EUROPEAN CENTRAL BANK

FINANCIAL STABILITY REVIEW

JUNE 2005

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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 accurately, and that risks are efficiently managed. By laying foundations for future vulnerabilities, inefficiencies in the reallocation 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 co-operation among the national central banks and supervisory authorities of the EU and the ECB.

I OVERVIEW OF RISKS TO FINANCIAL STABILITY

While still likely to be positive, the outlook for euro area financial system stability rests upon a delicate balance. On the one hand, there has been a broad-based improvement in the capacity of the financial system to absorb adverse disturbances. On the other, financial imbalances are already quite large and could expand further, primarily at the global, but also at the domestic, level. The tension between these two factors suggests that the likely outcomes are, at this stage, bi-modal, with a positive outcome being the most likely prospect.

In 2004, financial institutions and markets benefited from the fastest pace of global economic growth since 1980, which helped to enhance shock absorption capacities. In this environment, indicators of credit risk generally remained very favourable; the strength of activity in fixed income markets continued to be buoyant; and financial market volatility stayed very low across most asset classes. As a result, the profitability of banks improved and the balance sheets of insurance companies were strengthened. In addition, key financial infrastructures – including payments systems, such as TARGET, and securities settlement systems – remained robust and continued to facilitate a smooth allocation of financial resources.

Within the financial system, pockets of fragility may still exist in the banking sectors of some euro area countries where profitability has remained frail, as well as in the life insurance sector. However, the main source of vulnerability appears to be associated with concerns that an underestimation of risk may have pushed asset prices beyond their intrinsic value, especially in fixed income markets. While the conditions in global financial markets have remained benign, if history is any guide, a reappraisal of risk – involving adverse market dynamics in the euro area as well – cannot be excluded in the coming period.

Outside the euro area financial system, large and growing global financial imbalances continue to pose medium-term risks for the stability of foreign exchange and other financial markets. The surge in oil prices over the past six months, should it prove to be as lasting as futures prices suggest, could test the robustness of smaller firms' finances, where the process of balance sheet repair appears to have lagged behind that of larger firms. Concerns also remain about the credit and wealth risk implications of expanding household balance sheets in some euro area countries.

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

RISKS FROM GLOBAL FINANCIAL IMBALANCES

The US current account deficit continued to swell in 2004, despite a further effective depreciation of the dollar and a measured rise in US monetary policy interest rates. Reaching new post-Bretton Woods records, the US external imbalance absorbed the bulk of savings that the rest of the world did not invest at home and, as US external indebtedness scaled new heights, it fuelled ongoing debate about medium-term sustainability. This ultimately hinges upon the ability and willingness of external investors to continue financing the US deficit. So far, there has been little indication of any financing challenges: despite very low real interest rates, capital inflows to the US have remained well sustained.

Globally, the main counterparts of the US current account deficit in 2004 were surpluses in Asia, especially China and Japan, as well as in some Middle Eastern countries. The

exchange rate policies of several Asian economies have continued to support export-oriented growth strategies by stabilising exchange rates, and ample savings in the region have remained a significant source of finance for the US current deficit. They also appear to have played an important role in holding long-term interest rates down as foreign exchange reserves accumulated by these countries have continued to be recycled into the US bond markets. This appears to have underpinned the further widening of US imbalances, thereby delaying any adjustment.

Looking ahead, given the relatively high US propensity to import out of income, coupled with consensus expectations that US economic growth will exceed that of the rest of the world in the coming year, global imbalances could yet expand further. Within the US, the main sources of savings-investment imbalances have been growing fiscal imbalances and heavy household borrowing. The fiscal deficit may not contract significantly in the period ahead and corporate sector financing surpluses could soon turn negative, especially because the process of corporate sector balance sheet strengthening has shown signs of maturing.

Concerns about the medium-term sustainability of large and growing global imbalances appear to be closely connected with the willingness or need of Asian central banks to further augment their US dollar foreign exchange reserves. From a financial stability viewpoint, such concerns could increase the likelihood of a disorderly rebalancing, involving a capital account adjustment and/or the possibility of severe downward pressure on the US dollar, coupled with significant upward pressure on long-term interest rates. While there has been a slight upturn in US long-term bond yields and some further US dollar depreciation over the past six months, volatility has remained low in both of these markets and adjustments have been orderly. Nevertheless, if the recent further widening of global imbalances is not corrected over the medium term, important risks will remain.

RISKS IN CAPITAL MARKETS

Compared to earlier cycles, the widely expected and measured increases in the US Federal Funds rate from June 2004 onwards had a relatively limited impact on pricing in the fixed income markets. The tightening of monetary policy seemed to prompt an unwinding of "carry trades" – where funds are borrowed short-term and invested in long-term maturity instruments – along the US yield curve, and the rebalancing of portfolios occurred without abnormally high volatility. Indeed, as explained in this review, long-term nominal interest rates remained well below consensus expectations for nominal GDP growth over the same horizon.

Added to the ample global liquidity associated with large official inflows into US bond markets, the appetite of institutional investors and hedge funds for bonds with very long maturities has been increasing against a background of debate on pension reform in the US. This is because the extent of under-funding of pension plans is sizeable, in part because of the low level of long-term interest rates, and because duration – or interest rate risk – mismatches between defined benefit pension fund liabilities and assets have grown since the late 1990s. These mismatches surfaced as funds progressively raised the share of equities in their portfolios, attracted by the high but ultimately ephemeral returns generated by the equity bull market.

In the euro area, structural factors have also played a role in holding long-term interest rates down, although these rates have remained more closely tied to the underlying fundamentals. The implementation of the International Accounting Standards (IAS), as well as more constraining regulations in some countries, could be forcing life insurance companies and pension funds to better match the interest rate risk of their liabilities with fixed income assets. This has favoured the issuance of bonds with very long maturities over the past six months, and should contribute positively to financial system stability.

Even though long-term rates in the euro area have remained close to their intrinsic value and therefore do not appear to represent an independent source of vulnerability, risks could still arise through the correlation between US and euro area long-term bond yields, which tends to be high at times of market stress. In the event of an unexpected disruption in the US Treasury market, it is unlikely that the euro area financial system would be left unaffected. Global over-the-counter (OTC) interest rate derivatives markets – which are known to be highly concentrated – could endure strains from dynamic hedging activity. The concentration in these markets, where several large euro area financial institutions have counterparty exposures, could increase the vulnerability of the global financial system to disruption. Moreover, risks could spill over to the euro area financial system, including through unhedged interest rate exposures of some euro area financial institutions or through exposures to hedge funds.

The relative unresponsiveness of asset prices to the changing direction of US monetary policy has not been confined to government bond markets. Spreads across the credit quality spectrum of corporate bond markets as well as emerging market economy bonds remained relatively unperturbed. Likewise the volatility implied in options prices remained at very low levels across several asset classes, possibly induced, in part, through an arbitrage process with credit spreads via collateralised debt obligation (CDO) markets. While improving fundamentals have undoubtedly played an important role in supporting these asset prices, there is some concern that very low interest rates and abundant sources of liquidity may have led investors to perceive risk as being very low and/or to accept less compensation for holding risky assets. The resulting hunt for yield, which began in the course of 2003, seems to have spread across many asset markets – including more recently, small and mid-cap stock markets – and has also continued to favour the growth of the hedge fund industry.

The vulnerability of pricing in credit markets to reappraisal was recently demonstrated in spring 2005 by concerns about rising credit risks in the US automobile industry, which spilled over to euro area corporate bond markets. To the extent that a search for yield has more broadly pushed asset prices beyond their intrinsic value, this may have sown the seeds of future vulnerability, both in financial markets and for financial institutions, especially if it implies that investors have underestimated risks. Indications that hedge funds have been taking increasingly similar investment positions – or "crowding" trades – pose risks of adverse market dynamics and the risk of dislocation in the case of attempts to exit positions simultaneously. Moreover, the interplay between equity market volatility and credit spreads may have served to underpin a trend of rising leveraged credit investment – where CDOs of CDOs gained in popularity. This may have left credit derivatives markets vulnerable to adverse disturbances.

Financial institutions, including euro area banks, that hold fixed income securities may yet face greater than normal interest rate risks. 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 widen spreads in corporate bond markets. Moreover, in an environment where market volatility has remained relatively low, those institutions that manage their financial risks using, among other tools, value at risk (VaR) approaches[1], may have underestimated the potential for market risk to increase at times of stress.

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

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 credit risk transfer (CRT) markets – and on balance sheet conditions in the two sectors. Over the past six months, private sector balance sheet conditions have continued to diverge. While firms continued to strengthen their balance sheets, household balance sheets expanded further. Although vulnerabilities remain within the corporate sector, by and large the balance of risks has continued to tilt towards households, especially in some euro area countries.

Thanks to persistent strength in the profit growth of firms, together with continued cost-containment, there are indications that the condition of corporate sector balance sheets has been generally enhanced over the past six months. Strong cash flow improved the ability of firms to service debts and eased demands for external sources of funding. Credit ratings have continued to acknowledge this improvement – in Q4 2004, rating upgrades exceeded downgrades for the first time since Q2 1998 – while other market-based indicators of credit risk, such as expectations of the frequency of default over the coming 12 months, indicated further positive reassessment for larger firms.

Although the outlook has improved, vulnerabilities remain within the corporate sector. There are indications that firms have shortened the effective maturities of their debts, thereby making balance sheets more interest rate sensitive. For enterprises whose revenues rely more heavily on the strength of domestic demand, pressure for cost-cutting may remain in the period ahead, especially given further rises in energy costs. The number of insolvencies in the euro area rose in 2004, and forward-looking indicators of the frequency of default for smaller firms over the coming 12 months suggest that little improvement can be expected in 2005. This means that it cannot be ruled out that banks may be faced with further corporate loan losses in the period ahead, although so far these have remained contained, as insolvencies have been concentrated among very small firms so that bank exposures are likely to prove well diversified. There are some indications that the terms of bank financing of small and medium-sized enterprises (SMEs) have become easier, in part because of intense competition. While this has improved access to funding, there are some concerns: to the extent that this has delayed a process of balance sheet strengthening in some euro area corporate sub-sectors or raised the leverage of borrowers that were already heavily indebted, it may have laid the foundations for balance sheet vulnerabilities in the next cycle.

Household sector indebtedness in the euro area scaled new heights towards the end of 2004, although it still remained low by international standards and debt-to-financial asset ratios remained comfortable. The asset side of household balance sheets also expanded, thanks primarily to further house price appreciation in some countries.

At an aggregate level, it appears unlikely that reasonable interest rate swings would diminish the strength of household balance sheets to the point of significantly raising the credit risks faced by banks across the euro area. This is partly because it is often banks or investors in mortgage bonds rather than households that bear the bulk of interest rate risks in mortgages, given the preponderance of fixed-rate or quasi-fixed-rate[2] contracts in the euro area. As for exposures to the risks of property price reversals, although signs of intensifying competition in mortgage markets may have led to a loosening of credit standards, banks appear, by and large, to have carefully managed the risks to collateral behind mortgages by setting loan-to-value ratios at conservative levels. This means that households would

2 Some mortgage contracts have periods of fixation that are shorter than the term of the contract.

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. This notwithstanding, there are significant differences in the level of household indebtedness and exposures to interest rates across the euro area. Credit risks for banks could however prove larger in the handful of countries where house prices have risen beyond their intrinsic value, where indebtedness is high and where the stock of outstanding mortgage loans is primarily serviced at floating rates. This is because households in these countries are vulnerable to the possibility of rising interest rates on both sides of their balance sheets.

PERFORMANCE OF EURO AREA BANKS

The evident signs of improvement in the performance of the largest euro area banks in the first half of 2004 were sustained in the second half of the year. On aggregate, both profitability and solvency measures improved, even among the weakest performing banks.

Generally, the share of banks' net interest in total income remained static during 2004, mainly due to narrow interest rate margins. Banks managed to compensate for this in various ways. In some countries where the pace of economic activity was stronger than the euro area average, some managed to do this by increasing lending volumes. In other countries, where growth was slower, banks either expanded their non-interest income sources of income, for example by raising exposures to riskier investment sources such as hedge funds, or they cut costs further through labour shedding or branch closures. Across most euro area countries, however, the strength of profitability was underpinned by a marked reduction in provisioning for loan losses.

The improving financial condition of the euro area banking sector notwithstanding, the credit risk outlook rests primarily on the outlook for economic activity and interest rates. In an environment where demand for corporate credit has remained subdued, banks have become increasingly dependent on income derived from mortgage lending activity and from fees and commissions. This has left them exposed to risks that these sources of income could moderate if the pace of economic activity were unexpectedly to deteriorate or if long-term interest rates were to rise abruptly. While provisioning patterns in most countries have reflected readjustments from greater than normal levels as well as improvements in credit risk, there are concerns that provisioning could prove inadequate in the face of an unexpected deterioration in the economic outlook especially given the thinness of interest rate margins. This calls for close monitoring in the period ahead. Furthermore, continued weakness in the commercial real estate sector in some large countries could pose risks for banks.

The need to generate revenues from non-interest sources may, through a search for yield, have exposed banks to greater market risks than normal – including the possibility of capital losses on fixed income securities – stemming from the possibility of an abrupt upturn in long-term interest rates. While not priced into market yield curves, this risk is priced into options markets as a low probability event. Banks with prime brokerage links to hedge funds may also be indirectly exposed to market risks. Changes in VaR readings for some of the largest euro area banks indicate that exposures to interest rate risk generally increased in the second half of 2004, although these yardsticks do not paint a uniform picture, as different banks seem to have changed their exposures to different market segments. In addition, VaR measures have remained small in relation to banks' capital.

Forward-looking indicators based on asset prices suggest that the outlook for the euro area banking sector has continued to brighten. Banks' stock prices not only increased after November 2004, but also outperformed the

broader euro area stock market, reflecting a positive assessment of their generally strong performance in 2004 and expectations of further improvements in profitability. This outlook is confirmed by private sector analyst forecasts of future banking sector profitability and by patterns in banking sector credit risk indicators, which also suggest more optimistic market perceptions than six months ago. All in all, this implies that either the likelihood of the main risks and vulnerabilities crystallising is judged as being low, or that banks are assessed as being better positioned to absorb adverse disturbances. However, the message emerging from market-based indicators should always be interpreted with caution, especially when there are questions about the appropriateness of pricing in some fixed income markets.

FINANCIAL CONDITIONS OF INSURANCE COMPANIES

The outlook for the insurance industry as a whole seems to have improved over the past six months, thanks to the overall strengthening of stock markets which helped to fortify balance sheets. Even though expected default frequencies over the next 12 months for the most fragile insurers have remained at high levels, most market-based indicators suggest that the risks facing the insurance sector have declined overall.

This notwithstanding, some risks do lie ahead. In the euro area life insurance sector, where solvency pressures have remained, investment returns are likely to remain rather subdued, so that strong underwriting performances and tight cost control will be critical in order to maintain profitability and rebuild capital. 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 who raised their holdings of fixed income assets, by impinging on investment returns. For these firms, a rise in long-term interest rates would more than likely lead to significant balance sheet strengthening.

OVERALL ASSESSMENT

The robust pace of global economic activity in 2004, together with a strengthening of the balance sheets of large euro area firms and financial institutions, has contributed positively to the euro area financial stability outlook. However, several potential sources of risk and vulnerability have grown in importance. While an easing of credit risks underpinned an improvement in the profitability of major euro area banks in 2004, declining provisioning levels could adversely affect their ability to cope with unforeseen disturbances. In addition, the possibility 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 vulnerable to global liquidity conditions and unexpected credit events. A disorderly correction 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 could benefit as this would help in relieving remaining balance sheet vulnerabilities.

Looking ahead, despite a further effective depreciation of the US dollar, the risk of a disruptive unwinding of global imbalances remains, especially because these imbalances could widen further. It also seems that anaemic domestic demand in the euro area has left the balance sheets of small and medium-sized enterprises vulnerable to adverse disturbances. Household balance sheets may also be vulnerable in countries where house prices seem to have risen beyond their intrinsic value.

II THE MACRO-FINANCIAL ENVIRONMENT

1 THE EXTERNAL ENVIRONMENT

1.1 RISKS AND FINANCIAL IMBALANCES IN THE EXTERNAL ENVIRONMENT

In 2004, the overall pace of global economic activity was the fastest recorded since 1980. Some slowdown was, however, observed in the course of the year. This moderation was common to all regions, but was most pronounced in Japan. While the outlook for global growth remains favourable, some risks do remain, including those posed by wide global financial imbalances and elevated oil prices.

US CURRENT ACCOUNT FINANCING

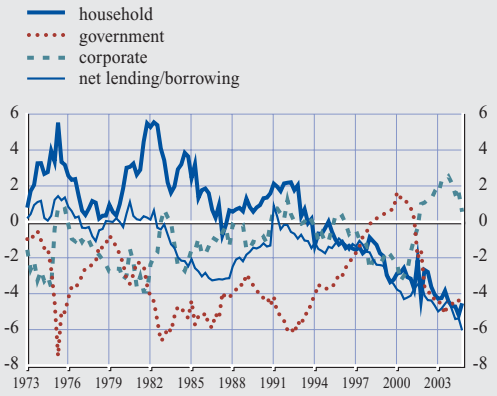
The financing of large and growing US current account deficits continues to pose significant risks for global financial stability. This is because they place pressures on international capital markets – including those in the euro area – and because their accumulation raises questions about medium-term sustainability. Whether the risks associated with US external imbalances crystallise mainly depends on the willingness of foreign investors, both official and private, to increase their holdings of US securities. If this willingness were to diminish, it could trigger an increase in financial and exchange rate market volatility.

The US current account deficit expanded further during 2004 to reach 6.3% of GDP in the final quarter of the year. The main counterparts of this deficit have been current account surpluses in Asia, especially China, Japan and some Middle Eastern countries. The domestic sources of the current account deficit included growing fiscal imbalances and heavy household sector borrowing. While the corporate sector had a financing surplus in 2004 (see Chart 1.1), the latter continued to decline in 2004 and could turn negative in response to the strong pace of business expenditure on fixed capital.

Despite further expansion of the US current account deficit, which totalled USD 666 billion in 2004, net foreign purchases of US bonds and notes, which amounted to USD 886 billion over the same period, more than matched the financing requirement (see Box 1). However, inflows from foreign official sources seemed to decline during 2004 and the first quarter of 2005, partly because intervention in the foreign exchange markets by the Japanese authorities came to an end in the first quarter of 2004. At the same time, there were indications that foreign investor preferences had shifted from US government bonds and notes to private, especially corporate, bonds and equities. While flows into private assets amounted to 26% of total net purchases in the first half of the year, this share rose to 60% during the second half of the year, according to the US Treasury. Notwithstanding a rebound of investment into official assets in early 2005, the redirection of international capital flows experienced in 2004, if prolonged, could remove an important source of support for the US government bond market.[1]

Chart 1.1 Net lending/borrowing of the US economy

(Q1 1973 - Q4 2004, % 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.

1 Selected empirical studies suggest that dollar-denominated Japanese interventions worth USD 1 billion would lead, on average, to declines in both five and ten-year US Treasury yields of 0.66 basis points, based on estimates over the period from January 2000 to March 2004. See B. S. Bernanke, V. R. Reinhart and B. P. Sack (2004), "Monetary Policy at the Zero Bound: An Empirical Assessment", Federal Reserve Board, Finance and Economics Discussion Series, No 2004-48.

Box 1

US CURRENT ACCOUNT: INTERACTION WITH THE INTERNATIONAL INVESTMENT POSITION AND ADJUSTMENT CHANNELS

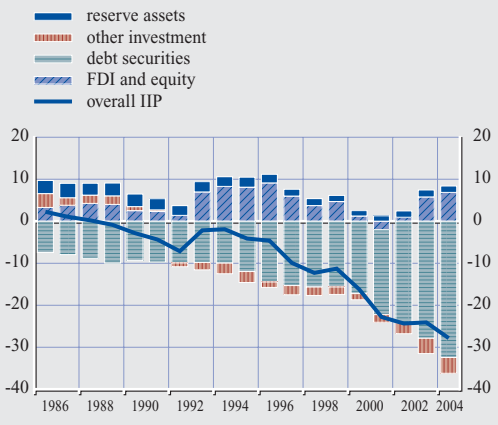
Large and growing global current account imbalances may be an increasing source of tension in the world financial system as they pose risks for financial and exchange rate market volatility, ultimately affecting the optimal allocation of world savings. These risks are well recognised in both academic and policy quarters, and there is a broadening consensus that the current composition of global current accounts could prove unsustainable from a long-term perspective, with the evolution of the US current account being seen as a key factor. This Box highlights specific trends that could undermine the sustainability of the US current account relative to its international investment position (IIP). It also discusses the possible channels through which an adjustment of global imbalances may take place.

As far as the US is concerned, the accumulation of large current account deficits brought its IIP – measuring the stock of US claims on foreign assets net of foreign claims on US assets – to a historical low of -28% by end-2004 (see Chart B1.1).[1] The sustainability of this net debtor position largely hinges on the interaction between the US current account and its net external liabilities. In this context, two aspects should be highlighted:

First, the relevance of valuation effects on the stock of foreign assets and liabilities is large, in an interaction running from the current account to the net external position. Despite cumulative net capital inflows to finance the current account deficit in the US to the order of 5% of GDP per year, the US IIP deteriorated by only 1.5 percentage points between 2002 and 2003 (see Chart B1.2). The difference is accounted for by GDP growth and, more importantly, by changes in the valuation of assets and liabilities that have been mainly produced by exchange rate

Chart B1.1 US international investment position

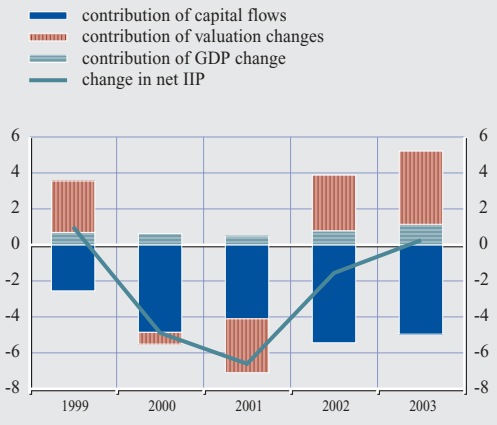
(% of GDP)



Sources: IMF and ECB calculations.

