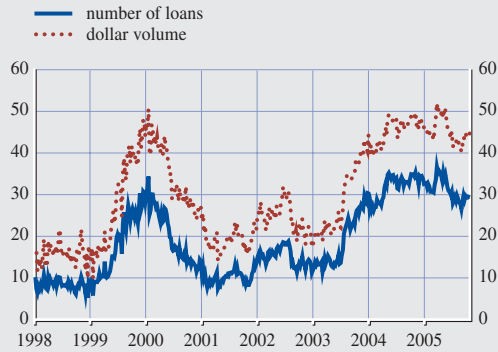
(Q1 1980 - Q2 2005, % of disposable income)



Source: US Federal Reserve Board.

**Chart S5 Share of adjustable rate mortgages in the US**

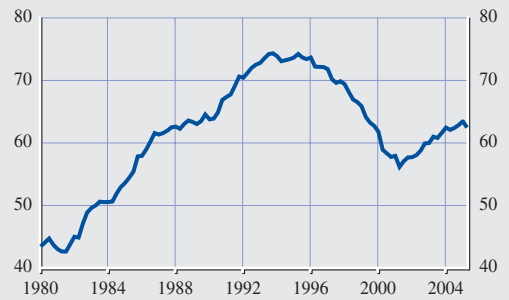
(Jan. 1998 - Oct. 2005, % of total new mortgages)



Source: Mortgage Bankers Association.

**Chart S6 US general government debt-to-GDP ratio**

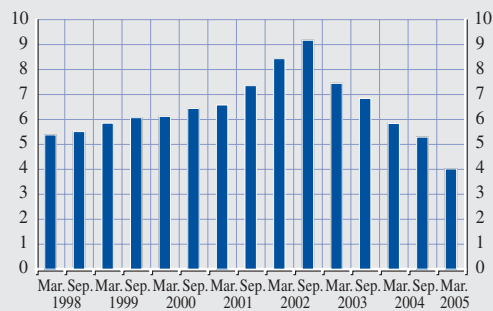
(Q1 1980 - Q2 2005, %)



Source: US Federal Reserve Board.  
Note: This refers to the consolidated federal, state and local government debt.

**Chart S7 Japanese banks' non-performing loans**

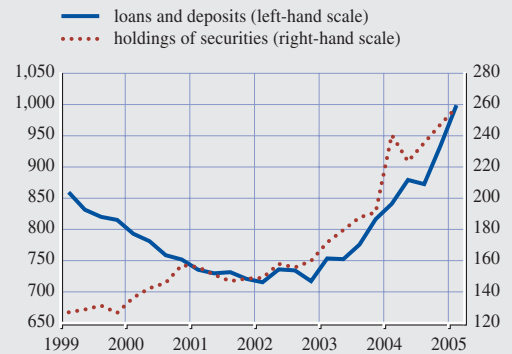
(Mar. 1998 - Mar. 2005, % of total loans)



Source: Japan Financial Services Agency.

**Chart S8 International positions of all BIS reporting banks vis-à-vis emerging markets**

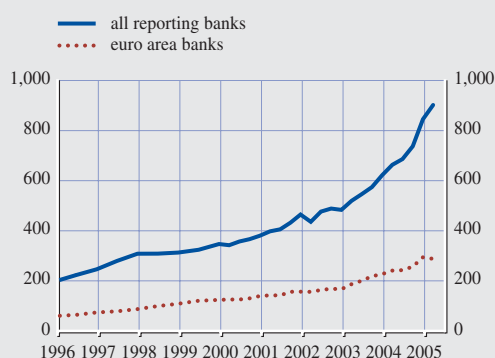
(Q1 1999 - Q1 2005, USD billions)



Source: Bank for International Settlements (BIS).

**Chart S9 Consolidated claims on non-banks in offshore financial centres**

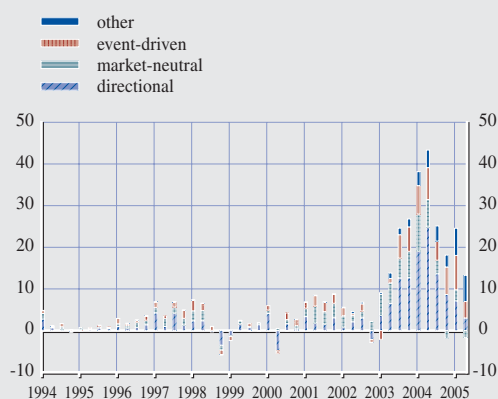
(Q1 1996 - Q1 2005, USD billions)



Source: BIS.

**Chart S10 Hedge fund inflows**

(Q1 1994 - Q2 2005, USD billions)


 Source: TASS Research.  
Note: Excluding funds of hedge funds.

**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)	
	2002	2005(e)	2002	2005(e)	2002	2005(e)	2002	2005(e)
<b>Latin America</b>								
Argentina	8.5	1.0	157	73	170	57	5.3	6.8
Brazil	-1.7	1.7	50	27	65	31	5.4	5.7
Chile	-0.9	0.6	60	38	36	42	7.4	4.2
Colombia	-1.7	-1.5	46	34	17	19	6.9	6.2
Mexico	-2.1	-1.3	25	23	71	50	3.0	3.2
Venezuela	8.2	15.3	41	30	78	29	4.6	6.3
<b>Asia</b>								
China	2.7	6.7	13	13	16	12	9.9	13.4
India	1.2	-1.3	23	19	18	14	9.8	8.8
Indonesia	3.9	1.6	66	45	54	51	6.0	4.7
Malaysia	7.6	10.0	52	58	25	26	4.1	7.0
South Korea	1.0	2.3	26	24	41	31	7.6	7.7
Thailand	5.5	-2.5	47	30	31	28	5.8	4.2
<b>Emerging Europe</b>								
Russia	8.0	5.7	42	31	56	40	6.9	11.4
Turkey	-0.8	-5.1	69	48	78	141	5.2	3.8

 Source: Institute of International Finance.  
Note: Data for 2005 are estimates.

## 2 INTERNATIONAL FINANCIAL MARKETS

**Chart S11 Nominal broad USD effective exchange rate index**

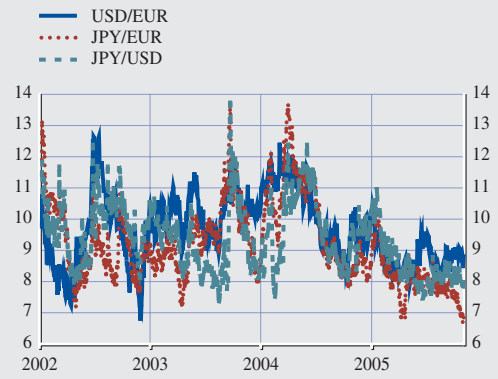
(Jan. 2002 - Oct. 2005, index: Jan. 2002 = 100)



Source: US Federal Reserve Board.

**Chart S12 One-month implied volatility for USD/EUR, JPY/EUR and JPY/USD**

(Jan. 2002 - Nov. 2005, %)



Source: Reuters.

**Chart S13 US risk aversion index**

(Jan. 1990 - Oct. 2005)



Source: Goldman Sachs.

Note: The risk aversion index ranges between 0 and 10, and measures investors' willingness to invest in risky assets as opposed to risk-free securities.

**Chart S14 Stock prices in the US**

(Jan. 2002 - Nov. 2005, S&P 500, index: Jan. 2003 = 100)



Source: Reuters.

**Chart S15 Price-earnings (P/E) ratio for the US stock market**

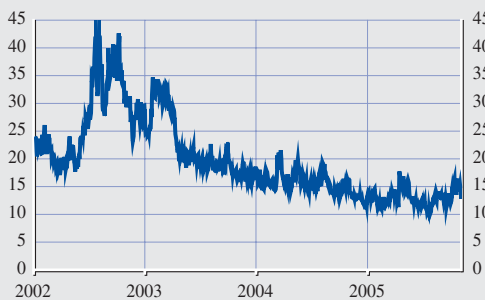
(Jan. 1983 - Nov. 2005, %, ten-year trailing earnings)



Sources: Thomson Financial Datastream and ECB calculations.  
Note: The P/E ratio is based on prevailing stock prices relative to an average of the previous ten years of earnings.

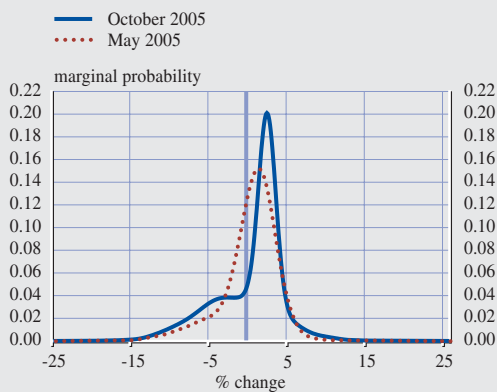
**Chart S16 VIX implied volatility for the S&P 500 index**

(Jan. 2002 - Nov. 2005, %)



Source: Thomson Financial Datastream.  
Note: Data calculated by the Chicago Board Options Exchange (CBOE).