Chart B1.2 Changes in the US net IIP/GDP ratio

(% of GDP)



Sources: IMF and ECB calculations.

1 The data exclude valuation changes.

fluctuations. In particular, the depreciation of the US dollar after February 2002 led to a revaluation of US external assets, which are largely denominated in foreign currency, whereas the bulk of US foreign liabilities are denominated in US dollars. This valuation effect, a by-product of the international role of the dollar, brought about a cumulative capital gain for the US of almost USD 700 billion, or around 7% of GDP, between 2002 and 2003. The importance of these valuation changes tends to increase with the sheer size of US net foreign liabilities, even though, barring a persistent depreciation (or appreciation) of the dollar, their impact over the medium term should eventually be overshadowed by the flow variable, i.e. the current account and its counterpart in terms of financial flows.[2]

Second, it is also important to highlight the impact of an increasingly negative foreign debt position on the balance on income. Since 2001 the US current account deficit has been largely financed by foreign purchases of debt securities, different to the pattern of the late 1990s, when foreign direct investment (FDI) and equity inflows made a positive contribution. The increasingly negative US external position can be attributed to the accumulation of foreign debt, which is expected to generate growing debt servicing obligations, and will have a negative impact on the US current account through the balance on income (see Chart B1.1). In recent years, and despite a deteriorating net foreign position, the US balance on income consistently posted surpluses thanks to relatively low income outflows related to FDI in the US compared with income inflows of US direct investment abroad and, more recently, very low yields on US debt securities. However, according to several projections,[3] the possibility of a sizeable rise in US interest rates together with the building up of stocks of foreign-owned US debt in recent years would most likely bring the balance on income into negative territory in the coming years, thereby complicating the unwinding of the US current account deficit.

Looking forward, three main adjustment channels have been identified by international institutions, policy authorities and academics as possible ways of closing global imbalances.[4] First, considering exchange rate adjustment in simulations, a 10% depreciation of the US dollar vis-à-vis all currencies would, beyond some short-term positive impacts related to improved competitiveness, most likely have a negative effect on US real output through a deterioration in financing conditions. Effects for the rest of the world (and the euro area in particular) would most likely prove negative, owing to declining competitiveness and decreasing foreign demand. Under the same assumptions, all models indicate a reduction in the US current account deficit of between 0.4% and 1.1% of GDP over three to six years.

Second, looking at current account deficits as a saving-investment imbalance, an increase in US savings by both the public and the private sectors would appear to be a natural channel enabling the correction of the US current account deficit. Fiscal consolidation in the US appears to be the main policy for achieving such an adjustment, apart from targeted measures to

2 For a general discussion of these valuation effects, see P. R. Lane and G. M. Milesi-Ferretti (2005), "Financial globalization and exchange rates", IMF Working Paper, No 05/03. For an analysis of the US case, see C. Tille (2003), "The Impact of Exchange Rate Movements on U.S. Foreign Debt", Current Issues in Economics and Finance, Vol. 9, No 1, Federal Reserve Bank of New York.

3 See, for instance, N. Roubini and B. Setser (2004), "The US as a Net Debtor: The Sustainability of the US External Imbalances", New York University, November; and R. Berner (2004), "Upside Risks for U.S. Current Account", Morgan Stanley Global Economic Forum, October.

4 See among others M. Obstfeld and K. S. Rogoff (2004), "The Unsustainable US Current Account Position Revisited", NBER Conference paper; and J. W. Lee, J. McKibbin and Y. C. Park (2004), "Transpacific Trade Imbalances: Causes and Cures", Brookings Discussion Papers No 162.

increase the historically low levels of personal saving. A fiscal consolidation in the US – comprising an improvement in the US fiscal balance of 2.5% of GDP – would likely have a negative effect on US growth. The effects on the euro area would most likely prove negative, but limited over time. For the US current account, an improvement of around 1.1–1.3% of GDP could be expected. The size of the adjustments is consistent with the 50% ratio between fiscal and current account balances, which is often seen as a reasonable rule-of-thumb by many studies.

Third, faster growth outside the US is also considered to be a possible channel for closing imbalances. By increasing the demand for US goods, an increase in global growth would reduce the US current account deficit by boosting US net exports. According to some studies, a 0.5 percentage point (pp) permanent rise in rates of growth in OECD countries outside the US would reduce the US current account deficit by only 0.2 pp after six years. A fiscal stimulus in non-Japan Asia would have limited effect on the US current account deficit. However, other studies suggest that a combination of faster productivity growth outside the US and exchange rate adjustment would generate a relative acceleration in output and domestic demand beyond the borders of the US, and would correspondingly reduce global current account imbalances significantly.

To sum up, even though the different models mentioned so far are not directly comparable, three main conclusions can be drawn from their results. First, exchange rate adjustments could help in easing global imbalances, although very large moves would be needed to produce a significant impact. Second, an increase in US savings, either private or public, would be necessary to maintain the current investment rate and at the same time close the external gap. In this context, a fiscal consolidation in the US seems to be a necessary step, although household behaviour in the consolidation period is important. In the absence of such a consolidation, the continued build up of stocks of foreign-owned US debt, possibly accompanied by an upward shock in interest rates, might imply a deterioration in the balance of income and thus produce an additional burden associated with the adjustment of the external deficit. Third, a reduction in the relative growth performance between the US and the rest of the world may be relatively efficient over a very long horizon, especially if it results from an adjustment in productivity differentials. However, this adjustment channel is much less effective in the short to medium term.

US FISCAL IMBALANCES

Although relations between current account and fiscal imbalances are not generally one-for-one,[2] the experience of many countries, including the US in the 1980s, is that twin current account and fiscal deficits have tended to be associated with abnormally high real interest rates. Hence, 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, via their impact on real interest rates.

In 2004, the US federal budget deficit was 3.6% of GDP (or USD 412 billion), up from 3.5% in 2003 and the largest in eleven years in GDP

2 At least two mechanisms support this hypothesis. First, Ricardian equivalence suggests that private agents may offset any decrease in public saving by an equal increase in their saving, in anticipation of the future tax burden that results from the higher budget deficit. Second, the interest rate increase triggered by a higher budget deficit is likely to crowd out investment and to stimulate private saving, resulting in a lower current account deficit, the current account being equal to the difference between domestic saving and investment through a well-known accounting identity.

terms. As a result, the US public sector debt-to-GDP ratio increased further during the second half of 2004 to reach 62.3%, a level not seen since the last quarter of 1999 (see Chart S4). During the year, the net issuance of marketable securities, bills and coupons by the US Treasury totalled USD 363.9 billion. Of this amount, foreign official institutions absorbed USD 203 billion in net purchases.

Looking ahead, a slight improvement in the US budget deficit is expected for 2005 with an easing to around 3.5% of GDP. Further ahead, the US administration expects to lower the deficit to 1.5% of GDP by 2009 which, if these rather optimistic expectations are met, should contribute to easing US imbalances more generally. In this respect, since the deficit has become more structural than cyclical, reforms aiming at containing spending on entitlement programmes on one side and expanding federal revenues through tax reforms on the other side, appear to be important for restoring the fiscal balance.

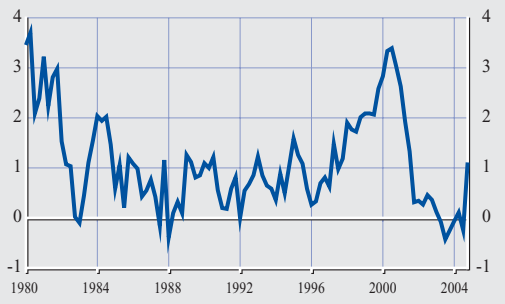
US CORPORATE SECTOR BALANCES

The financial condition of US corporations can be important for euro area financial stability for several reasons. Many euro area financial institutions have direct exposures to the US corporate sector through lending. Conditions in the US corporate sector may also affect the financing costs faced by large euro area firms in global capital markets, both through competing demands for funds as well as in the global pricing of corporate sector credit and equity market risks.

In nominal terms, US non-farm, non-financial corporate profits (after corporate income taxes) reached a historical high in the last quarter of 2004. The main factors underpinning this included productivity growth, stable demand and the effects of earlier cost-cutting programmes. Despite improved profitability, strong cash flows and a decline in gross investments, US non-farm, non-financial corporations became significant net borrowers of funds in late 2004, as capital expenditure exceeded cash flows (see Chart 1.2). The main explanation for the significant widening of the corporate sector financing gap in the final quarter of 2004 was a notable, but possibly non-recurrent, 50% year-on-year increase in net dividend payments. This was motivated by a change in tax laws in 2003 that favoured the paying of dividends.

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

(Q1 1980 - Q4 2004, % of GDP)

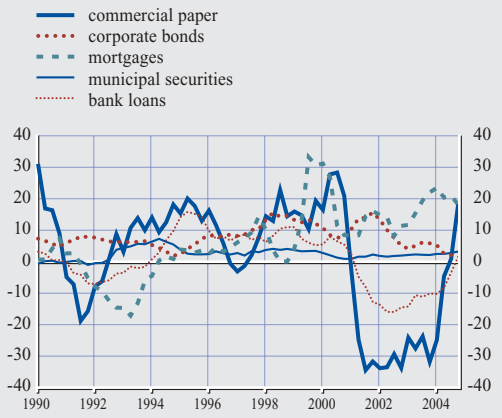


Source: US Federal Reserve Board.
Note: The financing gap equals capital expenditures less internal funds and inventory valuation adjustments.

Notwithstanding the widening of the financing gap, when expressed as a proportion of GDP, the level of corporate sector debt more or less stabilised during 2004 (see Chart S1). Debt restructuring continued, and there were indications that throughout 2004 firms had increasingly transformed their liabilities into short-term obligations at lower interest rates, thereby exposing themselves to greater risk should short-term interest rates pick up. Although bank loans and corporate bond issuance constitute the major credit market instruments used by corporations for raising funds – together accounting for close to 70% of total external corporate credit financing – a notable pattern was a significant pick-up in issuance in the commercial paper market, a market that had dried up after 2001 (see Chart 1.3). The strength of commercial paper issuance might, in part, have been linked to significant improvements in the credit ratings of large US firms after early 2003.

Chart 1.3 Growth of US corporate liabilities

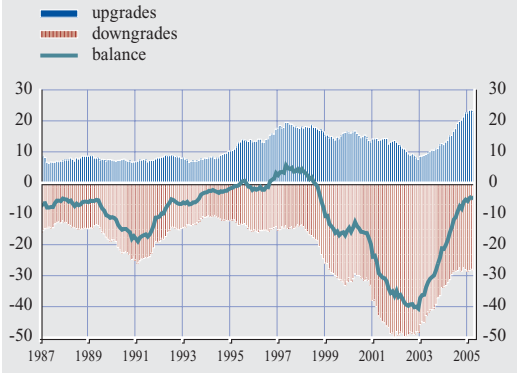
(Q1 1990 - Q4 2004, % per annum).



Source: US Federal Reserve Board.

Chart 1.4 US corporate sector rating downgrades, upgrades and balance

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



Source: Moody's.

The asset side of corporate sector balance sheets grew by 5.4% year on year in the final quarter of 2004, mainly driven by an increase in financial assets, indicating that corporations had further improved the liquidity of their balance sheets.

Against a background of general strength in the US economy, increased profitability, favourable financing conditions, balance sheet restructuring and improved solvency – as indicated by further declines in liability-to-asset ratios (see Chart S2) – the credit ratings of US corporations continued to improve after late 2004, although, on an annual basis, downgrades still exceeded upgrades (see Chart 1.4).

All in all, indications are that the credit risk posed by the US corporate sector continued to ease after late 2004, although some risks nevertheless remain. Just as profits were partly bolstered by declining interest rates after 2000, the recent upturn in short-term rates can be expected to cut into US corporate sector profitability, especially given indications that the short-term interest rate sensitivity of US corporate sector balance sheets has increased.

There are also some other risks facing US firms, particularly the already troubled energy-intensive and energy-sensitive industries (e.g. airlines and the automobile industry), which face risks to their cost bases associated with the strength of oil prices.

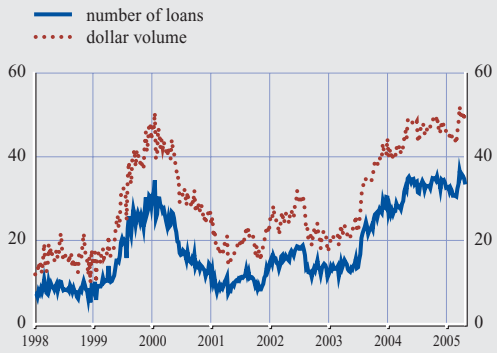
US HOUSEHOLD BALANCES

For euro area financial stability, the main channels through which US household sector imbalances can be a source of risk include the direct exposures of euro area banks to this sector, or indirectly, through exposures to US credit institutions which are themselves exposed to the sector, or finally through holdings of mortgage-backed securities issued by US credit institutions.

The debt-to-disposable income ratio of US households continued to rise in the second half of 2004, going from a relatively high level to scale unprecedented heights in the fourth quarter of the year (see Chart S3). Rising household sector indebtedness continued to be driven primarily by increased mortgage borrowing, although consumer credit growth was also relatively strong.

Chart 1.5 Share of adjustable rate mortgages in the US

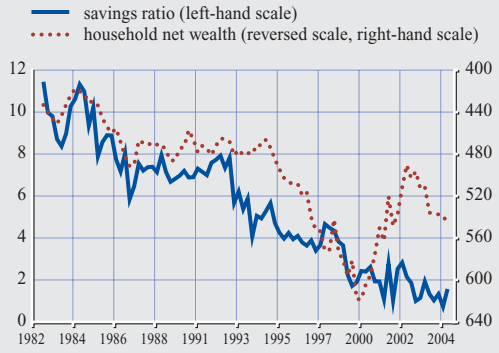
(Jan. 1998 - Apr. 2005, % of total applications)



Source: Mortgage Bankers Association Weekly Survey.

Chart 1.6 US personal saving and household net worth

(Q3 1982 - Q4 2004, % of household disposable income)



Source: US Federal Reserve Board.

Notwithstanding rising indebtedness, there have been few indications that US households are facing challenges in meeting obligations on their debts. The household debt service ratio and the wider financial obligations ratio[3] have both remained fairly stable since 2003, after peaking at the end of 2002 (see Chart S4).

An extremely high percentage of outstanding US mortgage debt – between 85% and 90% – is thought to be contracted at relatively low fixed interest rates, following unparalleled mortgage refinancing in 2003, and is thus sheltered from interest rate increases.[4] However, after mid-2003 the share of adjustable-rate mortgages (ARMs) in new mortgages rose significantly, reaching half of the total in March 2005 (see Chart 1.5). Thus, the exposure of US households to rising short-term rates has increased, which to some extent reflects the very low level of short-term rates relative to long-term ones.

Owing to rising real estate valuations and stock prices,[5] the value of US household assets grew by 9.4% during 2004, albeit less rapidly than liabilities. Nevertheless, and even though US household savings ratios have remained very low, net worth continued to improve (see Chart 1.6), as household assets exceed liabilities by a considerable margin.

All in all, even though US households appear to face risks on both sides of their balance sheets, credit risks facing financial institutions appear to have eased. Further improvements in net worth, together with a stable debt service ratio and improved labour market conditions, all suggest that the risk that US households will face financial distress has eased over the past six months. However, the strength of house price inflation – which has continued to outstrip growth in both rents and disposable incomes – and the increasing share of adjustable-rate mortgages continue to raise questions about the vulnerability of US household balance sheets to rising interest rates.

RISKS IN NON-EURO AREA EU COUNTRIES

Developments in the general economic outlook of non-euro area EU countries in the six months

3 The household debt service ratio 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 wider financial obligations ratio, a broader measure, adds automobile lease payments, rental payments on tenant-occupied property, homeowners' insurance and property tax payments to the debt service ratio.

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

5 At the national level, according to the Office of Federal Housing Enterprise Oversight (OFHEO), US house prices rose by 11.2% during 2004. Over the same period, the S&P 500 stock price index increased by 9.3%.

following the December 2004 Financial Stability Review (FSR) did not change substantially.

In the United Kingdom, at 3.1% on average, the pace of economic activity remained fairly strong in 2004. Against this background, corporate and household sector indebtedness continued to rise. The gearing of private non-financial firms remained high, but profitability remained strong and the number of insolvencies fell. Favourable prospects for real disposable income growth and the very low level of unemployment at the end of 2004 are furthermore expected to limit default rates on secured lending.

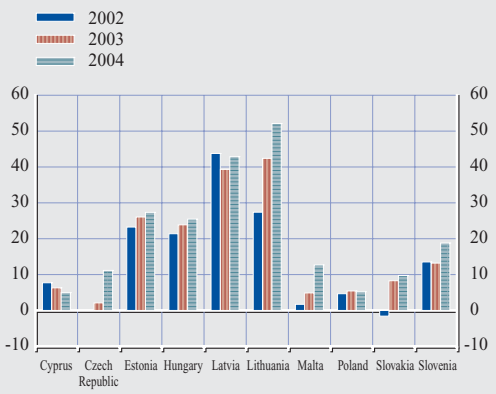
In Denmark and Sweden, macroeconomic expansion continued in 2004, mainly driven by domestic demand. In Denmark, non-financial companies resumed borrowing to finance new investment: their borrowing from banks increased 7.4% during 2004, outpacing nominal GDP growth. Although insolvencies increased by 4.5% in 2004 as a whole, nearly all of them were among small and medium-sized enterprises (SMEs), and the number of insolvencies fell by 16.6% in the first quarter of 2005. In Sweden, the condition of the corporate sector improved: debt ratios fell and there was an improvement in solvency, even among SMEs, which account for 90% of corporate bankruptcies. Household debt continued to grow at 11% year on year, mostly for housing purposes, but households' ability to service debt was still judged by banks to be high.

Output growth and especially domestic demand remained particularly buoyant in the Baltic countries. As a result, private sector borrowing accelerated further in this region, reaching average annual rates of between 27% and 52% in 2004 (see Chart 1.7). Borrowing by the Estonian corporate sector from banks continued to rise in 2004, partially owing to a switch from foreign to domestic borrowing. Household indebtedness – mainly through taking out housing loans – continued to expand further, rising from 19% of GDP in 2003 to 25% at the end of 2004. In Latvia, corporate profitability dropped below the high levels recorded in 2003, but rose towards the end of the year. Household indebtedness increased, although remaining at a relatively low level: the household debt-to-GDP ratio reached 19% at end-2004 (up from 13% at end-2003). In Lithuania, corporate sector leverage increased, as financial liabilities to total assets rose to 17.8% by end-2004 (14.5% at end-2003). However, profitability remained strong (21%). Household indebtedness increased to stand just above 10% at the end of 2004: most loans to households were for housing purposes, and 73% of the latter were denominated in euro.

In the Central and Eastern European countries (CEEC), GDP growth strengthened across the board in 2004. The pace of private sector borrowing increased further, reaching average annual rates of between 5% and 25% in 2004 (see Chart 1.7). On average the health of the corporate sector in the CEEC strengthened, especially for larger firms. In Poland, corporate profitability increased in 2004, both for large and small companies, and the deleveraging that started in 2002 continued. However, SMEs remained more exposed to liquidity shortages. Households' borrowing, mostly for housing purposes, continued to grow rapidly in 2004

Chart 1.7 Growth of MFI credit to the private sector in the EU10

(2002 - 2004, % per annum)



Source: ECB.
Note: 2002 data for the Czech Republic are not available.

(+21.1%), although households' indebtedness remained low by international standards: bank loans amounted to 33% of gross wages and social benefits. In the Czech Republic, the growth in bank lending (7.4% in 2004) was mostly driven by borrowing by enterprises controlled by domestic owners, with some signs of renewed borrowing by SMEs. Household sector borrowing continued to grow strongly, mostly for housing purposes (+34.3% and 50.8% respectively in 2004). In Hungary, on the basis of preliminary evidence, corporate sector leverage remained broadly unchanged in 2004. Household indebtedness increased further in 2004: despite a slowdown in household lending growth, household debt as a percentage of GDP rose from 15.1% at the end of 2003 to 18.7% in the third quarter of 2004. In Slovakia, the gross profit of corporates increased by 24.3% in 2004 on a year-to-year basis, driven mainly by higher sales. Corporate lending by banks in foreign currency rose by 17% in 2004, while lending in domestic currency fell by 5%. Borrowing by households from banks increased by almost 37% in 2004, with the majority of loans denominated in Slovak koruna. The average loan-to-value ratio was 60%.

The rapid credit expansion experienced in some Baltic and CEEC countries could ultimately pose risks to financial stability, particularly in countries with more flexible exchange rate regimes and where there is evidence that the proportion of foreign currency borrowing is high. If the appreciating trend were to reverse in the future, debtors in foreign currency would be placed in a difficult situation. While currency mismatches on the balance sheets of Baltic and CEEC banks are generally rather small, the banks, many of which have parents in the euro area, could still face indirect risks from firms that have no natural hedges for foreign currency debts.

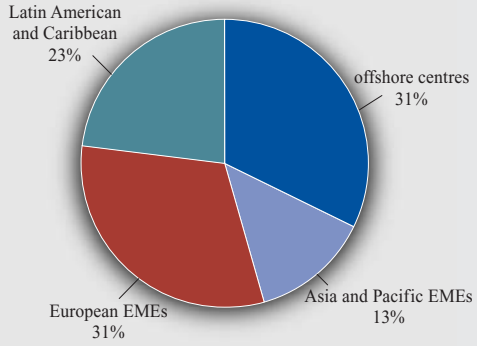
SOURCES OF RISKS AND VULNERABILITY IN EMERGING MARKET ECONOMIES

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 on financial imbalances within and across EMEs. Following the BIS classification of EMEs, data suggest that the EME share in total euro area consolidated foreign claims has remained stable and limited relative to total exposures at just under 16% (or 23% including offshore financial centres, see Table S3). Within the category of emerging markets, emerging Europe has steadily overtaken Latin America as the region with the largest euro area exposures among EMEs, accounting for 31% of foreign claims to non-developed economies in Q3 2004 (see Chart 1.8). This reflects both the ongoing EU enlargement process as well as the strong presence of euro area banks in the region.

As a group, EMEs maintained strong growth momentum into early 2005. The robust pace of activity was underpinned by solid external demand, high international prices for key export commodities, favourable financing conditions and in most cases sound policy implementation by domestic authorities. The outlook for 2005 remains favourable, although in most cases headline growth rates are expected to moderate slightly compared to 2004. Some risks however remain.

Chart 1.8 Euro area banks' consolidated foreign claims on non-developed economies

(Q3 2004, % of all claims on non-developed countries)



Source: Bank for International Settlements (BIS).

First, EMEs remain vulnerable to shifts in global liquidity conditions. Capital inflows to EMEs remained strong in the year to May 2005, leading to currency appreciation pressures in most cases. Monetary authorities have tended to partially or fully mitigate these pressures with a combination of foreign exchange interventions and/or interest rate adjustments. In this environment, emerging market bond spreads have remained close to historical lows despite an increase in mid-March, while bond and equity issuance activity remained brisk (see Sub-section 1.2).

Insofar as emerging market fundamentals have continued to improve in recent months and financial vulnerabilities have declined (see Table S1), concerns about potential mispricings in these markets have been partly mitigated. However, emerging markets still remain vulnerable to an upturn in global interest rates.

Second, emerging markets remain vulnerable to a potential disorderly correction of global current account imbalances, insofar as this is associated with disruption in global capital markets, a deterioration in financing conditions, or a sharp drop in demand from mature economies. In this connection, the fact that reserve accumulation by emerging Asian central banks continued unabated into 2005 – increasing their foreign reserve position by a total of USD 73 billion in Q1 2005 – creates vulnerabilities. The medium to long-term sustainability of global current positions remains in question, particularly in light of the potential cost and difficulties associated with the full sterilisation of capital inflows. The bulk of reserve accumulation has been associated with current account surpluses in all countries except China (where the financial and capital account is dominant); however, the share of reserve accumulation associated with short-term capital inflows has been rising in recent months. Against a background of perceptions that adjustments are also needed in the Asian region for an orderly resolution of global imbalances, expectations of an appreciation of the renminbi in China – which could possibly spill over to other economies in the region – appear to be a key factor, as suggested by the fact that FDI inflows and the trade surplus together accounted for only 45% of the (USD 206 billion) rise in Chinese foreign exchange reserves in 2004, compared with 67.5% in 2003.

Concerning individual regions, downside risks to the Latin American outlook continue to arise from fragile fiscal positions in some countries (such as Argentina, Brazil and Uruguay), due to structural weaknesses in the medium term, while short-term concerns have been dispelled in this context. As for the East Asian economic outlook, currency appreciation pressures and uncertainties over the evolution of monetary and exchange rate policies in key economies constitute the primary risk to the region. In Europe, credit growth has remained strong in many emerging European markets just like in some CEEC and Baltic countries.[6] While credit-to-GDP ratios remain at comparatively low levels, the sheer pace of credit growth, currency mismatches between the currency of denomination of loans (often in foreign currency) and of the earnings of the borrowers (typically in local currency) are sources of potential vulnerability. Moreover, strong credit growth has been associated in many countries with high current account deficits, in contrast to the trend in most other EMEs, which has increased their vulnerability to an abrupt reversal in global liquidity. All in all, as far as the euro area is concerned, risks for financial stability stemming from the emerging market outlook appear contained. To the extent that EME fundamentals have improved and that lingering weaknesses in emerging financial markets have been resolved – notably with the completion of Argentina's sovereign debt restructuring, notwithstanding the issue of holdout creditors – the potential for both direct real and financial market contagion has

6 This includes Russia, the EU candidate countries (Croatia, Bulgaria, Romania and Turkey) and the potential EU candidate countries (Albania, Bosnia and Herzegovina, Serbia and Macedonia) in southern Europe.

diminished. However, in the medium term, the possibility of a disorderly correction of global current account imbalances has not been dispelled. In this regard, Asian exchange rate and monetary strategies will continue to play a prominent role.

1.2 KEY DEVELOPMENTS IN INTERNATIONAL FINANCIAL MARKETS

FOREIGN EXCHANGE MARKET DEVELOPMENTS

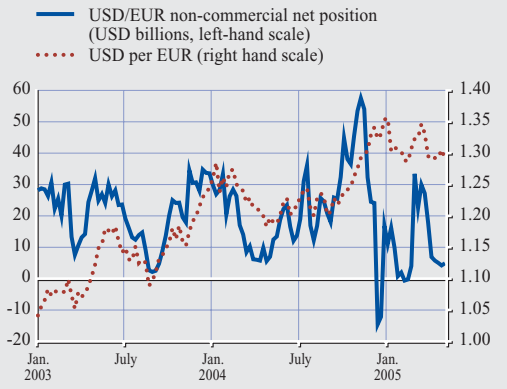
Towards the end of 2004, the US dollar continued its broad-based weakening against all major currencies. The main driving factors behind it seem to have been concerns in financial markets about persistently wide US current account and fiscal deficits. In early 2005, the US currency stabilised, in part related to the announcement of US budget proposals, as well as higher money market rates and signs of robust economic growth in the US.

A persistent issue for foreign exchange markets is that many official authorities, especially in Asia, remained active – through the conduct of foreign exchange intervention – in preventing their currencies from appreciating against the US dollar. In the absence of detailed intervention data, changes in central banks' foreign exchange reserves can provide a proxy for this activity. At the end of 2004, the reserve holdings of the major Asian central banks[7] stood more than USD 500 billion higher than a year earlier, highlighting the large scale of intervention activity.[8] There are, however, questions about the longer-term sustainability of these activities. Against the background of a depreciating US dollar, there have been many unconfirmed reports that central banks around the world have been diversifying their reserve portfolios out of the US dollar.

Turning to forward-looking indicators, net speculative positions – the difference between non-commercial long positions and non-commercial short positions – favouring an appreciation of the euro vis-à-vis the US dollar were back to almost neutral levels by mid-April 2005, after having reached a series of all-time highs in November 2004 (see Chart 1.9).

Chart 1.9 Speculative USD/EUR net positions and the USD/EUR exchange rate

(Jan. 2003 - May 2005)



Source: Bloomberg.

In early 2005, a notable pattern in foreign exchange markets was a further lowering of the volatilities implied in currency options. Implied volatility on one-month USD/EUR and JPY/EUR options, which were already at low levels in late 2004, declined further in early 2005, remaining below longer-term averages (see Chart S11). One of the contributing factors appeared to be market perceptions that some countries would continue to intervene with the aim of stabilising exchange rates. Another factor potentially contributing to the low level of implied volatilities may have been the ongoing hunt for yield, whereby some investors wrote options to generate some additional yield pick-up. Overall, implied volatilities suggest that market participants attach little likelihood to any near-term disruption in the foreign exchange markets, although the risk of pricing distortions cannot be excluded.

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

8 This increase also reflected valuation changes from exchange rate developments, e.g. an increased USD value of EUR-denominated reserves. However, this effect is generally viewed as being significantly less important than the continued accumulation of USD reserves arising from intervention activity.

Regarding the most liquid currencies of the new EU Member States, the period after mid-November 2004 was characterised by further appreciation against the euro of the Hungarian forint, the Polish zloty, the Czech koruna and the Slovak koruna due to portfolio and direct investment inflows. By mid-March 2005, the Hungarian forint had appreciated to the top of the +/-15% exchange rate band that Magyar Nemzeti Bank operates around the central parity of the forint against the euro.[9] In some cases the appreciation pressure was so strong that the respective central banks reacted by lowering interest rates and/or conducting foreign exchange interventions. By mid-March, however, a significant correction of the appreciation trend had occurred in all of these currency pairs, suggesting that much of the activity had been speculative. In particular, there have been indications that speculative accounts such as hedge funds have been increasingly active in these currency pairs.

US MONEY MARKETS

Conditions in the US money markets are important from a euro area financial stability perspective because the US money markets are the markets in which banks – including counterparties of euro area banks – usually secure their day-to-day liquidity needs. Any disturbance in the functioning of these markets could give rise to liquidity problems with the potential for a spillover to the euro area financial system.

As evidence became clear of a strengthening of the US economy and, particularly, of improving labour market conditions, the Federal Reserve continued to remove the monetary policy accommodation it commenced in June 2004. The Federal Open Market Committee (FOMC) increased interest rates by 25 basis points at each of its meetings from 30 June 2004 onwards. All together, by the beginning of May 2005, the Fed Funds target rate had been raised by a total of 200 basis points to 3.00%.

At the beginning of May, market participants were generally expecting a continuation of the measured pace of interest rate hikes for the months to come. Fed Funds futures contracts were almost fully pricing in three more interest rate hikes of 25 basis points for the remaining five FOMC meetings in 2005, with the Fed Funds target rate thus generally expected to reach 3.75% by the end of the year.

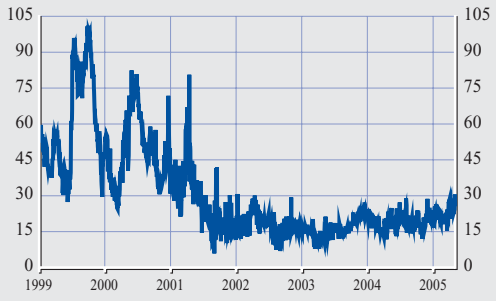
The so-called TED spread – the difference between uncollateralised money market interest rates and risk-free Treasury bill rates – can provide an indication of how money market participants perceive counterparty credit risk. The latter was unperturbed by the recent upturn in US official interest rates (see Chart 1.10). This suggests that market participants considered the financial position of the main counterparties in the US money markets to be robust, and that they were well prepared for the upturn in the Federal Funds rate, probably reflecting the clear communication strategy of the Federal Reserve.

Another positive development in US money markets over recent months has been a revival of activity in US commercial paper markets. Federal Reserve data show that the outstanding amounts in this market, which had been declining in the period between 2001 and 2003, picked up again recently, reaching the highest

9 Hungary does not participate in ERM II and the central parity and fluctuation margins reported here are unilateral commitments of the Hungarian authorities.

Chart 1.10 US six-month TED spread

(Jan. 1999 - May 2005, basis points)



Source: Bloomberg.

levels observed since June 2001. The apparent return of this market to smoother functioning appears to reflect the overall improvement in corporate sector credit ratings, and should generally support US financial stability.

NON-EURO AREA EU MONEY MARKETS

Within the EU, developments in monetary policy interest rates in non-euro area countries have remained rather diverse. While many countries held official rates unchanged over the past six months (e.g. Sweden and the UK), there were others (e.g. the Czech Republic, Hungary, Poland and Slovakia) where monetary policy rates were lowered, in some cases substantially. The interest rate cuts of the central European countries were at least partially motivated by the strong appreciation pressure of the respective national currencies (see the foreign exchange market section).

US GOVERNMENT BOND MARKETS

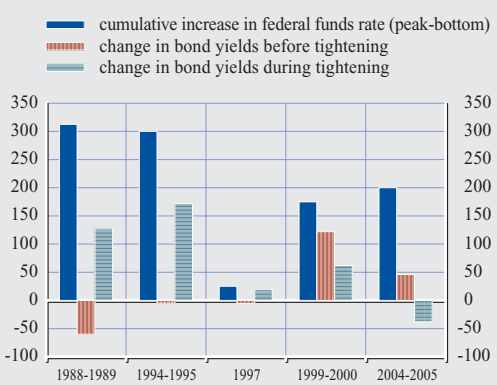
For much of the time after mid-2003, there were concerns about the very low level of long-term yields in US fixed income markets and the potential for a disorderly correction – including the possibility of a spillover to the euro area fixed income markets. As noted in the December 2004 FSR, an unusual feature connected with the upturn of US official rates after June 2004 was the muted reaction of long-term interest rates. Their further decline in early 2005 posed a conundrum, as past episodes of monetary policy tightening have ordinarily involved rising long-term interest rates (see Chart 1.11).

Although US long-term government bond yields oscillated around four-decade lows between November 2004 and mid-February 2005, they temporarily increased thereafter but stood in early May at a low level of 4.2%. The rise in March was mainly due to increasing concerns about inflation against the background of high prices of oil and other commodities, as well as statements made by senior Federal Reserve officials. However, Treasury yields declined again in early April, and bond market volatility remained relatively low.

To some extent, the change in direction of US bond yields witnessed in late February 2005 can be accounted for by changes in the leverage and positioning of non-commercial investors (e.g. hedge funds) in the US Treasury markets (see Chart 1.12 and Box 2). In particular, there were signs that speculative accounts began in late 2004 to unwind the carry trades pointed to in the December 2004 FSR, and that these investors began to position themselves for an upturn in ten-year yields in early 2005.

Chart 1.11 Magnitude of changes in long-term bond yields before and during US monetary policy tightening cycles

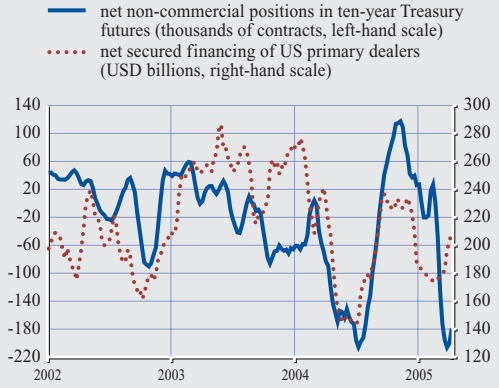
(1987 - May 2005, basis points)



Sources: Reuters and ECB calculations.
Note: Changes prior to the start of a tightening cycle are cumulated over the previous six months.

Chart 1.12 Indicators of positioning and leverage in the US bond markets

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



Sources: Federal Reserve Bank of New York and Bloomberg.

Box 2

HEDGE FUNDS AND THE CROWDING OF TRADES

From an efficiency perspective, hedge funds can have a positive effect on the financial system: they contribute to market liquidity, play an important role in the price discovery process, contribute to the elimination of market inefficiencies, and can enhance investment diversification. However, the proliferation of hedge funds in recent years and their growing importance as participants in global financial markets has raised questions about the possible implications for financial market dynamics and, more generally, stability. As an increasing number of funds attempt to exploit profitable opportunities from similar strategies, concerns have been expressed that the positioning of individual hedge funds is becoming more similar or "crowded". Moreover, the growth of the industry could also be leading to diminishing returns and could as a result push funds into greater risk-taking, through leverage, in order to satisfy the expectations of demanding investors. This Box examines the issue of the risk that crowded trades will result in adverse market dynamics by analysing recent hedge fund return performances from a historical perspective.[1]

When markets are stable, the presence of hedge funds can boost liquidity, whereas under stressed conditions hedge funds – because they are unlikely to or simply cannot afford to wait when leveraged positions begin to lose money – would probably be among the first to "rush for the exit". The crowding of trades or similar positioning across hedge funds within a particular strategy may further magnify the impact of hedge fund exits on certain fledgling or "exotic" markets where the involvement of regulated institutional investors is less prevalent.

Since 2001, hedge fund returns have become less widely dispersed (see Chart B2.1), which could be a broad indication that hedge fund positioning is becoming increasingly similar, although it might also be related to the relatively more benign market environment or to lower risk-taking by hedge funds. One way of disentangling this is to consider patterns in pairwise correlation coefficients of individual hedge fund return performances within strategies. Rising correlations could be a sign that hedge fund managers are employing models that are too similar and are no longer creating true alpha – or excess returns – that are uncorrelated with other managers within the same strategy, even though they may still outperform other types of investments. In the event of a serious market shock, if correlations are high, then hedge funds within a strategy may be more likely to liquidate positions simultaneously, thus amplifying price swings or even causing liquidity to dry up. Higher correlations also imply that diversification possibilities are reduced for funds of hedge funds specialising in a particular strategy.

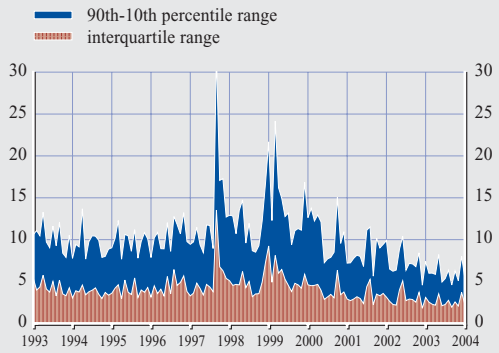
The median pairwise correlation coefficients of hedge fund monthly returns for the 11 years between December 1993 and December 2004 are generally not very high (see the left panel of Chart B2.2),[2] and after taking into account slightly different classifications of strategies, they

1 This Box is based on findings of a forthcoming ECB Occasional Paper on "The Implications of Hedge Funds for Financial Stability" by F. Dierick and T. Garbaravicius.

2 In the TASS database, some time series of hedge fund returns represent merely counterpart onshore and offshore funds or different classes of shares with different fee structures, lock-up periods and other "technical" differences. As a result, such time series basically correspond to the parts of the same pool of money, which are managed in a highly correlated or nearly identical way. Therefore, to ensure conservative results, such time series were aggregated by taking averages of returns weighted by capital under management.

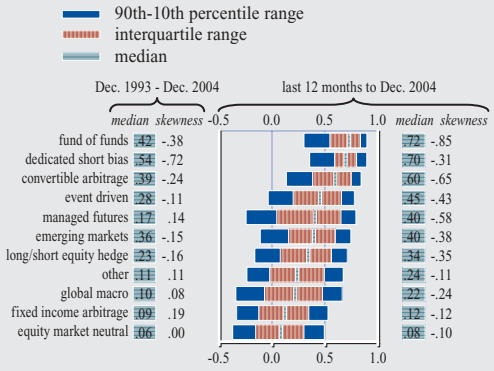
Chart B2.1 Dispersion of hedge fund monthly returns

(%, in USD terms, net of all fees)



Sources: TASS database (24 March 2005 version) and ECB calculations.
Note: Excluding funds of hedge funds.

Chart B2.2 Distribution of pairwise correlation coefficients of monthly hedge fund returns within each strategy



Sources: TASS database (24 March 2005 version) and ECB calculations.
Note: For the last 12 months to Dec. 2004, only hedge funds with 12 observations were included, whereas for the period from Dec. 1993 to Dec. 2004, no less than 12 consecutive overlapping observations were necessary for each pair of hedge funds. Pearson median skewness.

roughly correspond to the values obtained by the Financial Stability Forum (FSF) in 2000 from the MAR/Hedge database for the period from January 1990 to August 1999.[3] According to both calculations, short-sellers and funds of funds were the two categories with the highest medians. However, these results cover rather long periods, while the medians of pairwise correlation coefficients of returns over the 12 months to December 2004 convey a more worrying picture (see the middle and right-hand panels of Chart B2.2).[4] Across all strategies, medians were substantially higher and the distributions of pairwise correlation coefficients were more negatively skewed than their long-term values. For many strategies, the proportions of pairwise correlation coefficients close to or less than zero were substantial, suggesting that in 2004 there were still hedge funds with returns that were uncorrelated to other hedge funds within the same strategy, assuming funds were (self-)classified correctly and that there was no style drift.

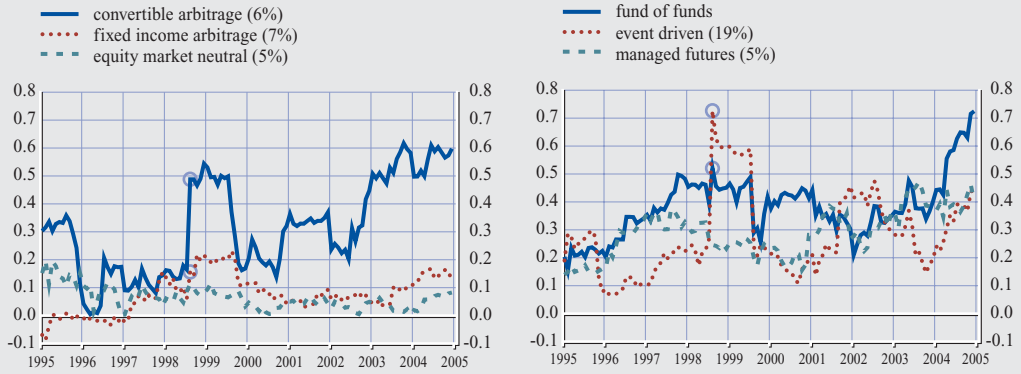
In normal times, owing to a sufficient diversity of micro factors, such as portfolio structure, liquidity profile, internal risk limits or timing, similar actions by hedge funds may lead to varied performances, even if hedge fund investment strategies, positions and expectations within strategies might be very alike. However, under stressed conditions, these differences tend to disappear, especially if trades are leveraged, and the ability of hedge funds to take offsetting contrarian positions is limited.