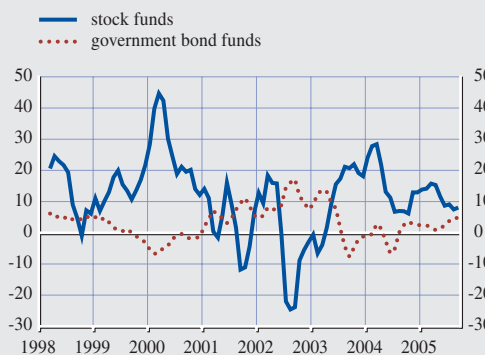
**Chart S17 Option-implied probability distribution function for the S&P 500 index**



Sources: Bloomberg and ECB calculations.

**Chart S18 US mutual fund flows**

(Mar. 1998 - Sep. 2005, USD billions, three-month moving average)



Source: Investment Company Institute.

**Chart S19 Debit balances in New York Stock Exchange margin accounts**

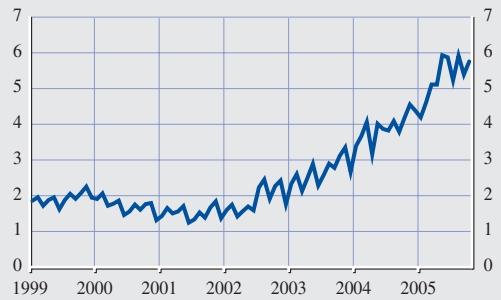
(Jan. 1992 - Sep. 2005, USD billions)



Source: New York Stock Exchange (NYSE).  
Note: Borrowing to buy stocks "on margin" allows investors to use loans to pay for up to 50% of a stock's price.

**Chart S20 Open interest in options contracts on the S&P 500 index**

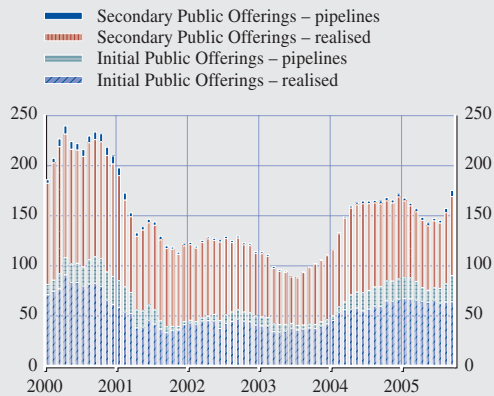
(Jan. 1999 - Oct. 2005, millions of contracts)



Source: Chicago Board Options Exchange (CBOE).

**Chart S21 Gross equity issuance in the US**

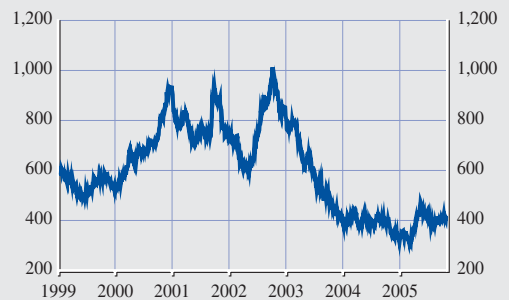
(Jan. 2000 - Sep. 2005, USD billions, 12-month moving sums)



Source: Thomson Financial Datastream.

**Chart S22 Spreads on US high-yield corporate bonds**

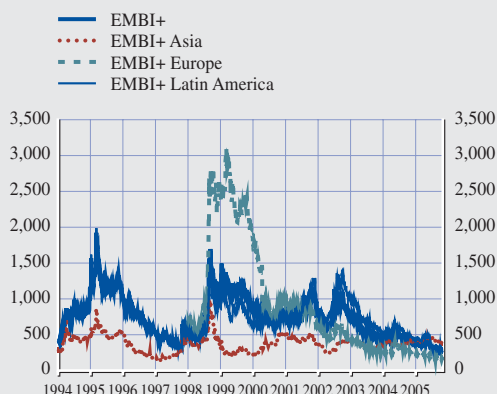
(Jan. 1999 - Nov. 2005, basis points)



Source: JP Morgan Chase & Co.  
Note: Spread between the yield to maturity of the US domestic high-yield index (BB+ rating or below, average maturity of 7.7 years) and US ten-year government bond yield.

**Chart S23 Sovereign bond spreads in major emerging regions**

(Jan. 1994 - Nov. 2005, basis points)



Source: JP Morgan Chase & Co.  
Note: The series shown is the Emerging Market Bond Index Plus (EMBI+) "performing" index.

**Chart S24 Equity market indices in major emerging regions**

(Jan. 2002 - Nov. 2005, index: Jan. 2002 = 100)



Source: Bloomberg.

**Table S2 Total international bond issuance (private and public) in selected emerging markets**

(USD millions)

	2001	2002	2003	2004 H1	2004 H2	2004 total	2005 Q1	2005 Q2	2005 Q3	2005 Jan.-Oct.
<b>Total major EMEs</b>	<b>66,078</b>	<b>65,220</b>	<b>98,982</b>	56,178	54,365	<b>110,543</b>	27,657	24,995	32,190	94,341
<b>Latin America</b>	<b>29,154</b>	<b>18,963</b>	<b>32,635</b>	19,825	16,877	<b>36,702</b>	9,087	6,444	12,573	29,245
<i>of which:</i>										
Argentina	3,328	-	-	915	-	915	150	-	-	150
Brazil	7,417	5,736	11,803	4,621	4,726	9,346	3,402	2,490	9,262	15,829
Chile	2,150	1,399	1,000	750	557	1,307	-	-	-	-
Colombia	4,004	1,000	1,265	500	1,044	1,544	447	-	1,000	1,447
Mexico	7,552	6,098	11,226	9,223	6,278	15,501	3,363	1,475	800	6,103
Venezuela	1,729	1,049	4,478	2,380	2,000	4,380	1,325	1,604	150	3,079
<b>Non-Japan Asia</b>	<b>31,677</b>	<b>35,629</b>	<b>49,942</b>	26,534	27,074	<b>53,608</b>	10,951	10,861	14,533	42,769
<i>of which:</i>										
China	2,552	860	2,979	352	5,837	6,188	500	195	1,500	3,272
Hong Kong	9,267	1,989	12,631	3,362	2,907	6,268	1,678	2,280	650	5,033
India	99	153	450	1,863	2,554	4,417	1,018	500	1,238	3,270
South Korea	6,545	11,843	11,193	8,507	7,496	16,003	3,725	2,717	3,023	10,589
Malaysia	1,766	5,965	1,442	1,325	2,115	3,440	1,053	1,095	1,100	4,248
Singapore	7,400	812	3,885	3,267	3,794	7,061	425	1,025	3,134	4,841
Thailand	-	48	300	1,000	400	1,400	150	650	650	1,550
<b>Emerging Europe</b>	<b>5,247</b>	<b>10,629</b>	<b>16,406</b>	9,818	10,414	<b>20,232</b>	7,620	7,690	5,083	22,327
<i>of which:</i>										
Russia	1,353	3,713	8,285	4,060	6,430	10,490	3,466	3,967	4,288	12,681
Turkey	2,159	3,560	5,454	3,843	2,634	6,477	3,794	2,875	795	7,464
Ukraine	-	399	1,250	808	1,350	2,158	100	234	-	1,308
Bulgaria	223	1,248	62	10	-	10	260	-	-	260
Romania	794	1,062	814	-	-	-	-	614	-	614
Croatia	718	647	541	1,098	-	1,098	-	-	-	-

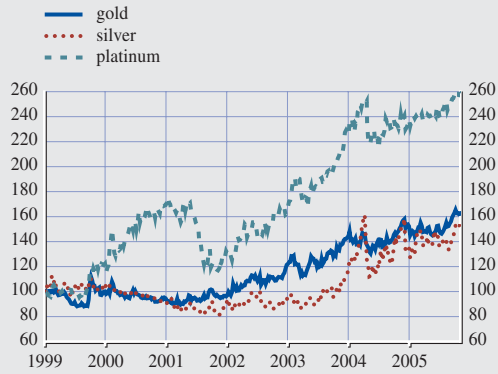
Source: Dealogic (Bondware).

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, the Philippines, Samoa, Singapore, South Korea, Taiwan, Thailand, Vietnam. Emerging Europe: Bulgaria, Croatia, Romania, Russia, Turkey and Ukraine.



### Chart S25 Precious metal prices

(Jan. 1999 - Nov. 2005, index: Jan. 1999 = 100, prices in USD)



Source: Bloomberg.

### Chart S26 Share of non-commercial futures positions in overall crude oil futures positions

(Jan. 2001 - Oct. 2005, %)

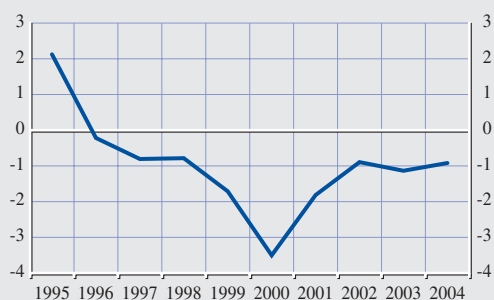


Source: Bloomberg.

### 3 EURO AREA ENVIRONMENT

**Chart S27 Net lending/borrowing of non-financial corporations**

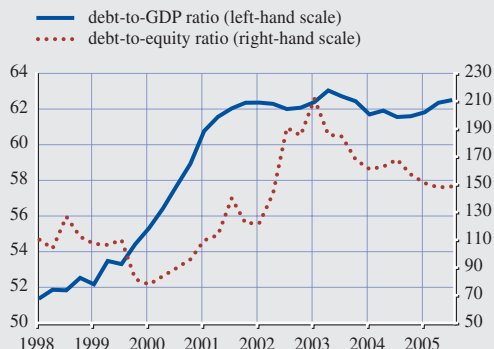
(1995 - 2004, financing gap, % of GDP)



Source: ECB.  
Note: Data for 2003 and 2004 are estimates using flow-of-funds projections.

**Chart S28 Total debt of non-financial corporations in the euro area**

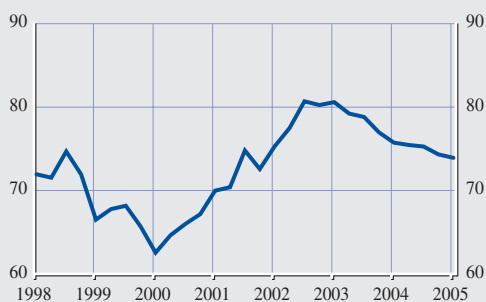
(Q1 1998 - Q3 2005, %)



Source: ECB.

**Chart S29 Total debt-to-financial asset ratio of non-financial corporations in the euro area**

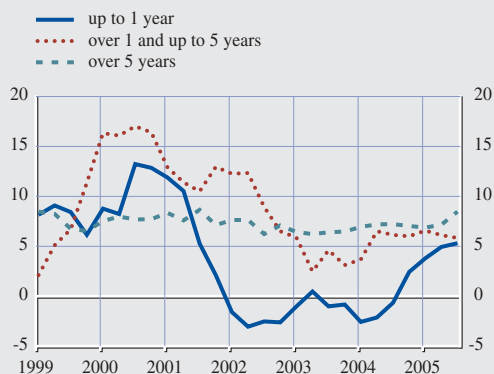
(Q1 1998 - Q1 2005, %)



Source: ECB.

**Chart S30 Annual growth of loans to non-financial corporations in the euro area for selected maturities**

(Q1 1999 - Q3 2005, % per annum)

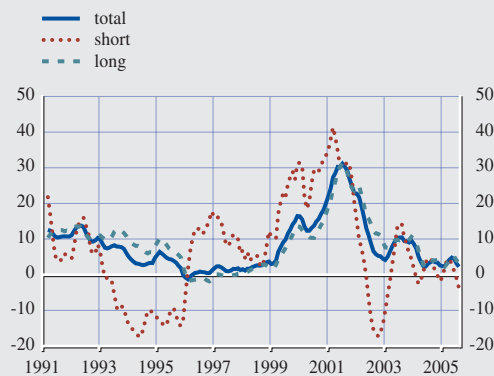


Source: ECB.  
Note: Data are based on financial transactions of MFIs' loans.



### Chart S31 Annual growth of debt securities issued by non-financial corporations in the euro area

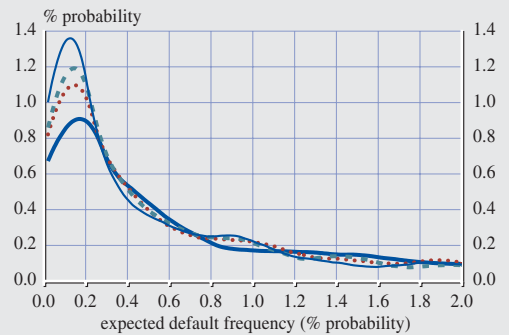
(Mar. 1991 - Aug. 2005, % per annum, three-month moving average)



Source: ECB.

### Chart S32 Euro area non-financial corporations' expected default frequency (EDF) distributions

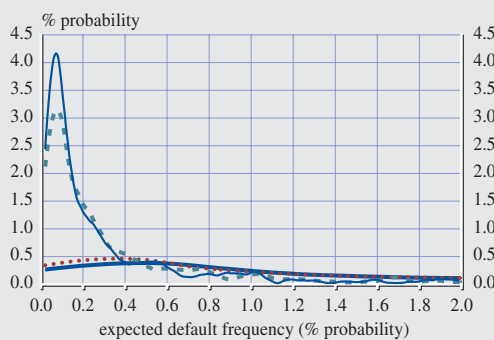
— December 2004  
 ..... March 2005  
 - - - June 2005  
 — September 2005



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

### Chart S33 Expected default frequency (EDF) distributions for large and small euro area non-financial corporations

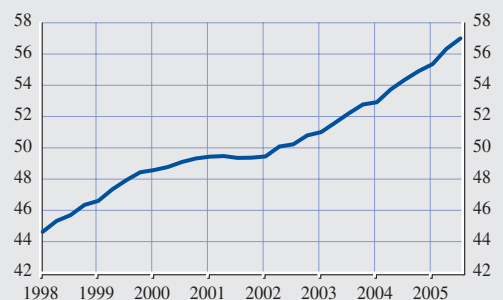
— small, March 2005  
 ..... small, September 2005  
 - - - large, March 2005  
 — large, September 2005



Sources: Moody's KMV and ECB calculations.  
 Note: The EDF 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 in the lower and large if in the upper quartile of the distribution.

### Chart S34 Household debt-to-GDP ratio in the euro area

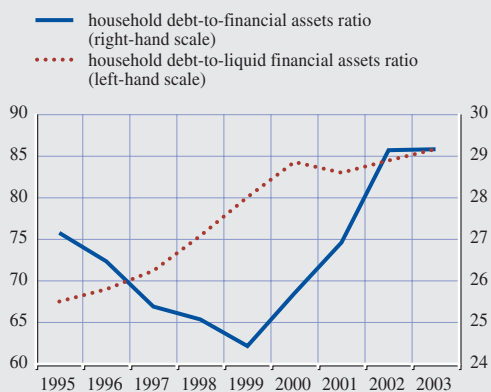
(Q1 1998 - Q3 2005, %)



Sources: ECB and Eurostat.  
 Note: Data for Q2 and Q3 2005 are estimated on the basis of monetary data.

**Chart S35 Ratio of household debt to financial assets and liquid financial assets in the euro area**

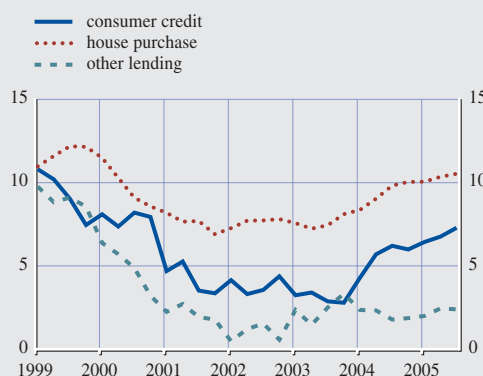
(1995 - 2003, %)



Source: ECB.

**Chart S36 Annual growth of loans to households in the euro area**

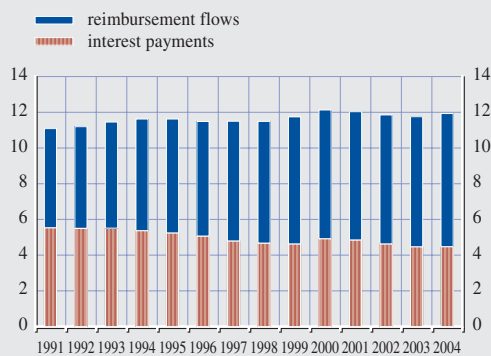
(Q1 1999 - Q3 2005, % per annum)



Source: ECB.  
Note: Data are based on financial transactions of MFIs' loans.

**Chart S37 Total debt servicing burden of the euro area household sector**

(1991 - 2004, % of disposable income)



Source: ECB calculations.  
Note: Data for 2004 are estimates.

## 4 EURO AREA FINANCIAL MARKETS

**Chart S38 Euro area spreads between interbank deposit and repo interest rates**

(Jan. 2000 - Oct. 2005, basis points, 20-day moving average)



Source: ECB.