In times of stress, if trades are crowded, the correlations of return performances can surge. This occurred in August and September 1998 after the Russian default and the near-collapse of LTCM (see Chart B2.3). Putting the recent rise of correlations into this historical context, the behaviour of median pairwise correlation coefficients within fund of funds, event driven,

3 See FSF (2000), "Report of the Working Group on Highly Leveraged Institutions", April, p. 89 and p. 104.
4 Given 12 observation pairs and a 5% (1%) confidence level, statistically significant (i.e. different from zero) module values of pairwise correlation coefficients should exceed 0.58 (0.71).

Chart B2.3 Medians of pairwise correlation coefficients of monthly hedge fund returns within strategies

(moving 12-month window)



Sources: TASS database (24 March 2005 version), TASS Research and ECB calculations.
Note: Circled points refer to August 1998. Numbers in the parentheses after strategy names indicate the share of total capital under management (excluding funds of hedge funds) at end-December 2004, as reported by TASS Research.

convertible arbitrage and managed futures strategies in a relatively benign market environment raises concerns. The medians of convertible arbitrage, fixed income arbitrage, event driven and managed futures strategies have also exhibited long-term rising trends.

All in all, there are indications that hedge fund positioning has resulted in a crowding of trades in some markets, possibly leaving them vulnerable to adverse market dynamics. These concerns are the largest for convertible arbitrage and fixed income arbitrage strategies, calling for close monitoring, especially as these strategies generally have the highest leverage and therefore significant gross positions. The unwinding of these positions could prove disruptive for the fixed income markets in which these funds are involved, especially if the degree of liquidity in these markets was to prove low.

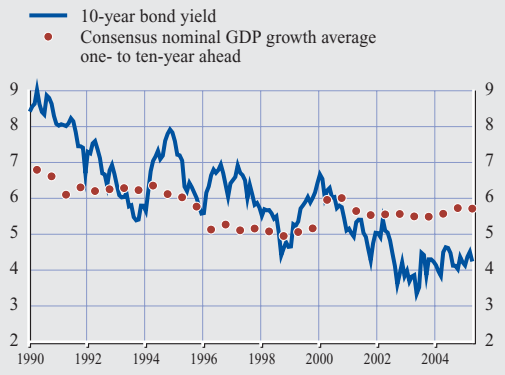
Given the decline in US long-term yields in April, risks of an upturn appear to remain. In the medium to long term, a close link between the level of the ten-year nominal bond yields and consensus expectations of nominal GDP growth over the following ten years might be expected. The gap between the level of ten-year nominal bond yields and consensus expectations of nominal GDP growth over the following ten years was still high in early 2005. This suggests that further increases in yields cannot be excluded (see Chart 1.13). This outlook is consistent with recent investor surveys. For example, the Global Fund Manager Survey published by Merrill Lynch[10] in March showed that the net percentage of bond and equity fund managers who believed that bonds were overvalued remained high (55% and 73% respectively in March 2005).

Persistently low US long-term bond yields appear to have been somewhat demand-driven. Government bond demand by foreign official investors, most likely (Asian) central banks, has remained relatively strong over the last six months. In 2003 and 2004 combined, foreign official and institutional investors invested almost USD 500 billion in US Treasury and agency bonds. While the extent of their

10 See Merrill Lynch (2005), "A High-conviction Cyclical Strategy Resting on Low-conviction Growth Prospects", 15 March.

Chart 1.13 US ten-year bond yield and consensus ten-year nominal GDP growth expectations

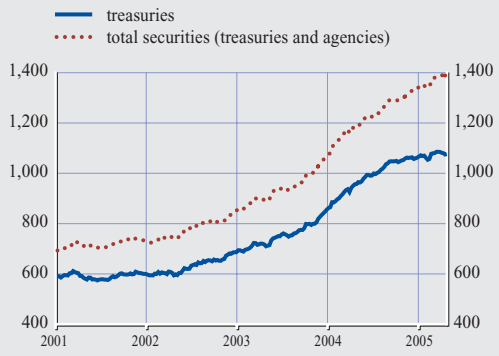
(Jan. 1990 - Apr. 2005, %)



Sources: ECB and Consensus Economics.

Chart 1.14 Holdings of US Treasury and agency securities by foreign official and institutional investors

(Jan. 2001 - Apr. 2005, USD billions)



Source: Bloomberg.

accumulation of US Treasury securities appeared to be slowing down after late 2004 (see Chart 1.14)[11], which might have been an additional factor in contributing to the recent rise in yields, the overall importance of these investors for the US fixed income markets probably remains high, as recent remarks made by senior Federal Reserve officials seem to confirm.

It cannot be excluded that the demand for US bonds may also have been supported by the so-called recycling of petrodollars. This involves oil exporting countries investing their USD-denominated revenues, which have ballooned in line with rising oil prices, into the US fixed income markets.

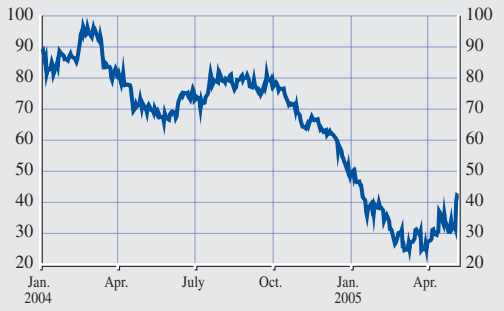
Another factor holding US long-term yields down is suggested by patterns of yield curve movements over the past six months. In particular, the US yield curve continued to flatten across all maturities throughout the whole six month period since the last FSR. While a narrowing of term spreads at the short end is to be expected as monetary policy is tightened, a flattening at longer maturities of the yield curve is notable. In particular, a pronounced narrowing of the ten-year/30-year term spread took place after November 2004 (see Chart 1.15). To some extent, this appears to have reflected anticipation of increased institutional investor demand against a background of discussions on pension reform in the US, which, if implemented, would increase the demand for long-term assets. In this vein, short-term investors, such as hedge funds, have reportedly been among the buyers of long-dated bonds. On the other hand, it appears that demand among US retail investors for bonds has remained modest, as mutual fund inflow patterns indicate (see Chart S17). The recent announcement by the US Treasury that it may resume the sales of the longest-maturity securities that it had discontinued more than three years ago led to a reversal of the narrowing of the ten year/30year term spread.

Looking ahead, a crucial issue from a financial stability perspective seems to be whether demands for US government bonds will remain strong, especially from (Asian) official accounts. If this demand were to fade, it would probably put further upward pressure on US government bond yields, with attendant risks for the global financial markets.

11 The chart only displays holdings of US Treasury and agency bonds. It is however reasonable to assume that these official accounts also increased their holdings of USD-denominated deposits.

Chart 1.15 Spread of 30-year over ten-year US Treasury yields

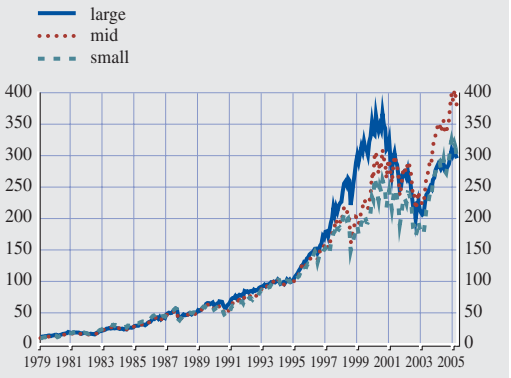
(Jan. 2004 - May 2005, basis points)



Source: Bloomberg.

Chart 1.16 Small, mid and large caps: total return index in the US

(Jan. 1979 - Apr. 2005, index Dec. 1993 = 100)



Source: Wilshire.

US EQUITY MARKETS

After some increase towards the end of 2004, US stock prices, on aggregate, remained essentially range-bound in early 2005 (see Chart S13). Among the supporting factors, the stock market was favoured by a slight pick-up in the weight of mutual fund inflows, as mutual funds hold around one-quarter of US corporate equities (see Chart S17), as well as by further declines in market participants' expectations of future volatility (see Chart S16), and by strong corporate earnings growth. In addition, there was a further rise in the funding of equity positions through borrowing (see Chart S18). On the other hand, rising long-term interest rates in February/March 2005 and a continued decline in expected earnings per share (EPS) growth for the next 12 months, together with high oil prices, worked in the opposite direction. Against this background, the price-earnings (P/E) ratio for the US stock market, based on ten-year trailing earnings, remained high in early 2005 (see Chart S14).

There were, however, remarkable differences in the performances of different segments of the equity markets. The prices of small and mid-cap stocks reached all-time highs, whereas the large cap stock index remained below its early 2001 peak (see Chart 1.16).

Looking ahead, downside risks for the US equity markets include indications that the US corporate earnings cycle may have peaked, that risk-free interest rates have started to rise and that P/E ratios have remained comparatively high, particularly in the small and mid-cap segments of the market. Moreover, indications of increased borrowing to buy stocks "on margin" – an arrangement that allows investors to use loans to pay for up to 50% of a stock's price – suggests that relatively cheap and abundant sources of liquidity may have encouraged investors to increase their exposures to equity markets (see Chart S18). Although this yardstick of leverage in US equity markets remained well below the heights reached in early 2000, the vulnerability of US share prices to adverse market dynamics arising from margin calls – a repayment demand triggered by sliding share prices – may have increased since late 2004. Nevertheless, valuation indicators based on option prices do not suggest that in early 2005 market participants were concerned about the likelihood of either imminent large stock price declines or increases. Furthermore, stock market implied volatility remained low, suggesting that market participants do not foresee large stock price changes in the coming months (see Chart S15). It cannot, however, be ruled out that the potential risk of a further rise

in long-term interest rates, coupled with widening corporate bond spreads, might result in higher stock market volatility.

Signs of improved financing conditions in equity markets were evident throughout 2004. It became easier for US firms to tap secondary public offering (SPO) markets for fresh equity, allowing them to improve their debt-equity ratios. In addition, activity in initial public offerings (IPOs) improved throughout the year (see Chart S20).

US CORPORATE BOND MARKETS

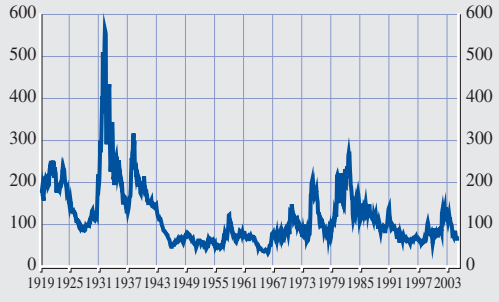
US corporate bond spreads, which were already narrow, declined further after November 2004 towards levels that have been observed only infrequently over the past 80 or so years (see Chart 1.17). The tightness of these spreads can be explained by strong corporate profit growth, ongoing corporate balance sheet repair, historically low default rates and very low stock market volatility. However, an ongoing and aggressive hunt for yield in an environment of very low yields on risk-free instruments, together with generally ample liquidity conditions in the economy, may have played a complementary and amplifying role.

Overall, even though many factors seem to have supported the tightness of US credit spreads, it cannot be excluded that valuations will be tested in the period ahead. For instance, a somewhat puzzling feature has been the resilience of credit spreads to the marked flattening of the US yield curve after US official interest rates began to rise. In addition, issuance at the lower end of the speculative-grade credit quality spectrum – Caa-C rated issuance in 2004 was the highest on record – could push spreads wider.

Looking ahead, there also appears to be a risk that a "credit event" could prompt a reversal in US credit markets, possibly triggering a widening of corporate bond spreads, especially at the lowest ends of the credit quality spectrum. While the risk of emerging financial distress has been widely known in credit markets for some time, automobile manufacturers surprised the markets with profit warnings in mid-March and mid-April, as the announcements raised the probability of a downgrading of their debt rating to sub-investment grade – often known as junk quality – in the period ahead. In fact two large US automobile manufacturers, Ford and General Motors, were downgraded to speculative grade by Standard and Poor's in early May. Given the large amounts of corporate bonds issued by these companies, these downgrades have the potential to disrupt the market, not only through forced-selling – many institutional investors are restricted from holding speculative grade bonds in their portfolios – but also through general contagion in the

Chart 1.17 US BAA – AAA corporate bond spread

(Jan. 1919 - Apr. 2005, basis points)



Source: Moody's.

Chart 1.18 Spread of corporate bonds issued by US industrial companies

(Jan. 2004 - May 2005, basis points)

Source: Merrill Lynch.

corporate bond market, as bonds issued by these companies have a high weighting in many bond indices. As a result, the spread of the Merrill Lynch index of corporate bonds issued by US industrials, which includes a significant share of bonds issued by General Motors and Ford, widened significantly after mid-March, reaching the highest levels seen in over 15 months (see Chart 1.18). This widening had some spillover effects to other sectors and countries.

COMMODITY MARKETS

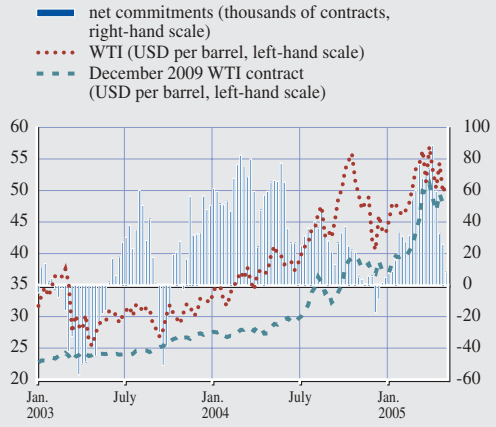
For financial stability, risks in commodity markets, especially in oil markets, tend to operate largely through indirect, or macroeconomic, channels. Furthermore, if high commodity price levels were to persist, this could affect financial variables such as equity returns and equity risk premia.[12] However, there have been indications that speculative activity in these markets has been rising over recent years, so that the importance of direct channels may be rising commensurately.

Following what proved to be a temporary correction at the end of 2004, crude oil prices recovered and reached a new all-time high in early April 2005 (see Chart 1.19). Given that the EUR/USD rate remained broadly stable over this period, the increase in oil prices was not softened in euro terms. One of the main short-term factors lying behind this surge was exceptionally cold weather on both sides of the Atlantic. However, there are also some indications that the latest surge in oil prices has coincided with heightened speculative activity in oil derivatives markets, notably by hedge funds in their search for yield. In particular, speculative long positions in the oil market, which were unwound in late 2004, reached new heights in early 2005 (see Chart 1.19).

While there are indications that the involvement of speculative accounts in the oil market increased in early 2005, their share in overall positioning did not however reach the highs seen over the past two years (see Chart S24).

Chart 1.19 Speculative positions and WTI crude oil spot and futures prices

(Jan. 2003 - May 2005)



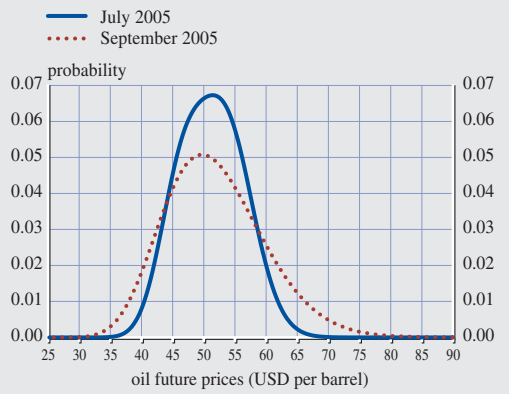
Source: Bloomberg.
Note: "Net commitment" is the net futures commitments of non-commercials which equals the number of long–short contracts. "Non-commercial" denotes entities not engaged in crude oil production or refining.

With respect to the fundamental long-term factors driving oil prices, it appears that global demand has been playing an important role as indicated in projections of the International Energy Agency (IEA). In particular, projections for oil consumption from the US as well as from China – now the second largest oil consumer in the world – have been rising. The IEA, however, also increased its supply forecast from non-OPEC countries, and OPEC is expected to further increase its production capacities. Owing to buoyant demand growth, this increase will however have no significant impact on spare production capacities, leaving the overall oil market vulnerable to potential supply disruptions. This will probably continue to support high price volatility in oil markets, and has caused some analysts, including the IMF[13], to no longer exclude the possibility that oil prices could temporarily spike at levels of around 100 USD per barrel. However, the distributions of future oil prices implied in options prices on oil indicate that market

12 See also Sub-section 3.2.

13 See the transcript of the IMF Press Conference held on 13 April 2005 on the occasion of the presentation of the most recent World Economic Outlook, which can be found at http://www.imf.org/external/np/tr/2005/tr050413.htm

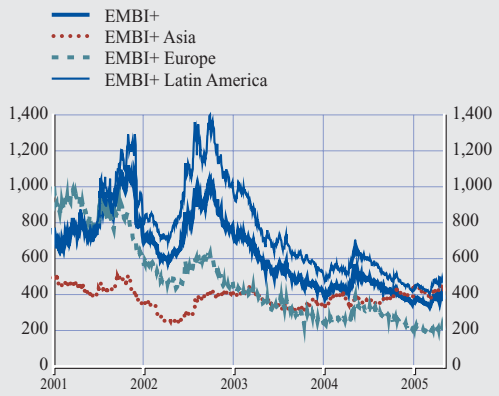
Chart 1.20 Implied risk-neutral density for oil futures prices



Sources: Bloomberg and ECB calculations.

Chart 1.21 Sovereign bond spreads in major emerging regions

(Jan. 2001 - May 2005, basis points)



Source: JP Morgan Chase & Co.

participants consider this as a very low probability outcome (see Chart 1.20).

As oil supply is relatively inelastic in the short run, and as an investment deficit exists in the oil industry, both in exploration and in refining capacities, futures market participants have been pricing in the expectation that oil prices could remain high for some time.

Turning to the other commodity markets, in US dollar terms, gold and other precious metals prices approached record highs in late 2004 (see Chart S23). It should be noted that these price developments to some extent reflect market concerns about the longer-term implications, including inflation, of apparently abundant liquidity in global capital markets. A further factor that appears to have underpinned the upturn in precious metals prices is thought to be speculative activity in these markets undertaken by hedge funds. Other metal prices – especially aluminium, copper and zinc – also reached historic peaks in early 2005, to some extent reflecting higher demand from growing economies, in particular from China.

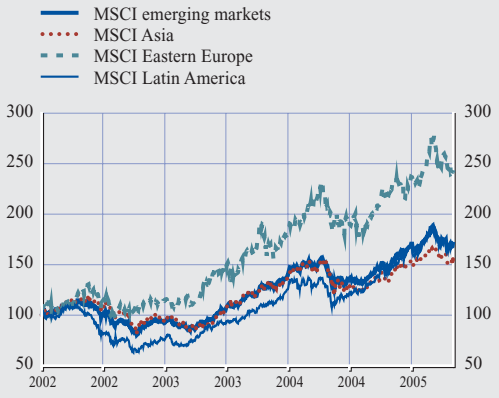
EMERGING MARKET FINANCING CONDITIONS

Financing conditions in EMEs remained favourable into 2005, supported by accommodative global liquidity conditions, the hunt for yield, and a broadened international investor base. Compared with the lows of end-2004, sovereign bond spreads in major emerging regions had changed little by early May 2005 with a modest correction of only 20-30 basis points in most cases as of mid-March (see Chart 1.21).

Emerging equity markets, which saw notable gains after early 2003, strengthened further after late 2004, especially in emerging Europe (see Chart 1.22). Purchases by foreign investors provided significant impetus to some of these markets.

Chart 1.22 Equity market indices in major emerging regions

(Jan. 2002 - May 2005, index: Jan. 2002 = 100)



Source: Morgan Stanley Capital.

Emerging market borrowers took advantage of the favourable environment and ready access to external finance by locking in issuances at favourable rates and (in the case of sovereigns) engaging in active debt management. In this context, major EME borrowers anticipated the bulk of external financing requirements for 2005, and in some cases (such as Mexico), the financing needs of 2006 are expected to be completed by the first half of 2005. Some EMEs are also pressing ahead with plans to use all or part of the issuance proceeds to retire more costly obligations from the market (notably Brady bonds). Conspicuously, there was also a return of sovereign issuances, denominated in euro, after lengthy absences by some borrowers (e.g. Brazil and Venezuela) and the gradual emergence of international bond issuances in domestic currency by both corporate and sovereign issuers, a trend led by Latin American economies. In all, international bond issuance by major EMEs increased 12% year on year on average in 2004, with Mexico, South Korea and Russia dominating issuance trends in their respective regions. Data for the year to May 2005 suggest that this strong pace of issuance activity was broadly maintained across emerging markets (see Table S2).

Although the emerging market financing outlook for the remainder of 2005 seems benign, EMEs are likely to remain vulnerable to several risks associated with very tight spreads. At about 380 basis points for the overall benchmark EMBI+ index, emerging market spreads remained in early May 2005 around 350 basis points below their 11-year and post-Asian crisis historical averages respectively, and very close to levels posted in the run-up to the 1997-98 Asian financial crises (see Chart S22).