**Chart S39 Bid-ask spreads for EONIA swap rates**

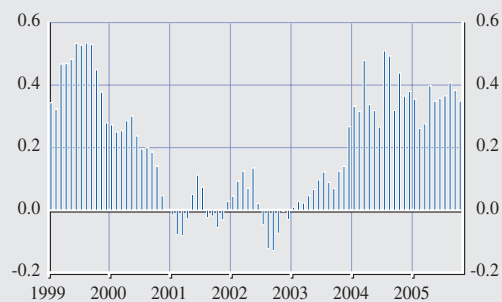
(Jan. 2003 - Oct. 2005, basis points, 20-day moving average, transaction weighted)



Source: ECB.

**Chart S40 Option-implied skewness coefficient for ten-year bond yields in Germany**

(Jan. 1999 - Oct. 2005, average monthly skewness)



Sources: Eurex and ECB calculations.

**Chart S41 Stock prices in the euro area**

(Jan. 2002 - Nov. 2005, Dow Jones EURO STOXX, index: Jan. 2003 = 100)



Source: Reuters.

**Chart S42 Price-earnings (P/E) ratio for the euro area stock market**

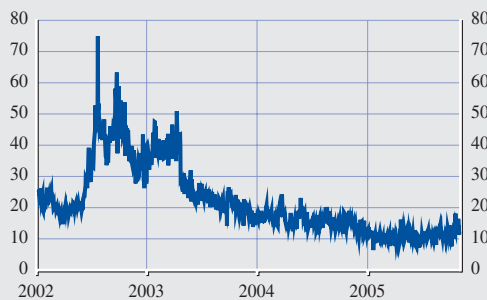
(Jan. 1983 - Nov. 2005, %, ten-year trailing earnings)



Source: Thomson Financial Datastream.  
Note: The P/E ratio is based on prevailing stock prices relative to an average of the previous ten years of earnings.

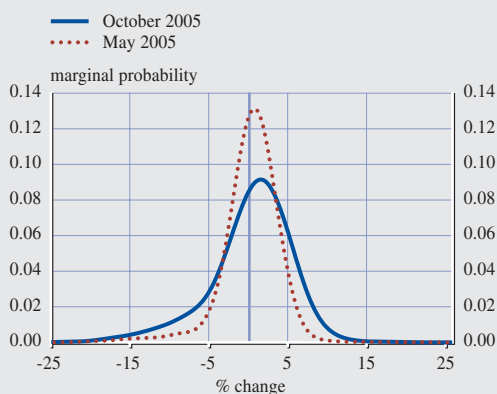
**Chart S43 Implied volatility for the Dow Jones EURO STOXX 50 index**

(Jan. 2002 - Nov. 2005, %)



Source: Bloomberg.

**Chart S44 Option-implied probability distribution function for the Dow Jones EURO STOXX 50 index**



Sources: Bloomberg and ECB calculations.

**Chart S45 Open interest in options contracts on the Dow Jones EURO STOXX 50 index**

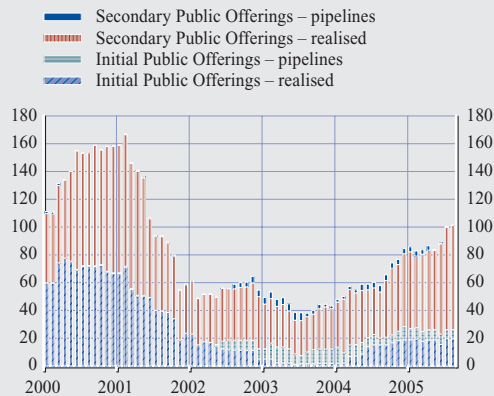
(Jan. 1999 - Oct. 2005, millions of contracts)



Source: Eurex.

### Chart S46 Gross equity issuance and pipeline deals in the euro area

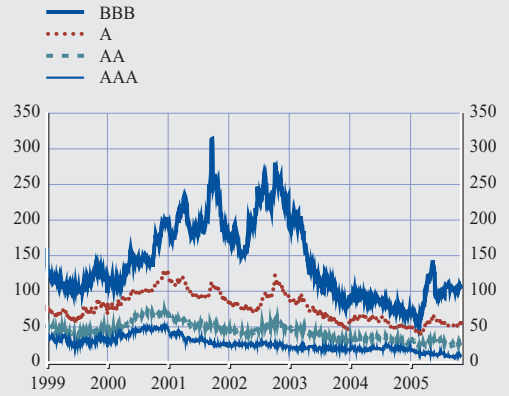
(Jan. 2000 - Aug. 2005, EUR billions, 12-month moving sums)



Source: Thomson Financial Datastream.

### Chart S47 Corporate bond spreads in the euro area

(Jan. 1999 - Nov. 2005, basis points)



Source: Thomson Financial Datastream.

Note: Spread between the seven to ten-year yield to maturity and the euro area seven to ten-year government bond yield.

### Chart S48 Spreads on euro area high-yield corporate bonds

(Jan. 1999 - Nov. 2005, basis points)



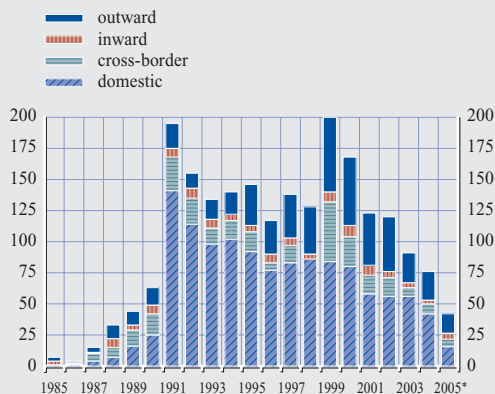
Source: JP Morgan Chase & Co.

Note: Spread between the yield to maturity of the euro area high-yield index (BB+ rating or below, average maturity of 5.5 years) and the euro area five-year government bond yield.

# 5 EURO AREA FINANCIAL INSTITUTIONS

**Chart S49 Number of euro area banking sector mergers and acquisitions (M&As)**

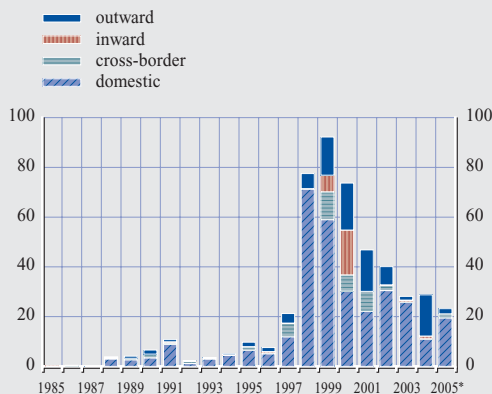
(1985 - 2005, number of deals)



Sources: Thomson Financial SDC and ECB calculations.  
 Note: M&As include both controlling and minority stakes and deals with and without reported value. "Cross-border" refers to inter-euro area M&As; "inward" denotes M&As by non-euro area banks in the euro area; and "outward" stands for M&A activity of euro area banks outside the euro area. (\*) Data until October 2005, annualised.

**Chart S50 Value of euro area banking sector mergers and acquisitions (M&As)**

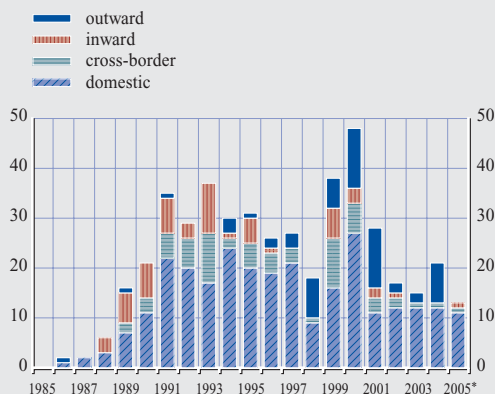
(1985 - 2005, value of deals, EUR billions)



Sources: Thomson Financial SDC and ECB calculations.  
 Note: M&As include both controlling and minority stakes. "Cross-border" refers to inter-euro area M&As; "inward" denotes M&As by non-euro area banks in the euro area; and "outward" stands for M&A activity of euro area banks outside the euro area. (\*) Data until October 2005, annualised.

**Chart S51 Number of mergers and acquisitions (M&As) between banks and insurance companies in the euro area**

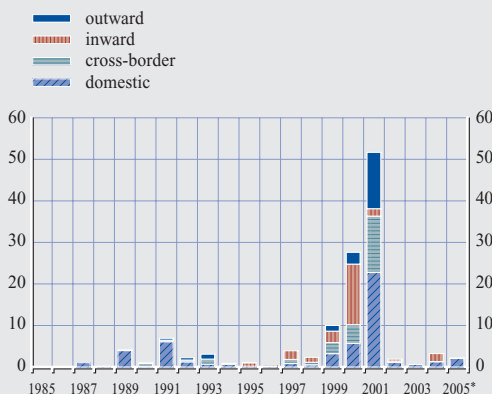
(1985 - 2005, number of deals)



Sources: Thomson Financial SDC and ECB calculations.  
 Note: The number of deals includes both deals with and without reported value, and records both minority and controlling stakes. (\*) Data until October 2005, annualised.