A number of recent empirical studies have pointed to the prominent role of mature economy factors – notably low interest rates – in accounting for the very low level of EME bond spreads. According to one of these studies, global liquidity and declining risk aversion explain a significant proportion of the narrowing of emerging market spreads between October 2002 and December 2003, with the impact of ample global liquidity exceeding that of any other explanatory variable during the period.[14] Similarly, there are estimates that suggest that two-thirds of the compression in EME bond spreads in the period between October 2002 and early 2004 could be explained by so-called push factors alone, especially the fall in US short-term rates in 2001.[15] Another study provides more balanced results, showing that about 40% of the narrowing in spreads after Q4 2002 could be explained by better domestic fundamentals, 17% by stronger export prices and global growth, 20% by greater availability of global liquidity, and the remaining 23% by lower risk aversion.[16]

Based on these studies, emerging market vulnerability to an upward correction in bond spreads would appear to stem from two factors. First, doubts as to whether some EME credits may be misaligned relative to underlying fundamentals could potentially test EME bond markets. Assuming unchanged global liquidity conditions, this would amount to a shift in the underlying perception of risk by investors owing to specific factors (e.g. unrealised optimistic growth expectations, policy reform slippages, or a deterioration in the external environment involving a drop in commodities prices). Against this, concerns about potential mispricing in emerging bond markets were partly dispelled by the fact that fundamentals continued to improve after late 2004, while financial vulnerabilities have been reduced and structural (notably fiscal) weaknesses have been addressed in certain cases, as confirmed by sovereign ratings upgrades.

14 See IMF (2004), "Determinants of the Rally in Emerging Market Debt – Liquidity and Fundamentals", Global Financial Stability Report, April.

15 See G. Ferruci, V. Herzberg, F. Soussa and A. Taylor (2004), "Understanding Capital Flows to Emerging Market Economies", Financial Stability Review, Bank of England, June.

16 See Goldman Sachs (2005), "Unpleasant EDM Arithmetic", Global Markets Viewpoint, 1 March.

Second, an upturn in global interest rates – primarily associated with a rise in mature economy long-term government bond yields – may also induce a widening of EME bond spreads, due to a change in investors' relative preferences. Although the impact of this potential upward correction is likely to have different effects across countries, it would probably affect the entire asset class across (as opposed to within) emerging markets.

All in all, the ability of EMEs to withstand financial turbulence has been enhanced both by the structural reforms undertaken in the years since the Asian crises and by the strong external positions that characterise most economies at present.

1.3 CONDITIONS OF NON-EURO AREA FINANCIAL INSTITUTIONS

GLOBAL BANKS

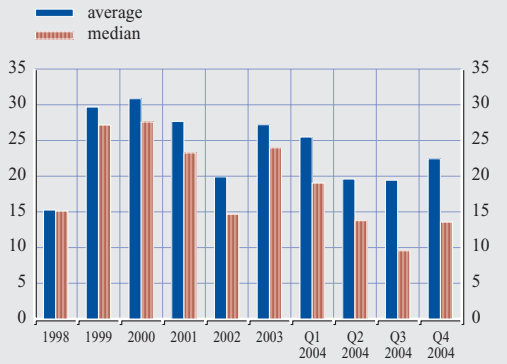
As discussed in the December 2004 FSR, the conditions of large global financial institutions, not all of which are banks (see Box 3), can be important for euro area financial stability because of their central role in market-making activity, particularly in some comparatively new financial markets[17], as well as because of their importance as counterparties. If problems were to emerge in one of these institutions, they could lead to knock-on effects for euro area financial institutions with counterparty relationships.

Consolidating the improvements in profitability reported for the first half of 2004, the financial results for global financial institutions for the full year 2004 were generally characterised by healthy developments in terms of profitability, costs and risks. For most institutions, profitability growth was broadly based across activities, with costs being contained relatively successfully. The profitability of several institutions was supported by strong performances from diversified operations such as investment banking operations (including mergers and acquisitions (M&A)), asset management and prime brokerage. Finally, trading income as a share of total income tended to be more important for some of these institutions.

Although most institutions derived substantial revenues from trading activities in the first quarter of 2004, income from this source tended to decline over the next two quarters before picking up again before the end of 2004 (see Chart 1.23). This was caused by declining volatility in fixed income and equities markets. The backdrop of a flattening US yield curve, rising commodity prices, and increasing stock market valuations in emerging markets all contributed to profitability.

Chart 1.23 Trading revenues as a proportion of total net revenues

(1998 - 2004, %)

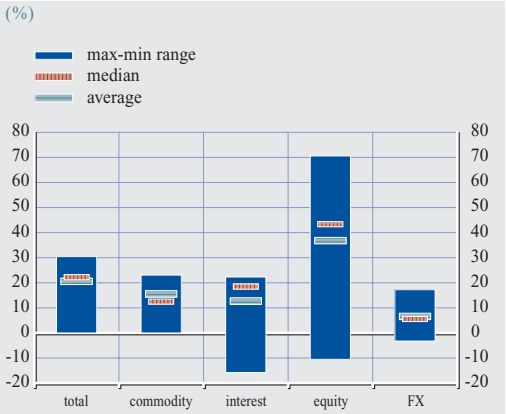


Sources: SEC filings and ECB calculations based on earnings reports.
Note: The institutions included are Goldman Sachs, Lehman Brothers, JPM Chase, Morgan Stanley, Merrill Lynch, Citigroup, UBS and CSFB.

There are indications that many of these institutions increased their market risk-taking in 2004 as they raised their trading limits. This was reflected in rising trading portfolio VaR levels (the actual money amount of exposures) of all of these institutions compared with 2003

17 For example, Fitch Ratings reports that ten institutions account for about 69% of the total counterparty exposures in the credit derivatives market. See Fitch Research (2004), "Global Credit Derivatives Survey – Single-name CDS Fuel Growth".

Chart 1.24 Changes in Value at Risk (VaR) levels between 2003 and 2004



Sources: Individual institutions' public disclosures in financial statements and ECB calculations.
Note: The VaR measures refer to trading portfolios where available.

(see Chart 1.24). Much of the rise took place in the first quarter and receded during the remainder of the year.[18] For the full years, between 2003 and 2004 the median level of increase of the VaR levels of these institutions was 22%, with an average increase of about 20%. Equities saw the largest percentage increase in VaR, followed by interest rates and commodities. At the same time, interest rate risk, which tends to be the largest of all market exposures, declined. This may suggest some of these institutions were preparing themselves for an upturn in bond yields. Notwithstanding overall increases, the amounts at risk, due to the possibility of adverse market movements, remained small compared to capital.

Looking ahead, the outlook for these institutions remains favourable. Some preliminary financial results for the first quarter of 2005 suggest that steady growth in profitability is set to continue. Against this background, the rating outlook from the major agencies for these institutions is favourable.

Some latent risks do, however, remain, of which three main ones can be identified. First, substantial revenue growth due to buoyancy in fixed income markets over the past two years is unlikely to be repeated to the same extent in 2005. Second, the possibility that large trading losses could cause problems for any one of these institutions, while very remote, cannot be ruled out by virtue of the scale of proprietary trading that some of these institutions are engaged in. Third, while diversification into other activities such as prime brokerage may produce less volatile earnings compared with trading activities, it may incur additional, and less visible, counterparty or operational risks.

18 Measured this way, the most important type of outstanding exposure was to interest rates, followed by equities and then foreign exchange. However, as each of these institutions uses differing inputs and adopts different methods for calculating VaR figures, there is limited merit in comparing actual VaR levels across institutions. Information on individual changes in VaR levels may nevertheless provide a broad indication of market-related risks taken on by these institutions.

Box 3

US GOVERNMENT-SPONSORED ENTERPRISES AND SYSTEMIC RISK

In recent months, reputational and accounting problems at two US government-sponsored enterprises (GSEs), the Federal National Mortgage Association (FNMA, or "Fannie Mae") and the Federal Home Loan Mortgage Corporation (FHLMC, or "Freddie Mac") have lent renewed impetus to the ongoing debate concerning the status of US GSEs and the risks that they pose. The two GSEs are privately owned corporations chartered by the federal government to achieve a public financial purpose. They have a line of credit to the Treasury; they are exempt from state and local taxes, which increases their profit margins; and no Securities and Exchange Commission (SEC) registration of their debt or mortgage-backed-securities (MBS) is

required.[1] In addition, national and state-chartered banks may deal in, underwrite, purchase and hold GSE securities without any limits. As the bonds issued by GSEs offer a small yield spread over US Treasuries, and since they have a favourable capital risk-weighting, many banks may have significant exposures to their debt. GSE debt securities are not backed by "the full faith and credit" of the US government, but given their line of credit, mission and size, most market participants view their securities as having an implicit government guarantee. The US Congress originally created Fannie Mae and Freddie Mac to increase the supply of mortgage credit. They do this essentially by purchasing mortgages from mortgage lenders, which frees up lenders' capital to extend new mortgage loans. They then hold these mortgages as investments, or package them into MBS and resell them on the market. Thus, in increasing the supply of mortgage credit, the GSEs have also developed a secondary market for MBS. A large portion of their outstanding debt is short term: about 50% at Fannie Mae, and about 30% at Freddie Mac. In addition, their benchmark and reference securities include long-term bullet-subordinated and euro-denominated long-term debt as well as callable securities.[2] The two GSEs combined either guarantee or own half of all residential mortgages in the US.

Many observers claim however that the two agencies have grown too large, partly as a result of their relatively low funding costs. The mixture of implicit state guarantees as perceived by the market and private ownership is seen as giving rise to risks of moral hazard, perhaps leading to excessive risk-taking. At the same time, these agencies are generally perceived as being too large to fail. According to a report published by the Office of Federal Housing Enterprise Oversight (OFHEO) – the supervisor of Fannie Mae and Freddie Mac – the two are among the largest financial institutions in the world and are systemically important for several reasons.[3] Chief among these from a global financial stability perspective is the fact that the two are major players in the OTC financial derivatives market, where they are often favoured counterparties, given their perceived implicit federal guarantees. The market for OTC interest rate derivatives is highly concentrated among a small number of dealers, primarily brokerage firms and commercial banks, which are counterparties for at least one side of virtually all of the contracts of the GSEs. Many of these counterparties are themselves systemically important institutions, so that a failure at either agency could quickly spread through the global financial system, affecting institutions in the euro area as well. In addition, a serious disturbance on the secondary market for agency debt instruments – the trigger for which could be the loss of their implicit guarantee or rating actions against them – could soon disrupt the origination of mortgage loans in the US. Moreover, as agency debt instruments are extensively used as collateral for liquidity management purposes and held in foreign reserve portfolios by a number of central banks, an upheaval could have direct effects worldwide. This could also adversely impact the market value of euro area banks holdings of their bonds, which can be sizeable.

Some have suggested that the GSEs lack adequate capital levels to weather possible disruption in the capital markets.[4] Others have pointed to the fact that if the GSEs were purely private, i.e.

1 This means that they are not required to file quarterly and annual reports, although listing on the New York Stock Exchange (NYSE) requires them to publish such reports.
2 Debt financing strategies typically function so that debt issuance is used to fund mortgage purchases. Since the late 1990s, GSEs have tried to capture a liquidity premium by replicating many aspects of the Treasury Department's auction schedule (e.g. minimum issuance, issuance calendars, issuance of benchmark securities, etc.).
3 See OFHEO (2003), "Systemic Risk: Fannie Mae, Freddie Mac and the Role of OFHEO", February.
4 See, among others, W. Poole (2002), "Financial Stability", speech presented by the President of the Federal Reserve Bank of St. Louis at The Council of State Governments Southern Legislative Conference Annual Meeting New Orleans, Louisiana, 5 August 2002, published in Economic Review, Federal Reserve Bank of St. Louis, Vol. 84, No 5 (September/October 2002).

if their returns on equity and their returns on assets were similar to those of other large financial institutions, they would hold far fewer of their MBS in their own portfolios, and their capital-to-asset ratios would be higher.[5] For these reasons, and primarily owing to the systemic importance of these institutions, the US Treasury has been pushing for reform with the aim of strengthening regulatory oversight.

In June 2003, Freddie Mac removed its top three executives (the institution's Chief Executive, Financial and Operating Officers) who had restated financial results since 2000, owing to errors in the calculation of financial derivatives positions. They were also accused of not cooperating fully with the Board's audit committee. In March 2004, Fannie Mae acknowledged derivatives losses of USD 5.3 billion in unrealised losses for open hedges and USD 6.9 billion in realised losses for closed hedges due to falling interest rates. It also seems that Fannie Mae could be forced to recognise a further USD 2.8 billion in additional losses on its derivatives portfolio because of new accounting concerns recently raised by OFHEO, bringing the amount of restated losses to almost USD 12 billion. Such losses were reported on Fannie Mae's balance sheet but not in its earnings or regulatory capital calculations, thanks to the hedge accounting technique.[6] In recent months, the company has already halved its dividend, raised capital by issuing USD 5 billion in preferred stock, and started to reduce its holdings of mortgages and MBS.

In September 2004, OFHEO issued a report on Fannie Mae's accounting policies. The report deemed the company's capital to be below its statutory minimum requirement, and raised serious concerns about the quality and accuracy of the published financial results, the quality of management supervision and "the overall safety and soundness of the Enterprise".[7] In criticising Fannie Mae's internal controls, OFHEO pointed out that "the failure by management to properly implement critical accounting policies is due in part to the lack of a sound framework for developing these policies." The report indicated that "dysfunctional and ineffective" accounting policies and internal controls may have been misused to boost the top executives' bonuses, and executives may have misled the regulator about this. Meanwhile, the SEC has announced its own informal inquiry into the allegations put forward by OFHEO. Similarly, the US Justice Department has opened an investigation into fraud at Fannie Mae.

With regard to the three major rating agencies, Fitch Ratings, Moody's and Standard & Poor's affirmed the AAA senior debt ratings of the two GSEs. Rating agencies did, however, place their financial strength rating and their preferred stock and subordinated debt under review for possible downgrade, in 2003 for Freddie Mac and in 2004 for Fannie Mae. In the absence of any material disclosures, ratings were confirmed for the former, with Moody's saying that it highly regarded the institution's risk management capabilities, and believed that the GSE retained strong creditworthiness, with highly sophisticated risk management capabilities and systems in place, and a conservative management philosophy towards risk. Regarding Fannie Mae, at the end of March 2005 Moody's downgraded its financial strength rating from A- to B+ with a stable outlook following the company's announcement of several additional accounting and internal control issues identified by OFHEO.

5 See W. Passmore (2003), "The GSE Implicit Subsidy and Value of Government Ambiguity", available at http://www.federalreserve.gov/pubs/feds/2003/200364/200364pap.pdf

6 Under so-called hedge accounting, in certain instances and for certain companies, a loss in derivatives contracts that are closed out before maturity can be designated as losses derived from hedges and can then be amortised over a period of time, instead of all at once.

7 Following the publication of this report, Fannie Mae and OFHEO reached an agreement requiring Fannie Mae to take several corrective actions, and to respect a capital surplus requirement equal to 30% of the minimum capital requirement.

The view of rating agencies has so far been balanced and cautious, weighing on the fact that there have been no substantial changes regarding the GSEs' implicit guarantees; indeed, the negative publicity may amount in the worst case to a downgrade from triple A to double A. For example, Fitch Ratings stated that while the triple A senior debt rating of these GSEs is not untouchable, it would take a combination of events that demonstrated that the government's relationship with the GSEs has been weakened or severed for the GSEs to be downgraded. On the other hand, rating agencies would respond favourably to legislation that creates a strong regulatory framework, as this would reinforce the safety and soundness of the enterprises.

JAPANESE BANKS

There has been an overall improvement in the health of the Japanese banking sector in recent years, reflecting upgraded supervision and a positive operating profit in fiscal year 2003 for the first time since 1993. This has been recognised by the rating agencies, which upgraded eight banks during the third and fourth quarters of 2004, and did not downgrade any of them.[19] Despite the complexity of such a large deal, the merger between the second (MTFG) and the fourth (UFJ) largest banks in Japan, scheduled for October 2005, might signal a return of confidence in the banking industry. With combined assets of about USD 1.8 trillion, the new merged bank will be the largest bank in the world.

More recently, Japanese banks have been confronted with domestically weak economic activity. Nevertheless, business fixed investment has strengthened, corporate profitability has improved, and the number of corporate bankruptcies has declined. This might explain declines in non-performing loans (NPLs), which in September 2004 ended up just above 5%, down from 8.4% in 2002 (see Chart S6). The decline may also reflect actions taken by banks to meet the target by the Japanese Financial Services Agency to halve NPL ratios from their peaks by March 2005.

Information on banks' core business, the supply of credits, has provided mixed signals. On the one hand, the lending attitude of private banks has become more accommodative on the whole, which is supported by an improved lending attitude of financial institutions as perceived by firms. By contrast, lending growth by private banks has remained negative.

The direct links between euro area and Japanese banks are relatively minor. On average, Japan's share in the total foreign claims of euro area banks decreased during 2004, down from 5.0% in the first quarter to 4.2% in the third quarter. The declining share reflects both a decrease in absolute claims on Japan and an increase in total foreign claims of euro area banks. However, there are substantial differences between individual euro area countries in their bank exposures to Japan, ranging from 9.4% (France) to as low as 0.2% (Finland and Spain).

CONDITIONS IN NON-EURO AREA EU BANKING SECTORS

A common pattern across all non-euro area EU countries was the very strong performance of banking sectors in 2004. While interest income remained the most important source of income, non-interest income became increasingly important. At the same time, loan loss provisioning fell across the board on account of improved macroeconomic conditions and because of expectations that credit risks would remain low.

In the UK, bank profitability strengthened owing to increased income, while cost-to-income ratios generally fell as income rose faster than expenses for most banks. Growth in

19 The rating actions were taken by Standard and Poor's.

lending volumes continued, although there was some differentiation across industry sectors, while lending to households, mostly for housing purposes, remained robust. Although there was no clear liquidity trend, all banks reported an increase in the proportion of liquid assets in the form of debt securities. Capital adequacy remained stable.

In Sweden, too, banks reported high profitability; in 2004 the return on equity (ROE) stood at around 15%, versus 12% in 2003, driven by non-interest income, mostly net commission income. The liquidity of banks did not change after end-2003, and capital adequacy ratios remained satisfactory (10.1% overall solvency ratios).

In Denmark, profitability increased strongly owing to a substantial decrease in loan loss provisioning, while staff and administrative costs increased. Liquidity fell in 2004, but from the very high levels reached in 2003. Lending to households for house purchase has become an increasingly important income source, and the associated credit risk is considered to be low. The direct exposure of banks to the commercial property market has on the other hand remained small, given that this market is dominated by mortgage companies.

Concerning the Baltic countries, the profitability of banking sectors also improved in all three economies: annual figures for 2004 for ROE stood at 21.4%, 13.0% and 23.0% for Latvia, Lithuania and Estonia respectively. In Latvia, the increase was driven by credit expansion, growing amounts of payment cards, increases in banks' client base, and the development of remote banking. In Lithuania, strong rises in borrowing and non-interest income, coupled with expansion of remote banking and a reduction in fixed costs (layoffs and increased outsourcing), contributed to increased profits. In Estonia, the rise was driven by both interest and non-interest income, and improved efficiency. Liquidity improved in Latvia owing to a rise in claims on foreign credit institutions and on the Bank of Latvia, while it remained broadly unchanged in Lithuania and Estonia, although in the latter the share of highly liquid instruments in banks' total assets increased. Capital adequacy ratios slightly fell in this group of countries, while remaining at comfortable levels (with overall solvency ratios of 11.5% in Estonia, 12.3% in Lithuania and 11.7% in Latvia).

Regarding the central and eastern European countries, profitability increased in all countries: ROE stood, at end-2004, at 23.5%, 13.3%, 25.5%, 16.8% and 16.5% in the Czech Republic, Slovenia, Hungary, Poland and Slovakia respectively. Liquidity increased in Slovenia owing to increased borrowing from foreign banks and regulatory changes; rose only moderately in Hungary thanks to the slowdown in household lending growth; increased in the Czech Republic due to an increase in deposits; remained broadly constant in Poland; and fell in Slovakia owing to a rise in short-term capital flows, attracted by expectations that the domestic currency would appreciate. Capital adequacy ratios fell in the Czech Republic, Slovenia, Hungary and Slovakia. Nonetheless, banks met regulatory capital requirements (overall solvency ratios of 12.7% in the Czech Republic, 11.0% in Slovenia, 11.2% in Hungary, 19.0% in Slovakia and 15.6% in Poland). The banking sectors in Slovenia and Slovakia were characterised by cost control or cost containment, measured by the cost-to-income ratio. Finally, provisioning increased in the Czech Republic and Hungary, but declined in Slovakia and Poland.

In Malta, banks' net interest income declined owing to a marked increase in interest expenses (+11% year on year), as reported by banks which mainly trade with non-residents and in foreign currency. At the same time, non-interest income increased by 115%, with part of the increase being due to a reclassification in interest income. ROE increased to 13.8% (up from 11.1% in 2003), and capital adequacy

ratios increased (with a 21.4% overall solvency ratio at end-2004). Finally, while the share of liquid assets in total assets remained broadly constant, short-term liabilities increased faster than liquid assets.

In Cyprus, bank profitability improved significantly in 2004, with banks' total operating profits before provisions and taxation rising by 65.5% in 2004. This favourable result was mainly due to an increase in net interest income by 27.7% in 2004, against 3.0% in 2003, in a context of contained operating expenses. Income from fees and commissions increased by 16.0% in 2004 compared with a rise of just 3.0% in 2003, while income from foreign exchange grew by 15.2% in 2004 as compared to an increase of 1.0% in 2003. At end-2004, banks' overall solvency ratio on a consolidated basis reached 13.4%, from 13.5% reached at end-2003.