**Chart S52 Value of mergers and acquisitions (M&As) between banks and insurance companies in the euro area**

(1985 - 2005, value of deals, EUR billions)

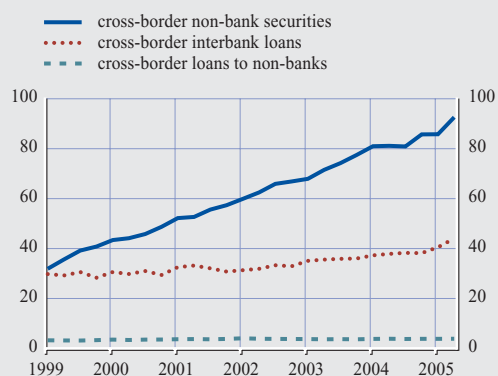


Sources: Thomson Financial SDC and ECB calculations.  
 Note: Deals include both controlling and minority stakes. (\*) Data until October 2005, annualised.



**Chart S53 Cross-border activity of euro area MFIs**

(Q1 1999 - Q2 2005, % of total domestic outstanding amounts)



Source: ECB.  
Note: Cross-border activity refers to cross-euro area activity (i.e. it excludes international activities in the non-euro area and third countries).

**Table S3 Euro area banking sector structure**

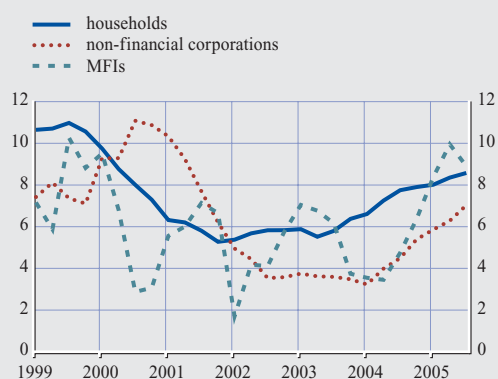
(2004)

		Change from 2003
<b>Number of credit institutions</b>		
Stand-alone credit institutions	4,102	-219
Banking groups	458	-35
Credit institutions	4,551	-259
Domestic credit institutions	3,681	-234
Foreign-controlled subsidiaries and branches	870	-25
<b>Total assets (EUR billions)</b>		
Domestic credit institutions	18,963	5.9
of which (%):		
Large	69.4	2.5
Medium-sized	26.5	-2.0
Small	4.2	-0.6
Foreign-controlled subsidiaries and branches	2,936	8.7

Source: Banking Supervision Committee.  
Note: Changes from 2003: for the number of institutions, they are in absolute numbers; for total assets, in percentages; for the size distribution breakdown of total assets, in percentage points.

**Chart S54 Annual growth in euro area MFI loans extended by sector**

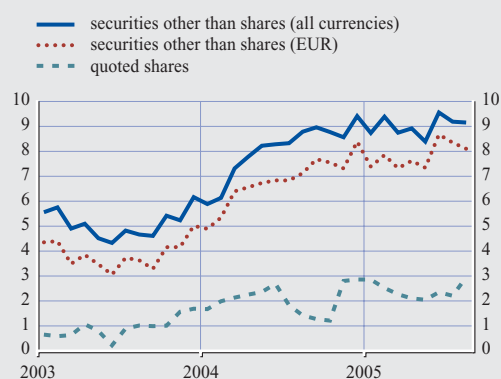
(Q1 1999 - Q3 2005, % per annum)



Source: ECB.  
Note: Data are based on financial transactions of MFIs' loans.

**Chart S55 Annual growth in euro area MFIs' securities and shares issuance**

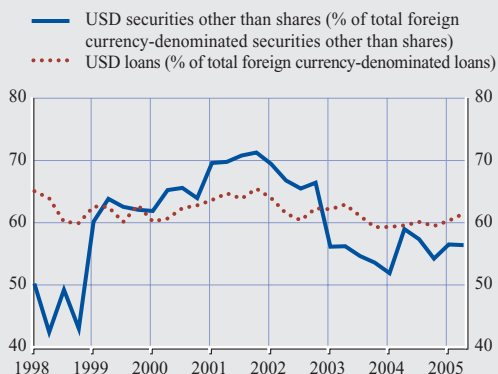
(Jan. 2003 - Aug. 2005, % per annum)



Source: ECB.

**Chart S56 Euro area MFIs' foreign currency-denominated assets, selected balance sheet items**

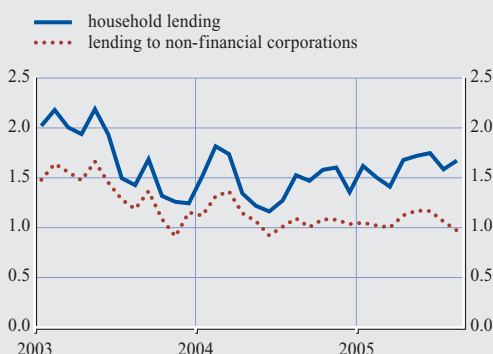
(Q1 1998 - Q2 2005)



Source: ECB.

**Chart S57 Lending margins of euro area MFIs**

(Jan. 2003 - Aug. 2005, % 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 S58 Deposit margin of euro area MFIs**

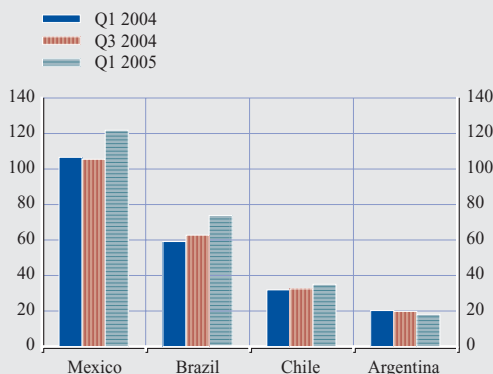
(Jan. 2003 - Aug. 2005, % points)



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 S59 International exposure of euro area banks to Latin American countries**

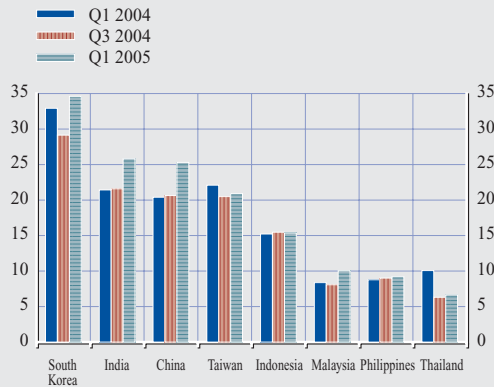
(USD billions)



Source: BIS.

**Chart S60 International exposure of euro area banks to Asian countries**

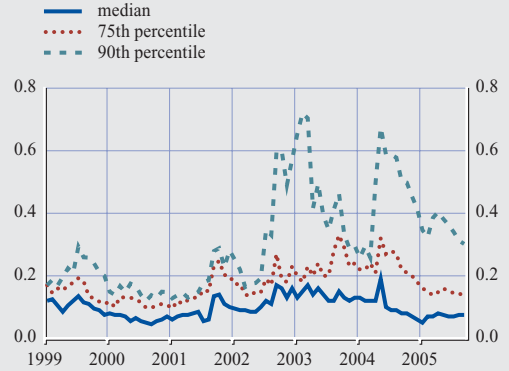
(USD billions)



Source: BIS.

**Chart S61 Expected default frequencies (EDF) for large euro area banks**

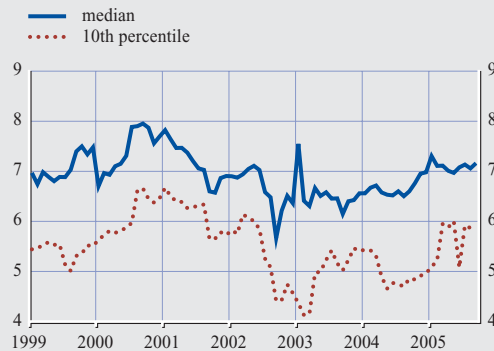
(Jan. 1999 - Sep. 2005, % probability)



Sources: Moody's KMV and ECB calculations.

**Chart S62 Distance-to-default for large euro area banks**

(Jan. 1999 - Sep. 2005)



Sources: Moody's KMV and ECB calculations.  
Note: An increase in the distance-to-default reflects an improving assessment.

**Chart S63 European financial institutions' credit default swaps on senior and subordinated debt**

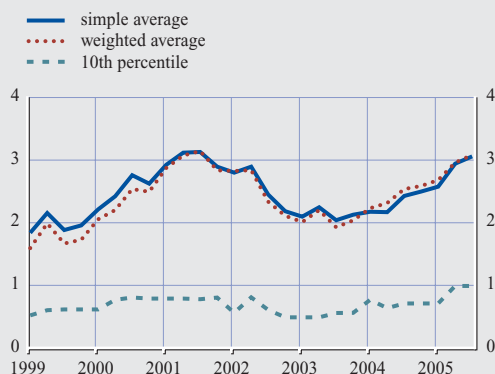
(May 2002 - Nov. 2005, basis points, five-year maturity)



Source: JP Morgan Chase & Co.  
Note: "European financial institutions" corresponds to the definition of JP Morgan Chase & Co.

**Chart S64 Large euro area banks' earnings per share (EPS)**

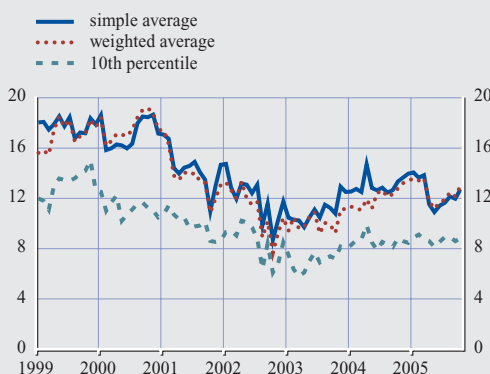
(Q1 1999 - Q3 2005, %)



Sources: Thomson Financial Datastream and ECB calculations.

**Chart S65 Price-earnings (P/E) ratios for large euro area banks**

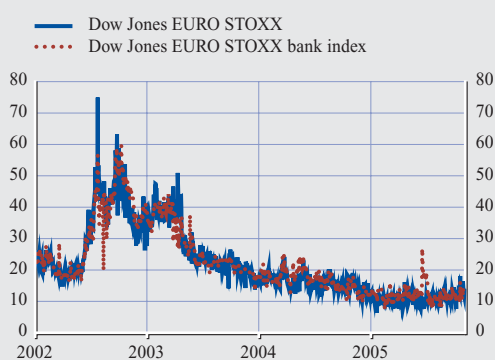
(Jan. 1999 - Oct. 2005, %)



Sources: Thomson Financial Datastream and ECB calculations.

**Chart S66 Implied volatility for Dow Jones EURO STOXX total market and bank indices**

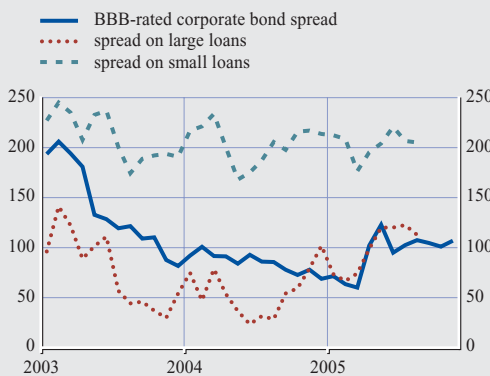
(Jan. 2002 - Nov. 2005, %)



Source: Bloomberg.

**Chart S67 Euro area corporate bond and bank loan spreads**

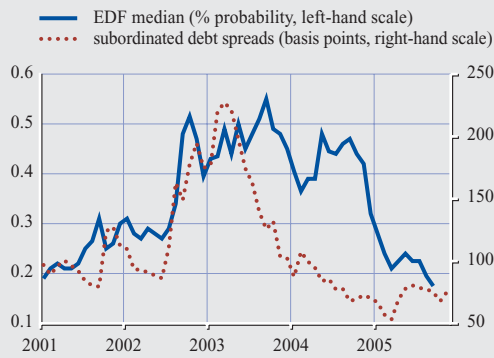
(Jan. 2003 - Nov. 2005, basis points)



Sources: ECB and Thomson Financial Datastream.  
Note: Spread between the rate on loans to non-financial corporations with one up to five years' initial rate fixation below (small) and above (large) 1 EUR million, and the three-year government bond yield.

**Chart S68 Subordinated bond spreads and expected default frequencies (EDF) for the euro area insurance industry**

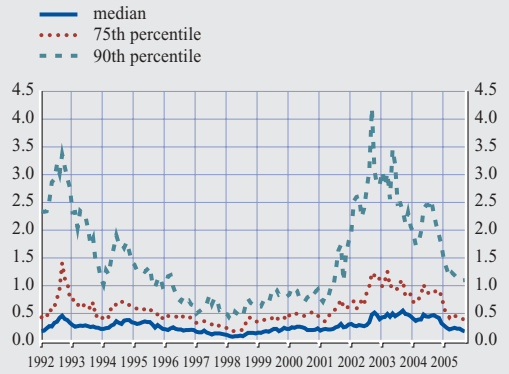
(Jan. 2003 - Nov. 2005)



Sources: Moody's KMV and JP Morgan Chase & Co.

**Chart S69 Expected default frequencies (EDF) for the euro area insurance industry**

(Jan. 1992 - Sep. 2005, % probability)



Source: Moody's KMV.

**Table S4 Euro area consolidated foreign claims of reporting banks on individual countries**

(USD billions)

	Q1 2003	Q2 2003	Q3 2003	Q4 2003	Q1 2004	Q2 2004	Q3 2004	Q4 2004	Q1 2005
<b>Total all countries</b>	<b>3847.3</b>	<b>4164.7</b>	<b>4146.5</b>	<b>4345.3</b>	<b>4824.6</b>	<b>4815.5</b>	<b>4900.4</b>	<b>5588.5</b>	<b>5774.3</b>
<b>Total non-developed countries (incl. offshore centres)</b>	<b>962.5</b>	<b>993.7</b>	<b>1045.3</b>	<b>1129.7</b>	<b>1185.6</b>	<b>1208.7</b>	<b>1238.5</b>	<b>1408.4</b>	<b>1414.1</b>
Hong Kong	26.3	30.3	30.0	31.9	35.3	36.3	36.7	41.1	35.9
Singapore	31.4	31.0	31.6	29.1	34.8	34.1	34.2	36.2	35.8
<b>Total offshore centres</b>	<b>269.4</b>	<b>272.8</b>	<b>290.6</b>	<b>302.4</b>	<b>331.6</b>	<b>343.6</b>	<b>364.7</b>	<b>416.9</b>	<b>423.5</b>
China	18.5	19.0	20.2	19.0	20.4	22.5	20.6	23.8	25.3
India	14.7	15.9	17.6	18.4	21.4	21.1	21.6	24.2	25.8
Indonesia	14.7	15.8	15.0	15.2	15.2	14.4	15.5	15.8	15.4
Malaysia	7.4	8.2	8.7	8.7	8.4	7.9	8.1	9.9	10.1
Philippines	6.6	6.9	7.5	7.5	8.8	8.7	9.0	8.4	9.2
South Korea	23.6	27.0	30.0	29.9	32.9	31.4	29.2	33.3	34.6
Taiwan China	11.7	13.6	17.2	17.9	22.1	23.7	20.5	23.6	20.9
Thailand	9.6	9.5	10.4	9.9	10.1	9.3	6.3	6.3	6.7
<b>Total Asia and Pacific EMEs</b>	<b>121.6</b>	<b>130.9</b>	<b>142.9</b>	<b>145.1</b>	<b>160.3</b>	<b>162.0</b>	<b>151.5</b>	<b>168.6</b>	<b>172.1</b>
Cyprus	21.4	24.2	25.9	31.5	30.4	33.7	33.7	37.8	17.6
Czech Republic	24.3	25.7	26.3	39.0	40.4	41.1	39.1	46.0	45.5
Hungary	27.1	29.3	31.9	36.0	37.2	39.5	41.4	49.8	50.4
Poland	56.4	57.3	59.0	64.1	62.9	65.2	69.4	87.2	88.5
Russia	24.3	25.8	28.0	33.3	37.1	34.2	34.2	40.7	40.0
Turkey	20.6	20.5	20.8	22.5	22.7	23.3	23.7	26.1	26.9
<b>Total European EMEs and new EU Member States</b>	<b>244.2</b>	<b>256.0</b>	<b>270.6</b>	<b>322.8</b>	<b>330.1</b>	<b>342.0</b>	<b>354.4</b>	<b>419.5</b>	<b>408.2</b>
Argentina	23.5	23.1	22.9	21.6	20.3	19.8	19.8	19.8	18.1
Brazil	51.2	54.4	57.1	59.4	59.1	58.4	62.7	67.2	73.8
Chile	29.3	29.2	29.9	32.6	31.9	31.0	32.5	35.0	35.1
Colombia	6.8	6.7	6.7	6.4	6.8	6.7	6.9	8.1	7.4
Ecuador	0.6	0.6	0.7	0.7	0.8	0.8	0.9	0.9	0.9
Mexico	98.2	100.7	100.7	103.9	106.6	107.2	105.5	120.0	121.8
Peru	8.7	9.8	9.2	9.5	9.3	9.5	9.6	10.0	9.9
Uruguay	2.2	2.0	2.1	2.0	1.9	2.0	2.0	2.0	2.3
Venezuela	10.5	10.8	11.7	13.1	12.1	12.5	12.8	14.7	14.3
<b>Total Latin America</b>	<b>239.9</b>	<b>245.9</b>	<b>249.8</b>	<b>258.4</b>	<b>258.0</b>	<b>256.5</b>	<b>261.3</b>	<b>288.0</b>	<b>294.2</b>
Iran	6.4	7.4	7.8	8.7	9.5	9.5	10.1	11.7	12.2
Morocco	10.4	9.2	9.7	11.3	10.5	11.0	11.4	12.6	12.6
South Africa	9.2	10.6	10.7	11.3	11.3	11.2	11.6	13.5	12.5
<b>Total Middle East and Africa</b>	<b>87.4</b>	<b>88.1</b>	<b>91.4</b>	<b>101.0</b>	<b>105.6</b>	<b>104.5</b>	<b>106.6</b>	<b>115.4</b>	<b>116.0</b>