2 THE EURO AREA ENVIRONMENT

2.1 ECONOMIC OUTLOOK AND RISKS

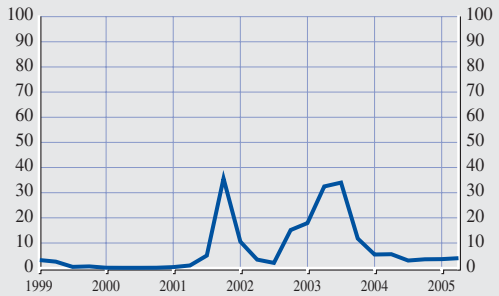
The macroeconomic environment in which financial institutions operate can be an exogenous source of risk for financial stability. This is because macroeconomic conditions have a direct bearing on the ability of economic and financial actors – including households, companies and even governments – to honour their financial obligations.[1] Data that became available after the December 2004 FSR were disappointing, indicating that the economic recovery which began in the euro area in mid-2003 lost some momentum in the second half of 2004. However, looking further ahead, conditions remain in place for moderate economic growth to continue.

The risks surrounding the euro area growth outlook remain similar to those discussed in the December 2004 FSR. On the external side, sources of downside risks to growth continued to be related to high and volatile oil prices as well as to the risks posed by persistently wide global imbalances. Within the euro area, downside risks have been associated with the weakness of private consumption. On the other hand, it cannot be excluded that very favourable financing conditions would support investment growth beyond expectations.

The view of broadly unchanged risks to euro area growth 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 1% in the SPF was broadly constant after Q3 2004 (see Chart 2.1).

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

(Q1 1999 - Q2 2005, %)



Source: ECB.
Note: Calculated as the percentage of the probability distribution for real GDP growth below the threshold of euro area growth of 1% in the Survey of Professional Forecasters (SPF), one year ahead.

2.2 BALANCE SHEET CONDITIONS OF NON-FINANCIAL CORPORATIONS

An evaluation of the credit risks posed by firms for banks and investors in capital markets depends upon both the nature of counterparty exposures and on balance sheet conditions within and across the corporate sector. Loans to non-financial corporations account for around a quarter of the total loans of euro area banks.[2] Non-financial corporations are also important issuers in euro area debt securities markets. For example, by end-2004 the nominal value of the outstanding amount of debt securities issued by euro area non-financial corporations amounted to around 8% (18%) of GDP and around 6% (15%) of total debt securities outstanding.[3]

By mid-2005, the main risks facing the non-financial corporate sector remained similar to those highlighted in the December 2004 FSR. They included uncertainties surrounding the broad macroeconomic outlook, high oil prices, and relatively high levels of indebtedness together with heightened interest rate sensitivity. While indebtedness remained relatively high, the strengthening of corporate

1 In this vein, there is empirical evidence that the risk of distress in the banking sector tends to increase when the pace of economic activity slows down (see the special feature in this issue of the FSR on "Indicators of financial distress in mature economies").
2 This figure is based on unconsolidated monetary financial institution (MFI) data for December 2004.
3 The figures in parentheses include issuance by non-monetary financial corporations (such as special purpose vehicles) that may, however, also be used as indirect finance vehicles for financial institutions.

balance sheet positions that continued in the latter half of 2004 and into early 2005 made a positive contribution to financial stability in the euro area.

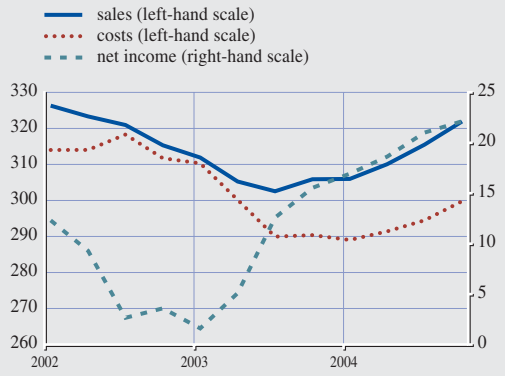
Growth in the profitability of large euro area firms, which started to strengthen in late 2003, continued to improve in recent quarters, thanks to strong sales. This occurred against a background of resilient external demand and cost containment, and in spite of persistently high oil prices and the appreciation of the euro (see Chart 2.2). The latter factors may, however, have had a more pronounced effect on energy and exchange rate-sensitive sectors.

Concerning corporate sector liabilities, while continued favourable financing conditions – including very low interest rates and narrow credit risk premia – may have eased pressures on firms for further balance sheet restructuring, net external financing remained relatively subdued in late 2004 (see Chart 2.3). Two factors potentially explain this. First, the improvement in internal cash flow, resulting from stronger profits, may have eased external financing needs. Second, against the background of a fairly weak and uncertain economic recovery in the euro area, many firms seem to have adopted a cautious attitude towards fixed capital investment.

Relatively modest external funding growth by firms after 2001, in particular due to cuts in capital formation, resulted in a stabilisation of the corporate sector financing gap – measuring net lending or borrowing – at a relatively low level, especially when compared with the nadir of 2000 (see Chart S25). At the same time, debt ratios declined somewhat from their peak in mid-2002, but nonetheless remained at fairly high levels in late 2004 (see Chart S26). There are some indications that firms have been restructuring balance sheets through an effective shortening of their debt, often by buying back existing debt and issuing new debt at lower, often floating/short-term rates (see Chart B4.1 in Box 4). While these developments have not resulted in a reduction in the amount of debt outstanding, they have probably reduced the interest payment burden of the non-financial corporate sector, although this may at the same time have increased the sector's interest rate risk.

Chart 2.2 Costs, sales and profits of Dow Jones EURO STOXX 50 companies

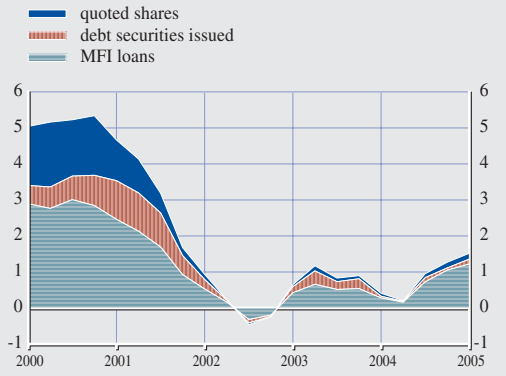
(Q1 2002 - Q4 2004, four-quarter moving average, EUR billions)



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

Chart 2.3 Breakdown of the real annual rate of growth of external financing to non-financial corporations in the euro area

(Q1 2000 - Q1 2005, % per annum)



Source: ECB.
Note: The annual rate of growth is defined as the difference between the actual annual growth rate and the GDP deflator. Latest observations are from February 2005.

Box 4

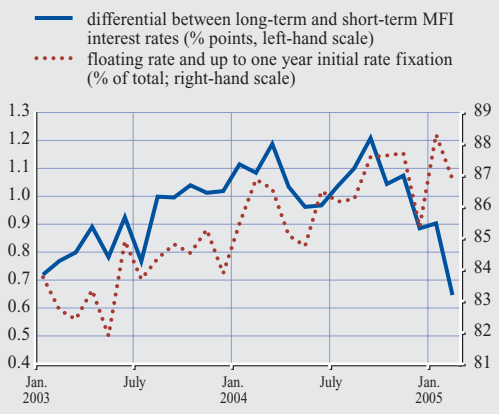
INTEREST RATE SENSITIVITY OF DEBT RAISED BY NON-FINANCIAL CORPORATIONS IN THE EURO AREA

Low short-term interest rates, together with the progressive steepening of the euro area market yield curve observed in recent years, appear to have encouraged non-financial corporations (NFCs) to make increasing recourse to short-term and/or floating rate-based debt financing. To the extent that this has made corporate sector balance sheets more sensitive to rising short-term interest rates, this could have implications for the credit quality of banks. Against this background, this Box examines the short-term interest rate sensitivity of the outstanding bank debt and debt securities issued by firms.

Whereas non-financial corporations in general have tended to lengthen the maturity of their debt, the share of new business loans taken at short-term rate fixation, or even at floating rates, has increased in recent years (see Chart B4.1), which most likely implies an effective shortening of their duration. The growing share of corporate bank loan financing at variable or short-term fixed rates over the past two years mirrors a progressive steepening of the term structure of bank interest rates, although in late 2004 this trend reversed to some extent. Hence, companies seem to have taken advantage of low financing costs at the short end of the yield curve, thereby reducing their overall costs of bank financing. As a result, there was a decline in the overall bank interest rate costs of firms between January 2003 and December 2004 (see Chart B4.2).[1] This occurred despite cumulative growth of around 8% in the amounts of loans outstanding over the same period, indicating that the decline in net interest payments after early 2003 was due to declines in MFI interest rates over the period and, in all likelihood, to the increasing use of short-term/floating rate loans as well. The fall in the net interest payment burden, together with the concomitant strength of corporate profits, significantly resulted in an overall improvement in firms' abilities to service their debts.

1 The bank interest rate cost may be calculated by multiplying the outstanding amounts by their corresponding rates.

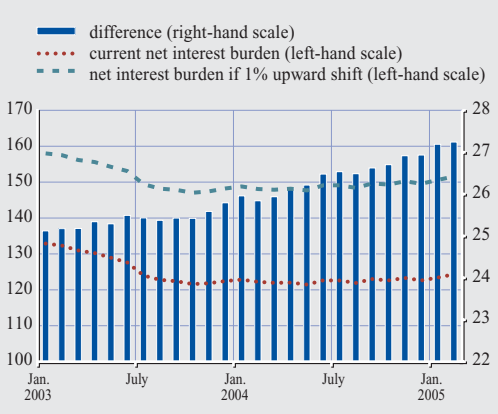
Chart B4.1 New business loans to euro area non-financial corporations with short-term interest rates and term spreads



Source: ECB.

Chart B4.2 Net interest payments on bank debt by euro area non-financial corporations

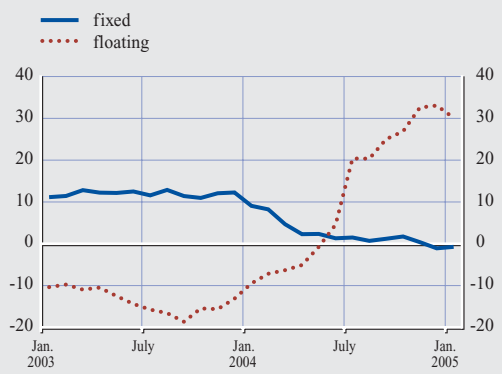
(EUR billions)



Source: ECB.

Chart B4.3: Debt securities issued by euro area non-financial corporations

(% per annum)



Source: ECB.

Notwithstanding the overall improvement in the debt servicing burden of firms, an increasing recourse to floating rate and short-term rate loans is likely to have somewhat heightened short-term refinancing risks (here defined by loan contracts where interest rates are reset within one year) of firms, which might therefore have adverse implications for net interest payments in a scenario of rising short-term interest rates. Under certain assumptions regarding the maturity structure of outstanding loans, it is possible to derive a reasonable estimate of the short-term refinancing risk facing non-financial corporations in the euro area. It is estimated that by end-December 2004, outstanding MFI loans due to be reset within one year corresponded to roughly 60% of total amounts outstanding, or 25% of GDP. Moreover, thanks to the cumulative growth of loans outstanding, a 1% parallel upward shift of the term structure of bank interest rates would have had a larger effect on net bank interest payments at the end of 2004 compared with early 2003. A 1% parallel shift would have resulted in an increase of 22% in the interest burden by the end of 2004, compared with an increase of around 18% in early 2003 (see Chart B4.2). While acknowledging the uncertainty surrounding these estimates, it is nonetheless an indication that the short-term interest sensitivity of euro area non-financial corporations is far from negligible.

While bank borrowing is the predominant source of debt financing for euro area non-financial corporations, "direct" financing through the issuance of debt securities has gained in importance in recent years. With regard to short-term interest rate sensitivity, by end-December 2004 the share of outstanding variable rate long-term debt securities, taken together with short-term debt securities issued by non-financial corporations, amounted to 29% of the total amounts outstanding of non-financial corporate bonds. Assuming an average maturity of five years for the amounts outstanding with maturities over one year implies that 20% of these (or 14.2% of the total) would be refinanced within one year. Overall, around 43% of the total amount outstanding of debt securities issued by non-financial corporations is estimated to be subject to short-term interest rate risk. Since the second half of 2004, non-financial corporations have made increasing recourse to long-term debt securities with floating interest rates (see Chart B4.3). This may indicate that many firms have lengthened the maturity of their debt while continuing to take advantage of the low level of interest rates at the short end. Recent developments therefore suggest that the short-term interest rate sensitivity of the market-based debt of non-financial corporations in the euro area has also risen somewhat since mid-2004.[2]

2 Some non-financial corporations also raise market-based capital indirectly through financial subsidiaries or other financial vehicles included in the non-monetary financial corporate sector. While a major part of the issuance of the non-monetary financial corporate sector is at floating and/or short-term rates, this probably primarily reflects the issuance activity of MFIs. Examples of the types of securities issued include mortgage-backed securitisation to finance an increasing share of variable rate mortgage lending to households. Overall, therefore, it is likely that the short-term interest sensitivity of non-financial corporations is not significantly affected by the strong floating rate issuance activity by this sector.

To conclude, there are indications that the interest rate sensitivity of balance sheets in the non-financial corporate sector has on balance increased in recent years, especially bank-based debt as well as, more recently, market-based debt. As a result, some firms might have to service significantly higher net interest payments if short-term interest rates rise unexpectedly, which might expose pockets of vulnerability in the non-financial corporate sector.

Regarding corporate sector assets, the boost to internal financing resulting from improved earnings performance seems, to some extent, to have been placed in liquid assets, such as short-term deposits held with MFIs.

Turning to the net worth of the corporate sector, the efforts made by firms to consolidate and solidify balance sheets in conjunction with positive valuation changes on their financial asset holdings resulted in a decline in the ratio of debt to total financial assets from the peaks of early 2003. As a result, firms' ability to repay debt by liquidating financial assets has improved (see Chart S27). The most recent data, however, point to a stabilisation at a fairly high level (77%), which is considerably above the level observed in the late 1990s and in 2000 (at around 65%). This remains a continuing source of risk to financial stability.

MARKET INDICATORS OF CORPORATE SECTOR FRAGILITY

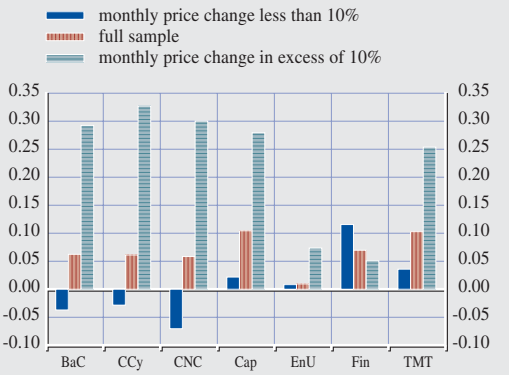
Market-based indicators point to continuing improvement in assessments of corporate sector credit risk after September 2004, as a substantially greater proportion of non-financial corporations' expected default frequencies (EDFs) continued to fall (see Chart S30). The improvement registered in the first quarter of 2005 was particularly noteworthy, as market participants appear to have a markedly more positive assessment of the outlook for the year ahead.

However, market participants have continued to discriminate between large and small listed companies. While patterns in the EDFs of large euro area non-financial corporations in the year up to March 2005 show a significant improvement, the reappraisal of credit risks for smaller firms has been subdued (see Chart S31). Hence, the perceptions regarding growing differences in the operating environment of large and small listed companies identified in the December 2004 FSR appear to have persisted. To the extent that these forward-looking measures provide an indication of the future performance of loans to smaller companies, the outlook for the assets of banks with lending concentrated in this sector remains unchanged.

As noted in the December 2004 FSR, large changes in oil prices tend to be positively correlated with EDFs, indicating that corporations may have some difficulty repaying debt when oil prices rise sharply (see Chart 2.4).

Chart 2.4 Correlation of monthly expected default frequencies and oil price changes

(Jan. 1992 - Mar. 2005)



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

CORPORATE SECTOR RISKS

Looking ahead, downside risks to euro area economic growth still remain along with upside risks to oil prices, both of which could affect corporate sector profitability and the

robustness of balance sheets, particularly as profit growth has shown signs of stabilising. At the same time, analyst forecasts for corporate profitability predict a slowdown to some extent in the year ahead. This is acknowledged by the April 2005 ECB Bank Lending Survey, which revealed that banks were reporting a slight deterioration in the general economic and industry-specific outlook as a reason for tightening credit standards (see Box 10 for more detail on the Bank Lending Survey). Should economic growth prove weaker than currently expected, credit risks for the banking sector could increase in the period ahead.

A further source of risk may relate to the accumulation of debt at floating/short-term rates observed in recent years, which continues to pose a risk to the non-financial corporate sector and, in a scenario of increasing interest rates, might constrain some companies in their ability to honour their debt obligations. However, the incentive to borrow at floating/short-term rates seems to have diminished towards the end of 2004 and in early 2005.

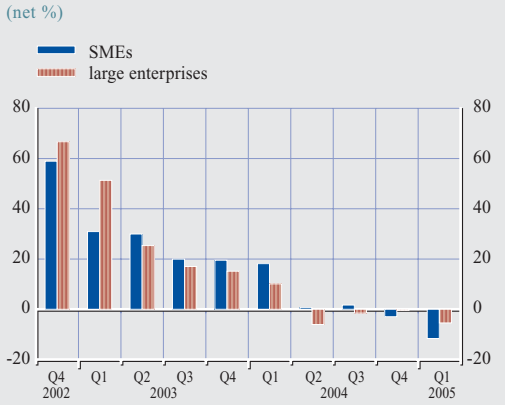
Despite improvements in their access to finance in recent quarters, the situation of SMEs could prove more challenging than the environment facing larger firms, especially as SMEs are relatively more exposed to the still uncertain outlook for domestic demand (see Box 5 on enterprise financing conditions for SMEs).

Box 5

THE EXTERNAL FINANCING CONDITIONS OF SMALL AND MEDIUM-SIZED ENTERPRISES IN THE EURO AREA

In raising external funding, small and medium-sized enterprises (SMEs) frequently face financing conditions that differ to those confronting larger enterprises. This is often due to the fact that enterprises of a different size tend to be exposed to different sources of economic risk. SMEs normally rely on just one or a few business lines, and are thus less diversified in their activities, and they are typically less well diversified geographically than larger firms. This means that SMEs are often more exposed to domestic demand developments. Moreover, without access to the capital markets, SMEs typically face more constraints in accessing external finance, as they are often limited to bank credit.[1] To the extent that some euro area banks, especially smaller ones, may be particularly exposed to the SME sector, both directly through loans to these firms and indirectly through their credit exposure to households that have family members employed by SMEs, it is important from a financial stability perspective to analyse and assess the financing conditions facing SMEs. This Box examines the external financing situation of SMEs in the euro area and draws comparisons with the conditions facing larger enterprises.

Chart B5.1 Changes in the credit standards applied to the approval of loans or credit lines to enterprises

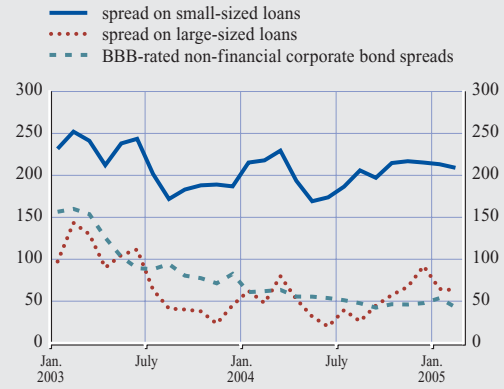


Source: ECB Bank Lending Survey.
Note: The net percentages refer to the difference between the sum of the percentages for "tightened considerably" and "tightened somewhat" and the sum of the percentages for "eased somewhat" and "eased considerably"

1 See also Box 4 in the 2004 ECB Annual Report entitled "Were euro area small and medium-sized enterprises subject to less favourable financing conditions than large enterprises in 2004?".

Chart B5.2 Spreads of MFI interest rates on new business loans to non-financial corporations and BBB-rated non-financial corporate bond spreads

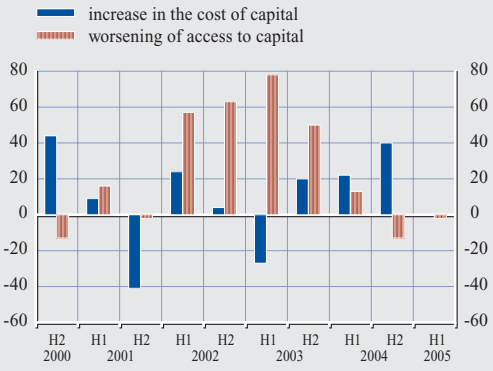
(basis points)



Sources: ECB and Merrill Lynch.
Note: The spread between the rate on new business loans to non financial corporations with one and up to five years' initial rate fixation below (small) and above (large) EUR 1 million and the three-year government bond yield.

Chart B5.3 Changes in the cost of, and access to, capital for small and medium-sized enterprises

(net %)



Source: UNICE.
Note: The net percentage is calculated as the percentage of firms that reported an increase in the cost of capital (a worsening of their access to capital) minus the percentage of firms that reported a decrease in the cost of capital (an improvement in their access to capital) compared with the previous observation period.

Towards the end of 2004, the bank financing conditions of euro area SMEs began to show signs of improvement as reflected, for example, in the April 2005 Bank Lending Survey (see also Box 10), which showed that in Q1 2005, for the fourth quarter in a row, more banks eased than tightened credit standards on the approval of loans to SMEs (see Chart B5.1). This may indicate that underlying the strength of growth in MFI loans to non-financial corporations after mid-2004 was an improvement in SMEs' access to bank credit. One factor driving this easing of credit standards vis-à-vis SMEs might have been a perceived improvement in the sector's profitability, although the lack of comprehensive and timely data on SME profitability makes it difficult to assess whether a marked improvement did indeed take place.