Source: BIS.

**Table S5 Euro area banks' profitability and efficiency**

(2004)

	All domestic banks	Change from 2003	Large domestic banks	Change from 2003	Medium domestic banks	Change from 2003	Small domestic banks	Change from 2003	Foreign banks	Change from 2003
<b>Income</b>										
<b>(% of total assets)</b>										
Net interest income	1.21	-0.05	0.95	-0.06	1.70	0.02	2.42	0.00	0.88	-0.15
Interest receivable	3.71	-0.24	3.47	-0.21	4.22	-0.22	4.41	-0.24	3.95	-0.62
Interest payable	2.50	-0.18	2.52	-0.15	2.53	-0.25	1.99	-0.23	3.06	-0.46
Net non-interest income	1.08	-0.03	1.16	-0.06	0.86	0.03	1.26	-0.01	0.97	-0.02
Fees and commissions (net)	0.61	0.02	0.61	0.01	0.57	0.03	0.88	0.08	0.58	0.00
Trading and forex results	0.19	-0.01	0.25	-0.02	0.05	0.00	0.04	-0.01	0.16	-0.01
Other operating income (net)	0.29	-0.03	0.30	-0.05	0.23	0.01	0.33	-0.07	0.23	-0.01
Total income	2.29	-0.08	2.11	-0.12	2.55	0.05	3.68	-0.01	1.85	-0.17
<b>Expenditure structure</b>										
<b>(% of total assets)</b>										
Staff costs	0.85	-0.03	0.80	-0.05	0.88	0.01	1.47	0.02	0.59	-0.09
Administrative costs	0.50	-0.03	0.48	-0.03	0.48	-0.01	0.90	-0.01	0.44	-0.05
Other	0.11	-0.01	0.10	-0.01	0.13	0.00	0.21	-0.02	0.10	0.00
Total expenses	1.46	-0.07	1.38	-0.09	1.49	-0.01	2.58	-0.01	1.13	-0.14
<b>Profitability</b>										
<b>(% of total assets)</b>										
Operating profits	0.83	-0.01	0.73	-0.03	1.06	0.06	1.09	-0.01	0.72	-0.03
Specific provisions	0.26	-0.11	0.18	-0.13	0.45	-0.03	0.37	-0.10	0.15	-0.05
Funds for general banking risks	0.00	0.00	0.00	-0.01	0.02	0.01	0.02	0.00	-0.01	-0.03
Extraordinary items (net)	0.00	0.00	-0.02	0.01	0.07	0.01	0.03	-0.05	0.04	-0.01
Tax charges	0.17	0.01	0.15	0.02	0.21	0.01	0.24	-0.02	0.13	0.01
Profits (before tax and extraord. items)	0.59	0.12	0.57	0.13	0.62	0.09	0.71	0.10	0.58	0.04
Profits (after tax and extraord. items) (ROA)	0.42	0.11	0.39	0.12	0.49	0.09	0.49	0.06	0.49	0.02
<b>Return on equity</b>										
Profits (after tax and extraord. items) (% Tier 1) (ROE)	10.54	2.78	11.68	3.79	9.50	1.45	6.52	0.90	10.46	0.14
<b>Income structure</b>										
<b>(% of total income)</b>										
Net interest income	52.77	-0.47	45.07	-0.13	66.50	-0.54	65.76	0.15	47.92	-3.22
Net non-interest income	47.23	0.47	54.93	0.13	33.50	0.54	34.24	-0.15	52.08	3.22
Fees and commissions (net)	26.50	1.71	28.73	2.07	22.21	0.65	24.03	2.14	31.32	2.83
Trading and forex results	8.25	-0.22	11.83	-0.41	2.12	-0.20	1.13	-0.36	8.40	-0.05
Other operating income (net)	12.49	-1.02	14.37	-1.53	9.17	0.09	9.09	-1.93	12.35	0.45
<b>Expenditure structure</b>										
<b>(% of total costs)</b>										
Staff costs	57.98	0.69	57.76	0.55	58.77	0.97	56.96	0.86	52.58	-1.48
Administrative costs	34.26	-0.20	34.99	0.00	32.32	-0.73	34.83	-0.27	38.97	0.64
Other	7.77	-0.48	7.25	-0.55	8.91	-0.24	8.21	-0.58	8.45	0.84
<b>Efficiency</b>										
Cost-to-income ratio (% of total income)	63.67	-0.88	65.34	-0.70	58.52	-1.52	70.31	0.13	61.08	-1.76
Asset share of banks with a cost-to-income ratio of over 80%	5.18	-3.29	5.91	-3.51	2.26	-3.25	11.51	-1.26	9.04	2.27

Source: Banking Supervision Committee.

Note: Changes from 2003 are in percentage points.

**Table S6 Euro area banks' balance sheet and off-balance sheet items**

(2004)

	All domestic banks	Change from 2003	Large domestic banks	Change from 2003	Medium domestic banks	Change from 2003	Small domestic banks	Change from 2003	Foreign banks	Change from 2003
<b>Assets</b>										
<b>(% of total assets)</b>										
Cash and balances	1.31	-0.08	1.24	0.00	1.41	-0.23	1.90	-0.11	0.88	-0.12
Short-term government debt	1.78	0.53	1.48	0.44	2.17	0.83	3.13	0.17	1.39	0.48
Loans to credit institutions	16.52	-0.69	17.70	-0.74	14.03	-1.05	12.64	-0.13	28.17	-1.95
Debt securities	20.50	-0.06	23.56	0.16	13.58	-1.47	13.54	-0.01	21.31	2.68
Debt securities (public bodies)	7.37	2.85	9.43	3.82	4.57	1.36	2.09	1.49	5.79	0.41
Debt securities (other borrowers)	7.62	-8.57	9.94	-7.95	4.30	-9.02	3.34	-11.57	12.29	1.74
Loans to customers	48.39	-0.01	43.92	-0.16	58.68	1.56	57.25	0.35	37.90	-1.69
Shares and participating interest	3.41	-0.02	3.04	0.04	4.09	-0.11	5.38	0.46	2.78	-0.11
Tangible and intangible assets	1.34	-0.03	1.24	-0.06	1.51	0.07	1.84	-0.02	0.88	-0.06
Other assets	7.11	0.59	8.30	0.47	4.70	0.61	2.50	0.00	7.02	1.26
<b>Liquidity</b>										
Liquid asset ratio 1 (cash and short-term government debt)	2.60	0.28	2.24	0.29	3.20	0.41	4.85	0.06	1.87	0.21
Liquid asset ratio 2 (ratio 1 + loans to cred. inst.)	19.12	-0.41	19.94	-0.45	17.22	-0.63	17.48	-0.06	30.05	-1.74
Liquid asset ratio 3 (ratio 2 + debt sec. by public bodies)	22.13	-0.53	23.24	-0.67	19.84	-0.64	18.20	0.17	34.08	-1.40
<b>Liabilities</b>										
<b>(% of total assets)</b>										
Amounts owed to credit institutions	22.18	-0.79	24.50	-0.72	17.53	-1.52	13.09	-1.57	38.52	0.13
Amounts owed to customers	40.59	-0.06	36.92	0.03	46.22	0.66	65.75	1.71	30.15	-1.42
Debt certificates	21.36	0.42	21.99	0.57	22.04	-0.27	6.49	0.55	15.54	0.92
Accruals and other liabilities	7.91	0.31	9.39	0.31	4.67	-0.03	3.87	-0.37	8.53	1.26
Funds for general banking risks	0.17	-0.01	0.16	-0.03	0.21	0.04	0.19	0.02	0.19	-0.03
Provisions for liabilities and charges	1.34	0.02	1.19	-0.09	1.77	0.33	1.08	0.01	0.70	-0.09
Subordinated liabilities	1.91	0.06	1.95	-0.07	2.01	0.35	0.63	-0.11	1.51	-0.19
Equity	3.68	0.00	3.07	-0.07	4.68	0.32	7.44	0.15	4.30	-0.49
Other liabilities	0.44	0.03	0.44	0.00	0.49	0.09	0.11	0.02	0.18	-0.01
Profit or loss for the financial year	0.41	0.03	0.31	0.06	0.51	0.08	1.56	-0.41	0.46	-0.04
<b>Selected off-balance sheet items (% of total assets)</b>										
Credit lines	12.67	0.83	14.72	0.91	8.66	0.34	4.06	-1.22	12.14	-0.38
Guarantees and other commitments	5.91	-0.11	5.26	-0.38	7.73	0.62	5.02	0.32	7.14	0.28
Derivatives	2.47	-6.43	3.33	-12.33	1.75	-0.15	0.32	0.09	8.45	-5.48

Source: Banking Supervision Committee.

Note: Changes from 2003 are in percentage points. Concerning the item "debt securities", some countries only provided information on the total amount and not on the split between the two sub-items, i.e. "issued by public bodies" and "issued by other borrowers". Consequently, the sum of the two sub-items can be smaller than the total amount.



**Table S7 Euro area banks' non-performing loans and provisioning**

(2004)

	All domestic banks	Change from 2003	Large domestic banks	Change from 2003	Medium domestic banks	Change from 2003	Small domestic banks	Change from 2003	Foreign banks	Change from 2003
<b>Asset quality (% of loans and advances)</b>										
Non-performing and doubtful assets (gross)	3.05	-0.36	2.56	-0.29	3.55	-0.47	7.00	0.12	1.24	-0.19
<b>Asset quality (% of own funds)</b>										
Non-performing and doubtful assets (gross)	49.23	-6.49	46.86	-5.00	49.65	-10.56	65.41	-1.22	16.37	1.09
Non-performing and doubtful assets (net)	13.34	-4.60	8.65	-3.03	17.54	-8.19	31.22	-2.53	-0.37	1.06
<b>Provisioning (stock) (% of loans and advances)</b>										
Total provisions	2.19	-0.09	2.09	-0.12	2.20	-0.03	3.64	0.07	1.25	-0.17
<b>Provisioning (stock) (% of non-performing and doubtful assets)</b>										
Total provisions	72.90	5.09	81.55	4.05	64.68	7.01	52.28	0.23	103.49	4.47

Source: Banking Supervision Committee.

Note: Changes from 2003 are in percentage points. Definitions of non-performing and doubtful assets differ between countries. Consequently, these data should be interpreted with caution.

**Table S8 Euro area banks' regulatory capital ratios and risk-adjusted items**

(2004)

	All domestic banks	Change from 2003	Large domestic banks	Change from 2003	Medium domestic banks	Change from 2003	Small domestic banks	Change from 2003	Foreign banks	Change from 2003
Overall solvency ratio	11.49	-0.12	10.92	-0.30	12.11	0.17	14.33	0.27	14.77	-0.70
Tier 1 ratio	8.41	0.05	7.92	-0.01	8.73	0.16	12.19	0.15	12.47	-0.53
<b>Risk-adjusted items</b>										
<b>(% of total risk-adjusted assets)</b>										
Risk-weighted assets	81.70	-0.28	78.15	-0.25	86.66	-0.48	92.56	0.07	79.11	-0.82
Risk-weighted off-balance sheet items	12.23	0.41	13.86	0.50	10.14	0.35	6.07	-0.03	12.40	-1.27
Risk-adjusted trading book	6.07	-0.14	7.99	-0.25	3.20	0.13	1.37	-0.03	8.48	2.09

	All banks	Change from 2003
Overall solvency ratio	11.76	-0.15
Tier 1 ratio	8.75	0.02
<b>Distribution of overall solvency ratio</b>		
Overall solvency ratio < 7%	0.03	0.01
Overall solvency ratio 7%-8%	0.03	0.02
Overall solvency ratio 8%-9%	2.49	-1.35
Overall solvency ratio 9%-10%	14.80	7.10
Overall solvency ratio 10%-11%	21.74	-0.90
Overall solvency ratio 11%-13%	43.31	-2.24
Overall solvency ratio > 13%	17.60	-2.65
<b>Overall solvency ratio below 9%</b>		
Number of banks	67	-27
Asset share (% of total banking sector assets)	0.76	0.30
<b>Risk-adjusted items</b>		
<b>(% of total risk-adjusted assets)</b>		
Risk-weighted assets	81.49	-0.33
Risk-weighted off-balance-sheet items	12.24	0.28
Risk-adjusted trading book	6.27	0.05
<b>Composition of trading book</b>		
<b>own funds requirement (% of total trading book own funds requirement under CAD)</b>		
Own funds requirement for traded debt instruments	49.07	0.49
Own funds requirement for equities	9.96	0.27
Own funds requirement for foreign exchange risk	7.78	-0.02
Own funds requirement for other trading book items	33.19	-0.74

Source: Banking Supervision Committee.

Note: Changes from 2003 are in percentage points.

**Table S9 Financial conditions of a set of large euro area banks**

(2004 - H1 2005)

		IFRS reporting banks					non-IFRS reporting banks				
		min.	1st quartile	avg.	3rd quartile	max.	min.	1st quartile	avg.	3rd quartile	max.
<b>Return on equity</b>	<b>2004</b>	7.40	12.45	13.58	19.35	31.80	-23.50	-2.15	4.50	8.25	10.80
	<b>H1 2005</b>	9.60	16.54	20.81	25.28	35.60	14.20	14.50	15.30	15.10	15.40
<b>Net interest income</b> (% of total assets)	<b>2004</b>	0.70	1.19	1.55	1.93	2.75	0.32	0.51	0.61	0.86	1.13
	<b>H1 2005</b>	0.41	0.85	0.93	1.40	1.98	0.28	0.40	0.55	0.58	0.63
<b>Provisions</b> (% of total assets)	<b>2004</b>	0.05	0.14	0.16	0.36	0.76	0.04	0.09	0.09	0.15	0.24
	<b>H1 2005</b>	0.01	0.02	0.08	0.17	0.38	0.04	0.06	0.08	0.14	0.20
<b>Tier 1 ratio</b>	<b>2004</b>	6.60	7.50	7.53	8.46	11.40	6.50	7.55	8.06	8.33	8.70
	<b>H1 2005</b>	6.40	7.46	8.24	9.55	11.10	6.70	7.25	8.28	8.45	9.10
<b>Overall solvency ratio</b>	<b>2004</b>	10.10	10.81	11.36	12.40	13.01	10.50	10.73	11.55	12.08	12.30
	<b>H1 2005</b>	10.00	10.59	11.92	12.54	18.40	10.80	11.25	12.57	12.65	13.60
<b>Cost-to-income ratio</b>	<b>2004</b>	45.10	59.43	63.52	70.53	81.10	59.20	65.60	75.05	75.70	79.40
	<b>H1 2005</b>	43.40	53.65	61.44	66.15	82.20	68.20	69.40	71.93	71.80	73.00

Sources: Banks' annual accounts and interim results and ECB calculations.

**Table S10 Euro area banks' exposures at risk to seven aggregate sectors**

		BaC	EnU	Cap	CCy	CNC	Fin	TMT
<b>9 euro area countries</b>								
Total exposure, March 2005	EUR billions	608.9	223.9	223.9	1,682.5	805.3	6,360.5	218.2
Sectoral EDF, June 2004	% probability	0.63	0.97	0.90	0.58	0.23	0.13	2.42
Sectoral EDF, March 2005	% probability	0.25	0.08	0.5	0.46	0.23	0.07	1.13
Exposure at risk, March 2005	EUR billions	1.5	0.2	1.1	7.7	1.9	4.5	2.5
Change in exposure at risk, March 2005 - June 2004 <sup>1)</sup>	%	-66.9	-87.6	-50.3	-14.5	32.1	46.3	-14.5
Change in EDF, March 2005 - June 2004	%	-60.3	-91.8	-44.4	-20.0	2.2	-46.2	-53.2

Sources: Banking Supervision Committee and Moody's.

Note: The sectors are as follows: basic materials and construction (BaC), capital goods (Cap), consumer cyclicals (CCy), non-cyclicals (CNC), energy and utilities (EnU), financial (Fin), and technology and telecommunications (TMT).

1) Changes are based on seven euro area countries to ensure comparability with 2004 data. The countries included in the 2005 data are AT, BE, DE, ES, FI, IE, PT, IT and FR.