The easing of credit standards applied to SME loans may to some extent reflect the fact that banks, in seeking to boost profitability, have tended to take on more risk in an environment of squeezed margins. The perception that credit to SMEs involves relatively more risk than lending to larger companies is, for example, reflected in the higher credit spreads of MFI interest rates on small-sized new business loans than similar spreads on larger-sized loans (see Chart B5.2).[2] Since mid-2004, bank interest rate spreads on small-sized loans (and more recently also on large-sized loans) over comparable market rates increased by around 40 basis points, thus indicating that while banks may have eased credit standards towards SMEs, they also appear to have priced in higher risk by demanding higher premia. Moreover, a survey by UNICE, an employer's association, confirms that banks have recently been relaxing access to capital while, at the same time, raising the relative cost of bank financing (see Chart B5.3).

All in all, if domestic demand growth in the euro area were to prove weaker than expected, this could entail some risks for the credit quality of the SME sector. Banks have been raising spreads on loans to the SME sector, and there are indications that banks have also been responding to intense competition from other banks and hunting for yield in an environment of

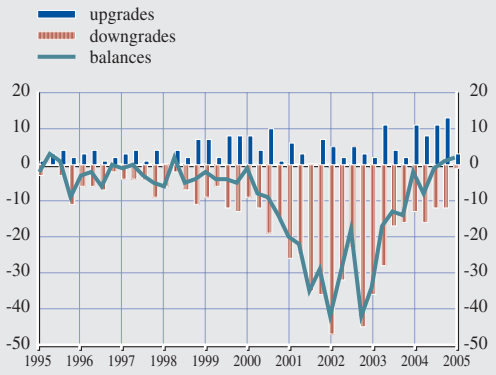
2 This assumes that loans up to EUR 1 million are predominantly granted to small-sized firms, while loans over EUR 1 million are mostly granted to large companies.

low interest rates. However, it remains unclear whether risks are being priced appropriately. In other words, it cannot be excluded that banks may have taken on more risk by supplying more credit to the SME sector on easier terms.

Notwithstanding the risks confronting the corporate sector in the period ahead, the recent improvement in the (expected) earnings performance of firms and the strengthening of balance sheets produced a further improvement in credit ratings: in Q4 2004 the ratio of rating upgrades to downgrades turned positive for the first time since Q2 1998 (see Chart 2.5). These developments occurred in parallel with a continued tightening of corporate bond spreads, although by the beginning of April 2005 spreads had begun to widen slightly (see Chart 3.6).

Chart 2.5 European non-financial corporate sector downgrades, upgrades and balance

(Q1 1995 - Q1 2005)



Source: Moody's.

2.3 HOUSEHOLD SECTOR BALANCE SHEETS

An evaluation of the credit risks that households pose for banks depends upon both the nature of banking sector exposures – including whether loans are secured or not – and on balance sheet conditions within and across the household sector. As a proportion of the total loans outstanding of euro area banks, loans to households account for almost a third.[4]

The continued strength of loan growth to households at the beginning of 2005 was driven by the low interest rate environment and favourable financing conditions offered by banks. Most of the growth was due to the continued strength in borrowing for house purchase, which is mostly secured. Growth in consumer credit, which is mostly unsecured, also remained buoyant (see Chart S34). Household sector indebtedness in the euro area, measured by the ratio of total loans to GDP, scaled new heights in the fourth quarter of 2004 (see Chart S32).

The level of household indebtedness in the euro area does not necessarily pose a material risk to financial stability in itself: it is notable that households in other parts of the world have been able to carry much heavier debt burdens than those in the euro area (see Box 6). However, it is the sustainability of the outstanding debt that matters. In this context, debt sustainability is defined as the ability of the household sector to face the obligations related to the debt incurred. Determining the sustainability of debt burdens can be complex, as this depends not only on the level of debt, but also on factors such as labour market conditions and the level of interest rates.

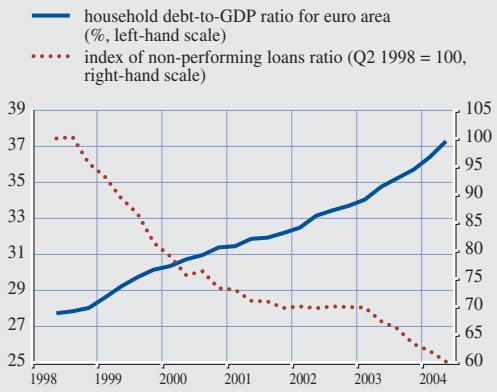
There have been few signs of fragility in the euro area household sector as a whole. An index of the ratio of non-performing to total household loans, based on data for six euro area countries, provides an ex post measure of household defaults.[5] In 2004, this indicator stood at its lowest recorded level, having continuously declined since 1998, even though

4 This figure, which includes lending to individual enterprises, is based on unconsolidated MFI data for December 2004.

5 Non-performing loans can broadly be defined as loans that are at least three months in arrears. However, the concept of arrears differs across countries.

Chart 2.6 Debt and non-performing loans of euro area households

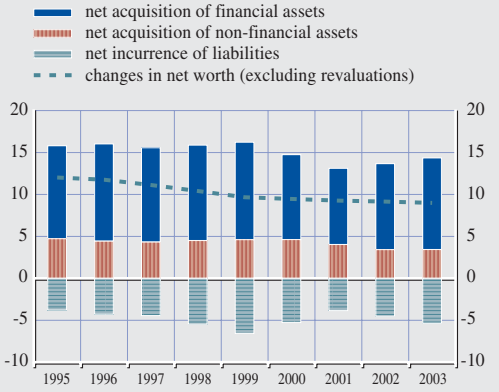
(Q2 1998 - Q2 2004)



Sources: ECB, Eurostat and NCBs.
Note: The non-performing loans ratio includes six countries for which non-performing loans data are available: Belgium, Spain, France, Ireland, Italy and Portugal. Non-performing loan ratios for each country, based on total loans, are aggregated using weights in the aggregate debt.

Chart 2.7 Changes in euro area households' net worth

(1995 - 2003, % of disposable income)



Source: ECB.

the same period saw a rapid accumulation of debt (see Chart 2.6). While improvements in risk management techniques by banks, as well as better possibilities for credit risk transfer (such as securitisation), may have contributed to the declining default rate on retail mortgage loans, the presence of very low interest rates, coupled with buoyant housing market conditions, is likely to have played an even more important role.

However, it is important to bear in mind that, as a backward-looking measure of credit risk, this indicator may shed little light on whether indebted households are more likely to fall into arrears than in the past.

The outlook for household sector loan defaults depends mainly on the ability of the sector to make timely payments on outstanding debt out of income. The estimated total debt service burden of the household sector, including both the repayment of principal and the payment of interest, has remained broadly stable since 2000 at slightly below 12% of disposable income.[6] This is because the impact of rising debt servicing costs caused by the increase in household indebtedness was offset by low interest rates (see Chart S35).[7]

The best measure for assessing the solvency of the household sector (i.e. the ability of the sector to repay obligations from assets if necessary) is the sector's net worth (financial plus non-financial assets less debt). In the absence of a measure of household sector net worth for the euro area, flow data can provide an indication of changes in household net worth (excluding valuation effects).[8] In this respect, it is notable that although households significantly increased their liabilities after 2001, this was dwarfed by the accumulation of assets, and net worth continued to increase strongly (see Chart 2.7).

6 Repayment flows are estimated based on an assumption of a constant loan maturity structure at the euro area level.

7 Some research based on individual US household balance sheets 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.

8 The volatility of the stock of net worth may also provide information about the diversification effects arising from the composition of different assets and liabilities. However, this information is unavailable due to the lack of official data on the housing stock, which is thought to constitute the bulk of euro area households' assets.

Box 6

HOUSEHOLD DEBT RATIOS IN THE EURO AREA FROM AN INTERNATIONAL PERSPECTIVE

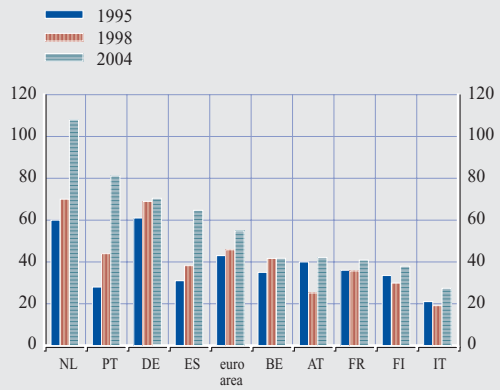
Household borrowing has increased considerably in a number of regions of the world over the past decade, bringing debt ratios to unprecedented heights. This has not only raised some questions about sustainability, but has also highlighted differences in the level and the evolution of debt ratios across countries. This Box examines the level of household debt ratios within the euro area and in comparison with a selection of mature economies.

In the fourth quarter of 2004, estimates of the euro area household debt-to-GDP ratio further increased to 55%. However, this figure masks substantial differences between euro area countries, with ratios ranging between 108% (the Netherlands) and around 27% (Italy) (see Chart B6.1). Outside the euro area, there are also considerable differences and, on average, even though they have been rising, household debt ratios in the euro area are among the lowest in the mature economies. Denmark, the UK, Australia, the US and Sweden all have debt ratios that exceed the euro area average (see Chart B6.2).[1] Aggregate numbers may not, however, always be meaningful for assessing sustainability, as the proportion of households carrying debt differs between countries. For instance, in the US, the Netherlands and Spain, the proportion of indebted households is around 65%, whereas in Australia and Germany around 40-50% of households have taken on debt, compared with only 19% in Italy.[2] An additional consideration for some of these countries is that the high level of net wealth (financial and housing) should be taken into account when assessing the sustainability of debt.

Rising household debt ratios over the past decade are often explained by the strength of house prices together with low interest rate levels. For example, the December 2004 FSR highlighted

Chart B6.1: **Debt ratios within the euro area**

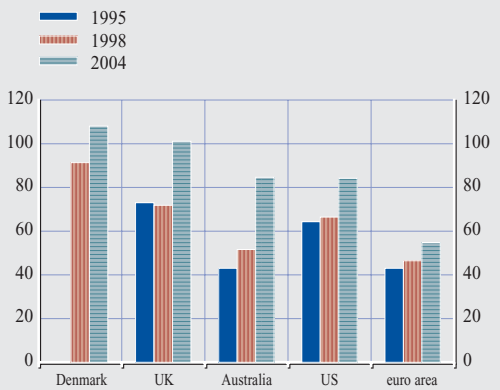
(% of GDP)



Source: ECB calculations based on national financial accounts data.
Note: The ratio for Finland refers to 2003.

Chart B6.2: **Debt ratios for the euro area and outside the euro area**

(% of GDP)



Sources: ECB, Australian Bureau of Statistics, Reserve Bank of Australia (RBA), Bureau of Economic Analysis, Federal Reserve, Bank of England and Danmarks Nationalbank.

1 It is important to note that definitions of debt can differ across countries.
2 See J. Crook (2003), "The Demand and Supply for Household Debt: A Cross-country Comparison", mimeo, University of Edinburgh.

the close relationship between increases in house prices and loans for house purchase in euro area countries between 1998 and 2003.

There are several reasons why debt ratios may differ across countries. The incurrence of debt depends critically on the availability, cost and flexibility of debt financing. The underlying factors are to be found on both the demand side and the supply side, with the latter closely related to developments in capital markets and funding practices (see Box 14 in the December 2004 FSR). Moreover, the number of housing transactions is clearly different between EU15 countries. For instance, in relation to the size of the population, the number of transactions is highest in Ireland and the UK, and comparatively high in Denmark, Greece and Sweden, the latter twice as high as in Germany.

Different housing finance markets also have some specific features that may affect the level of housing-related debt. For example, the possibility to borrow more for the same collateral, re-mortgaging and the taking out of second mortgages – benefiting from low refinancing costs and increased house values – are common in the US, the UK, Australia and a few euro area countries (such as the Netherlands and, to a lesser extent, Ireland). Furthermore, a buy-to-let market, where households invest in properties for renting, may also lie behind higher debt ratios in specific countries. This is particularly the case in the UK and Australia, although this trend represents a small part of the stock. The rate and amount of first-time buyers, as well as the rate of owner-occupation, may also be factors contributing to debt ratios and may help to explain why they differ between different countries. For example, countries such as Australia, the US and the UK have reasonably high rates of owner-occupation (around 70%), which potentially explains the higher household debt levels in these countries. However, other factors appear to play a role, since other countries where households are highly indebted, such as Denmark and the Netherlands, have fairly low owner-occupation rates of below 55%.

To sum up, household debt ratios differ rather widely between regions and countries, with a variety of factors that could explain these differences. From a financial stability perspective, the scale of household sector indebtedness matters only to the extent that it affects the ability of households to service outstanding debt.

Other yardsticks of household sector solvency are the ratios of debt to liquid financial assets and debt to total financial assets. Liquid financial assets (namely deposits and currency held by households) can be converted into cash for immediate use, with little or no loss in value. Total financial assets also include less liquid assets, such as securities, which can be sold relatively quickly, but are subject to variations in their value according to market developments. Both of these ratios reached high levels in 2004 (see Chart S33). While liquid assets were more than sufficient to repay debt, financial assets (at their current market value) were sufficiently large to repay the outstanding debt of the sector virtually three times over.

Overall, euro area households seem to be in a healthier financial position than, for instance, US households, as the former have a higher saving ratio and a lower proportion of assets exposed to changes in market value. However, this assessment depends on euro area households' income expectations being realised.

While the assessment of household debt sustainability at an aggregate level is rather positive, it should nevertheless be qualified

since it does not take into account the potentially unequal distribution of financial assets among indebted households.

HOUSEHOLD RISKS

Looking ahead, the main sources of risk for financial pressures on households that could have implications for financial stability can be classified into three areas: income, property prices, and interest rates.

UNCERTAINTY REGARDING INCOME EXPECTATIONS AND THE MACROECONOMY

The uncertainty surrounding the euro area growth outlook mentioned in Sub-section 2.1 may have consequences for employment prospects, and thus for developments in households' disposable income, impacting on households' ability to service debt.[9] According to the results of the European Commission Consumer Survey, euro area households' expectations concerning their future financial situation for the 12-month period ahead began to recover in early 2005, mostly related to an improved perception of employment prospects (see Chart 2.8).

Chart 2.8 Euro area households' financial situation and unemployment expectations

(Q1 1998 - Q1 2005, three-month 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.

However, the impact of a shock to income is highly dependent on the distribution of debt across categories of households facing different financial conditions. This distribution is influenced by characteristics such as the income level, the amount of other loans taken out, the employment situation, financial asset holdings and wealth. If financial leverage has supported demand for housing in household categories that are the least able to afford it, or among those more exposed to a labour market downturn, the risk is higher for the same aggregated indebtedness at a sector level.

In the absence of any assessment based on micro data at the euro area level, some indications are available from a number of national studies that use national surveys on household finances to explore the distribution of debt across household income segments.[10] A common finding is that the most heavily indebted households also tend to be those in the highest income segment and which hold relatively more financial assets. Therefore, their financial margin to withstand a shock to their income would be higher. It is nevertheless difficult to draw conclusions on this basis for the euro area as a whole.

RISKS TO HOUSE PRICES

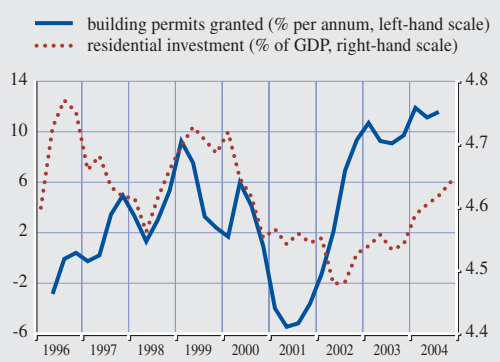
During late 2004 and early 2005, residential property prices remained very dynamic in a number of Member States. Favourable financing conditions and expected capital gains seem to have supported strong demand, rather than the growth in household disposable income. The rapid pace of increase seen in

9 Some analysis for the UK shows that income shocks or labour market disruptions were the most important determinants of household insolvencies in the early 1990s: see A. Coles (1992), "Causes and Characteristics of Arrears Possessions", Council of Mortgage Lenders and J. Ford et al. (2004) "Homeowners Risk and Safety Nets: Mortgage Payment Protection Insurance and Beyond", Office of the Deputy Prime Minister, London.

10 These include, for instance, studies that use data from the Banca d'Italia survey of household income and wealth, De Nederlandsche Bank's household survey, and Statistics Sweden's surveys on income distribution (HINK) and household finance (HEK).

Chart 2.9 Building permits and residential investment in the euro area

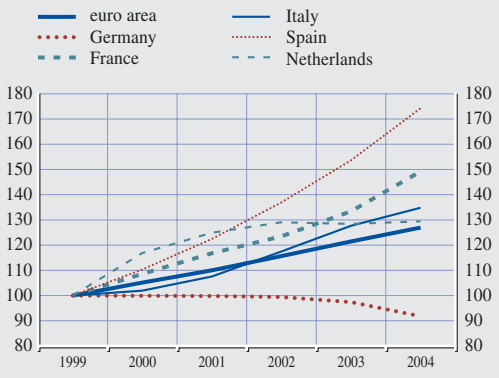
(Q1 1996 - Q4 2004)



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

Chart 2.10 House price-to-rent ratio for the euro area

(1999 - 2004, index: 1999 = 100)



Sources: National sources and ECB calculations.

some countries since the mid 1990s calls for close monitoring, given the potential implications for these economies and the region as a whole.

On the supply side, a pick-up since 2002 in residential investment and building permits in number of countries (see Chart 2.9) points tentatively to the beginning of a more significant supply-side adjustment to the strong developments seen in the housing market. If such developments continue, they could play a role in alleviating some pressure in the market, thereby contributing to an adjustment toward lower house price increases.

As mentioned in the December 2004 FSR, a sustained deviation between rents and house price developments could be indicative of some drift away from intrinsic values.[11] Notably, house price-to-rent ratios increased further in some euro area Member States in 2004 (see Chart 2.10). However, these indicators do not necessarily suggest an imminent risk of a downward adjustment of house prices in the short run.

According to the results of the April 2005 Bank Lending Survey, households and banks might have assessed housing market prospects and the associated risks differently: while it was seen by banks as a factor contributing to a net tightening of credit standards, perceived positive prospects seem to have driven household demand for loans in the first quarter of 2005.

INTEREST RATE RISK

Overall, the interest rate risk facing households still appears limited, in line with the assessment in the December 2004 FSR. Its impact will primarily depend on the extent of the interest rate variability of loans, and some other features of mortgage contracts, which vary widely across countries.

According to estimates presented in the December 2004 FSR, about one-third of the outstanding stock of mortgage debt may be affected in the short run by a change in interest rates; while about half of the stock of loans is at fixed rates or is quasi-fixed (i.e. has a long initial period of interest rate fixation), which would tend to dampen the initial effect of

11 The concept of fair value is difficult to apply to housing. Furthermore, it is hard to distinguish between quality improvements and genuine house price inflation. Finally, the choice of the base period for comparison may have an important bearing on the interpretation.

interest rate changes on repayment burdens. This notwithstanding, new borrowers could be more sensitive, as a greater proportion of them are indebted at variable rates, and have not amortised a significant amount of their principal.

ASSESSMENT OF HOUSEHOLD SECTOR RISKS

All in all, the level of indebtedness of the household sector as a whole does not appear to constitute a near-term threat to the stability of the financial system. 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.

However, the balance of risks to financial stability as they relate to the household sector are unequally spread across Member States. As noted in both Box 6 of this review and the December 2004 FSR, differences exist across these countries in terms of debt levels, house price developments, as well as whether interest rates vary over the term of the loans. It should be recalled that most of the countries that have experienced a substantial increase in house prices in recent years have a preponderance of variable rate debt. This may amplify the effect of 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. Negative wealth effects could additionally be created, although their magnitude is difficult to gauge empirically. An uncontrolled correction in house prices does not appear likely in the short run for the euro area as a whole. Despite this, the continued strength of house prices in some Member States calls for ongoing monitoring and surveillance.

III THE EURO AREA FINANCIAL SYSTEM

3 EURO AREA FINANCIAL MARKETS

3.1 KEY DEVELOPMENTS IN THE MONEY MARKET

MONETARY POLICY RATES REMAIN UNCHANGED IN THE EURO AREA

Conditions in the euro area money market are important from a financial stability perspective for at least two reasons. First, the ECB implements its monetary policy in this market, and effective implementation requires that it functions smoothly. Second, the euro area money market is also the market in which banks usually secure their day-to-day liquidity needs. Because of this, tensions in the money market can provide early indications of any liquidity difficulties facing large euro area institutions.

There has been no change in the level of monetary policy interest rates in the euro area since November 2004, and the minimum bid rate for the main refinancing operations has remained at 2% since June 2003. While interest rate expectations have been subject to ebb and flow, the general tendency over the last six months has seen a further postponement of tightening expectations. Reflecting this sentiment, by the end of April 2005 expected EONIA rates derived from short-term swaps were fully pricing in a 25 basis points rate hike by the ECB only in the second quarter of 2006, compared with previous expectations that a hike would occur as early as the first half of the year.

GENERAL MONEY MARKET CONDITIONS REMAIN FAVOURABLE

The spreads between uncollateralised interbank money market rates and collateralised repo rates can provide indications as to the perceptions of money market participants concerning counterparty credit risks. Over the last six months, these spreads have changed little apart from the usual modest widening around the turn of the year related to higher demands for liquidity, and have remained low across all short-term maturities (see Chart S36). This suggests that perceptions of counterparty credit risk in euro area money markets remain rather low.

Bid-ask spreads can provide an indication of the liquidity conditions in different segments of the money market. These have remained rather low since late 2002, and more recently have declined even further (see Box 7 and Chart S37). The narrowness of these spreads has reflected a high level of market liquidity, suggesting that, on aggregate, market participants have faced little difficulty in accessing short-term funding.

3.2 KEY DEVELOPMENTS IN CAPITAL MARKETS

GOVERNMENT BOND MARKETS

In the euro area fixed income markets, after November 2004 long-term government bond yields – which set a benchmark for the level of risk-free interest rates – were subject to similar, albeit more muted, swings compared to US Treasury yields. After reaching long-term lows below 3.5% in mid-February, yields rose gradually again. By early May 2005, they stood at low levels of 3.5%, which is still slightly lower than six months ago. As patterns in euro area yields were less pronounced, there was a marked widening of the US-euro area ten-year interest rate differential to the highest level recorded since June 2000 (see Chart 3.1).

Chart 3.1 Differential between ten-year government bond yields in the US and in the euro area

(Jan. 1999 - May 2005, basis points)

Source: Bloomberg.

Box 7

THE NARROWING OF BID-OFFER SPREADS IN MONEY MARKET INSTRUMENTS

A notable pattern in the euro area money market – which comprises short-term deposits, FX swaps, repos and EONIA swaps – has been the continued narrowing of bid-offer spreads, especially in 2004. Bid-offer spreads can provide a yardstick of liquidity in the market; the increased volume and liquidity in the EONIA swap market has sometimes compressed spreads to less than a basis point, making it less attractive for banks to act as market makers. This Box reviews some of the factors that lie behind this compression of bid-offer spreads and assesses some of the possible implications.

Between early 2002 and early 2005, bid-offer spreads for EONIA swaps narrowed substantially over the whole money market maturity spectrum up to 12 months. On average, they roughly halved from around 2 basis points to around 1 basis point over this period. Most recently, spreads for maturities beyond one month traded even narrower than one basis point (see Charts B7.1 and B7.2).

Chart B7.1 Bid-offer spread of one-week EONIA swaps

(basis points, 20-day moving average)

Source: E-mid.

Chart B7.2 Bid-offer spread of three-month EONIA swaps

(basis points, 20-day moving average)

Source: E-mid.

Market observers have attributed the narrowing of bid-offer spreads in the euro area money market to several factors, five of which seem most significant. First, market transparency has increased and there has been an increase in professionalism outside the banking industry, so that clients are generally well-informed about market conditions and require the best prices. Second, the market has benefited from economies of scale, with larger ticket sizes reducing the number of deals and hence the costs per individual transaction, with this cost reduction being passed on to narrower quotations. Third, deepening liquidity in other segments of the money market has also played a role: in the Euribor futures market, a natural hedge for the EONIA swap market, spreads tend to be as narrow as 0.5 basis point. Fourth, the importance of cash lending for longer maturities has been declining, triggered by banks' growing awareness of the solvency costs for their assets. This has led to increased competition in shorter-term cash products as well as in derivatives markets (such as the EONIA swap market), which require less solvency capital than traditional interbank lending, while allowing a more effective management of interest rate risk. Fifth, the very low level of interest rates, coupled with low volatility, has also played a role by lowering the risk of market-making activity.

While a deep and liquid money market can make an important contribution to the stability of the financial system, 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. This could ultimately tempt market makers into deals with higher margins, but which most likely also entail higher risk.

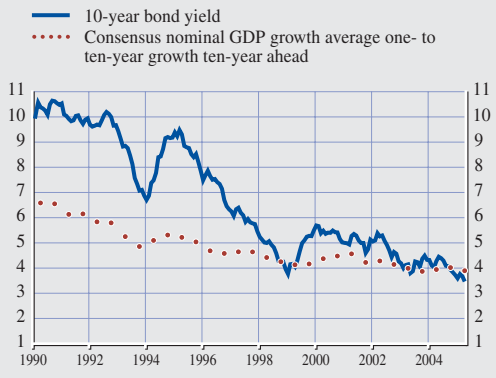
Although euro area ten-year bond yields have dropped below long-term consensus expectations for nominal GDP since November 2004 (see Chart 3.2), the gap between the two remains far narrower than in the US. This suggests that the risk of any sudden increase in euro area government bond yields, which would be relevant from a financial stability perspective, may come less from a misalignment with domestic economic fundamentals than from either the potential for a spillover from developments in the US Treasury market, where upside risks to long-term yields appear more sizeable, or from sharp increases in oil prices.

Similar to the factors driving US bond yields, the low level of long-term government bond yields in the euro area seems to have been predominantly demand-driven. One potentially important factor in this respect could be the demands of official (Asian) investors. As already discussed in the foreign exchange section, it appears that several central banks have continued to conduct active intervention policies. At the same time, tentative evidence exists that some of the intervention proceeds have been diversified away from the US dollar, the euro being one of the main beneficiaries. It also cannot be excluded that investor demand for euro area bonds has benefited, at least in part, from the recycling of petrodollars.

Another factor potentially weighing on euro area bond yields is the continued importance of abundant liquidity and associated yield curve carry trades, which in their most rudimentary form involve purchasing one security with more yield, or carry, than the one that is sold. As in the US, the euro area yield curve has flattened over the last six months, although the change in the shape of its term structure was less pronounced than in the US. With the euro area curve thus becoming steeper than the US curve, yield curve carry trades may have become relatively more attractive in the euro area than in the US.

Chart 3.2 Euro area ten-year bond yield and consensus ten-year nominal GDP growth expectations

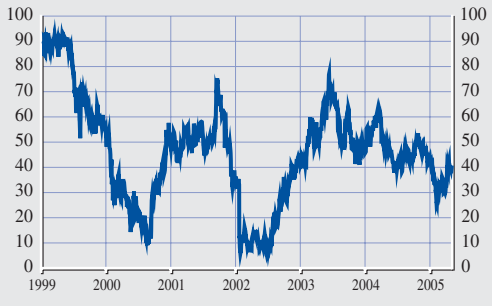
(Jan. 1990 - Apr. 2005, %)



Sources: ECB and Consensus Economics.

Chart 3.3 Yield differential between ten and 30-year euro area government bonds

(Jan. 1999 - May 2005, basis points)



Source: Reuters.

The strength of demand for longer-term bonds over the past six months was also apparent in the pricing of 30-year government bonds after November 2004, with the spread between 30 and ten-year yields tightening significantly until early February before once again widening somewhat recently (see Chart 3.3). This demand appears to some extent to have reflected recent regulatory changes in some countries designed to address asset-liability mismatches of insurance companies and pension funds by requiring them to extend the duration of their asset portfolios. While balance sheet restructuring may take some time, some "front-running" by hedge funds and other speculative investors, anticipating future demands for long-term bonds, may have been behind the compression of long-term spreads. Taking advantage of this demand, the French debt management agency issued a 50-year bond in February 2005, and the British debt management office announced the issuance of such a bond for May 2005, while the German and Italian debt management agencies have been considering issuing similar securities (see Box 8).

Box 8

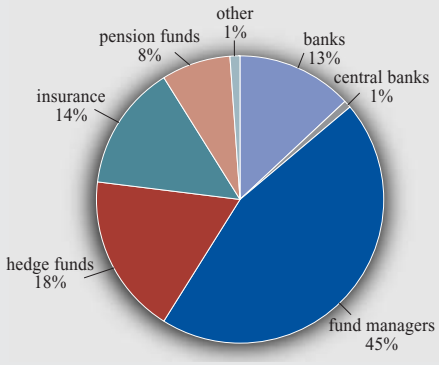
THE EXTENSION OF THE EURO YIELD CURVE TO ULTRA-LONG MATURITIES

By expanding the range of securities available to agents for facilitating investment and the hedging of financial risks, financial innovation can – through better tailoring of risk-return trade-offs to individual wants and needs – contribute to enhancing the stability of the financial system. At the end of February 2005, the French Treasury issued the first euro-denominated 50-year government bond. The 4% Obligations Assimilables du Trésor (OAT) bond maturing in 2055 is the longest-maturity bond on the euro yield curve. Investor demand has been very high: while the issuance amount was EUR 6 billion, the order book reached a total volume of EUR 19.5 billion and the yield at issuance was 4.21%, just 3 basis points above the comparable 30-year bond at that time. Moreover, demand was widespread among different investor groups and by geographical distribution (see Charts B8.1 and B8.2). This Box examines some of the factors that motivated the launch of, and high demand for, this new OAT bond, an innovation which marks the creation of a new segment on the euro yield curve and represents a further step in the development of the euro fixed income market.

From an issuer perspective, an important factor that appeared to have motivated the timing of the launching of the French 50-year bond was the very low level of long-term interest rates, allowing the locking in of very low debt servicing costs for very long maturities, a factor that appears to be giving rise to similar considerations in many other European countries. While long-term interest rates have reached very low levels, the strength of investor demand for a very long-dated fixed income security appears to be mainly structural; primarily reflecting expected demographic trends and balance sheet mismatches among some institutional investors.

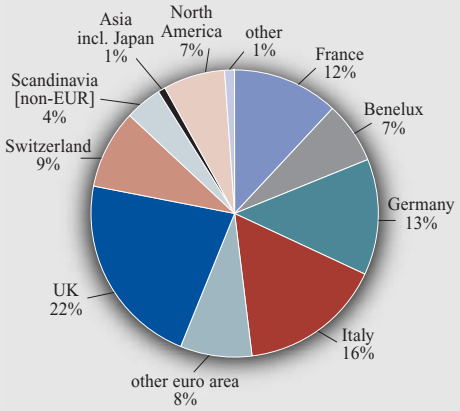
Concerning demographic trends, the ageing of populations in many mature economies is expected to increase the need for long-dated investments. This is because the combination of a greater number of pensioners and longer life expectancy raises the demand for retirement savings, either intermediated through pension funds or life insurance products, or through direct investment by individual investors. As planning for retirement typically involves lengthy investment horizons, long-maturity bonds can provide a natural investment vehicle for funding pensions.

Chart B8.1 Distribution by investor group



Source: Agence France Trésor.

Chart B8.2 Geographical distribution of investors



Source: Agence France Trésor.

Concerning balance sheet mismatches, some institutional investors such as life insurers and pension funds have so-called duration (or interest rate sensitivity) mismatches between their assets and liabilities,[1] as the maturities of liabilities are often longer than those of assets (see Box 16 in the December 2004 FSR). This exposes the balance sheets of these institutions to interest rate risk. In some countries (e.g. Denmark, the Netherlands and the UK), regulatory changes have taken place that will involve simultaneous market valuation of assets and fair valuation of liabilities, while the implementation of International Accounting Standard (IAS) 19 will expose these mismatches across Europe. As a result, there has been growing demand from institutional investors for fixed income instruments. Moreover, a survey conducted by the French Treasury in advance of the launch of the 50-year bond found that the equity investments of pension funds and insurance companies were at relatively high levels.[2] Based on an hypothetical assumption that European pension funds, which hold almost EUR 1 trillion in equities, were to shift a quarter of these assets into long-dated bonds, the French Treasury foresees a potential demand for these products of over EUR 200 billion over the medium term.

Another feature of fixed income bonds with very long maturities is their convexity profile, which makes them attractive to speculative investors such as hedge funds.[3] If two bonds offer the same duration and yield, but one exhibits greater convexity, then changes in interest rates will affect their values differently. A bond with greater convexity will be less affected by changes in interest rates than one with less convexity. This means that bonds with greater convexity will have higher prices than comparable bonds with less convexity. Although a 50-year bond has a longer duration than a 30-year bond, the rise in duration when moving from a 30-year to a 50-year maturity is significantly smaller than the increase in convexity. As bonds with greater convexity outperform bonds with less convexity regardless of the direction of

1 Duration is a yardstick of the sensitivity of a bond's value to a change in interest rates.
2 For a summary of the survey results, see Agence France Trésor's press release of 18 February 2005.
3 The relationship between a bond's value and the level of interest rates is typically not proportional, and convexity measures this aspect of the price-yield relationship. Used in conjunction with duration, this enables a more refined estimate of bond price sensitivity to changes in interest rates.

changes in interest rates, this feature can make 50-year bonds very attractive on a relative basis. According to the French Treasury, the convexity of the 50-year bond is around 80% higher than that of the comparable 30-year bond, whereas its duration is only around 35% greater. In an environment of relatively low bond market volatility with the potential for an increase over the medium term, this may have been an additional factor explaining the high level of demand for this security among hedge funds.

Overall, the launching of the French 50-year bond represents a further step in the broadening of capital markets in the euro area. By satisfying investor demand, predicated on the better management of interest rate risk, the availability of this security should contribute to enhancing the stability of the financial system.

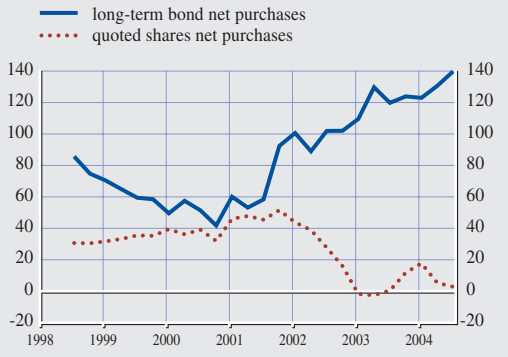
Balance sheet restructuring involving purchases of long-term government bonds are likely to lead to a relative decline in demand from the pension and life insurance sectors for other asset classes, most importantly equities. In this vein, indications of growing purchases of long-term bonds by pension funds and insurance companies have been mirrored by a tapering off of equity purchases since mid-2002 (see Chart 3.4). These institutional investors, especially pension funds, continued to express a preference for bonds vis-à-vis equity, particularly in the wake of the bursting of the dot-com bubble.

Notwithstanding a short-lived rise after the bond market changed direction in mid-February, implied bond market volatility, a yardstick of the degree of uncertainty prevailing in bond markets, remained close to post-EMU (Economic and Monetary Union) lows in the euro area after November last year (see Chart 3.5). As in other market segments, in order to avoid the risks associated with complacency, these low levels of implied volatility should be interpreted cautiously, even if they have mirrored realised volatility.

Indicators of the balance of risks to bond yields in the period ahead as perceived by market participants have since late 2003 pointed to 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 positive into early 2005 (see Chart S38).

Chart 3.4 Net purchases of long-term bonds and equities by euro area insurance corporations and pension funds

(Q3 1998 - Q3 2004, EUR billions, one-year moving cumulative purchases)



Source: ECB.

Chart 3.5 Implied bond market volatility in the euro area

(Jan. 1999 - May 2005, ten-day moving average)

Sources: Bloomberg and ECB calculations

CORPORATE BOND MARKETS

Corporate bond spreads in the euro area remained at very low levels after November 2004, especially for low quality issuers (see Charts S45 and S46). Balance sheet repair, the strength of corporate profitability, low implied equity market volatility as well as favourable corporate credit rating actions all contributed to keeping spreads very tight. Nevertheless, another likely factor has been continued indications of a search for yield among investors in an environment of very low interest rates and ample liquidity in the economy, although the importance of this is difficult to gauge. Non-financial corporate bond spreads have tended to indicate more optimistic perceptions of corporate sector credit risks than EDFs for the sector, while also remaining rather insensitive to consensus expectations regarding real economic activity (see Box 9).

Box 9

CORPORATE BOND SPREADS AND DEFAULT EXPECTATIONS IN THE EURO AREA

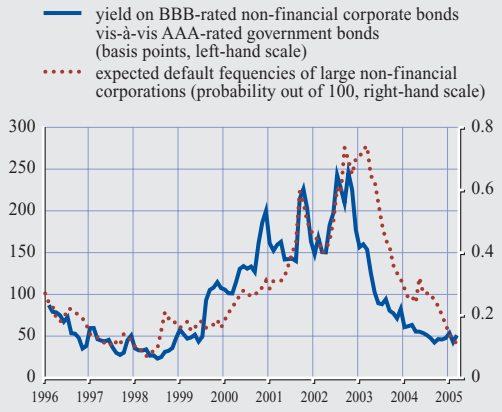
In theory, corporate bond spreads, defined as the difference between yields on corporate and government bonds with similar maturities, should be pricing in default expectations over the entire maturity of the bond. If the pattern in corporate bond spreads begins to suggest that market participants are not taking account of other forms of forward-looking information on default rates, this could be seen as a sign of myopia, and might suggest a risk of misaligned prices in the corporate bond market. This Box addresses the issue of whether prices in the euro area non-financial corporate bond market have become misaligned by examining the relationship between non-financial corporate bond spreads and two other forward-looking indicators for the short-term probability of default, i.e. over the next 12 months.

A direct equity market-based indicator for corporate sector credit risk is the median expected default frequency (EDF) within the following year of the roughly 850 largest stock market-listed euro area non-financial corporations. Assuming that defaults are correlated with the pace of economic activity, an indirect measure of credit risk is the average consensus economics forecast for euro area real GDP growth one year ahead. For instance, in the later stages of an economic upswing, as the pace of economic activity begins to peak, investors – because they are forward-looking – tend to demand higher risk premia, fearing that overinvestment may reduce future returns on capital, and that bankruptcy rates may begin to rise as well.[1]

Charts B9.1 and B9.2 plot the corporate bond spread, defined as the spread between the yields on BBB-rated non-financial corporate bonds, the lowest investment-grade rating class, and on AAA-rated government bonds, the highest investment-grade rating class, together with EDFs extracted from the equity market, and the consensus GDP growth expectations for one year ahead. The first chart shows that corporate bond markets were more optimistic than equity markets after corporate bond spreads peaked in 2002, but that pricing became increasingly similar in early 2005, reflecting low volatility in equity markets – a key component in the estimation of EDFs (see Box 13). The second chart shows that corporate bond markets have mostly ignored information about the euro area economic outlook since 2003: while growth

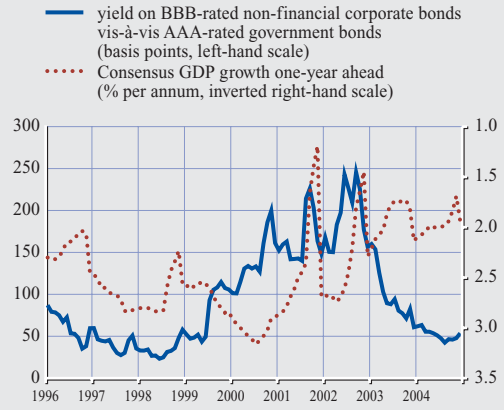
1 See European Central Bank (2005), "Determinants of the Fall of Corporate Bond Spreads in Recent Years", Monthly Bulletin, January, pp. 24-25, G. de Bondt (2004), "The Balance Sheet Channel of Monetary Policy: First Empirical Evidence for the Euro Area Corporate Bond Market", *International Journal of Finance and Economics,* 9, 3, pp. 219-28 and Z. Zhang (2002), "Corporate Bond Spreads and the Business Cycle", Bank of Canada Working Paper, No 2002-15, June.

Chart B9.1 Non-financial corporate bond spreads and expected default frequencies



Sources: Merrill Lynch, Moody's KMV and ECB calculations.

Chart B9.2 Non-financial corporate bond spreads and consensus one-year ahead real GDP growth



Sources: Consensus Economics, Merrill Lynch and ECB calculations.

forecasts declined, spreads continued to narrow. It should however be noted that the two expected short-term default rate indicators approximate the expected default rates 12 months ahead, whereas corporate bond spreads reflect default rates over the entire maturity of the bonds, which is on average about five years in the euro area.

To conclude, non-financial corporate bond spreads in the euro area have been lower than what might have been expected given patterns in the short-term outlook for economic activity, but their alignment with other indicators of credit risk such as EDFs has become closer. It is notable that bank interest rate spreads on loans to large corporations, which had tracked corporate bond spreads relatively closely in 2003 and 2004, have begun to edge up over the past six months (see Section 4). Hence, some indicators point to risks of misaligned prices in the euro area corporate bond markets. A likely factor explaining this is the hunt for yield, as mentioned in the main text of this review. It cannot, however, be excluded that technical factors such as the possibilities for arbitrage opened up by the development of collateralised debt obligation markets might also have played a role in the (mis)pricing of euro area corporate bonds. Hence, these markets may be vulnerable to a reappraisal of credit risk premia in the period ahead, especially if volatility in equity markets were to return to longer-term historical averages.

Although funding costs in the euro corporate bond market have generally remained low and favourable, the issuance of bonds by non-financial corporations has remained subdued and demand from investors has been less receptive. This subdued bond issuance activity suggests that firms have been cautious about making real investments, and have instead been concentrating on ongoing efforts to reduce debt ratios.

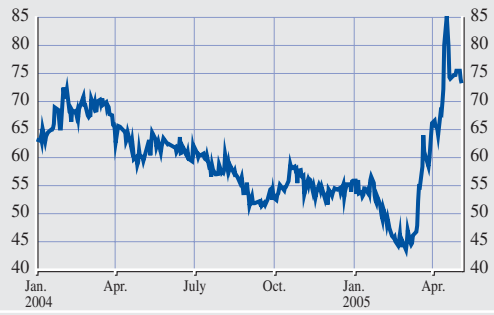
At the same time, however, Telecom Italia successfully managed to open the 50-year segment in the euro corporate bond market, just as the French Treasury had done in the government bond market several weeks before. In early March 2005 the company issued EUR 850 million of 50-year bonds, priced at about 100 basis points above the mid-swap rate prevailing at the time of issuance. By taking advantage of the apparently high demand for

very long-term bonds, Telecom Italia – which has a BBB+ S&P rating on its long-term obligations – thus managed to lock in long-term funding at an extremely low cost.

Finally, from a financial stability viewpoint, there have been reminders that credit events in the US can have important consequences for corporate bond market functioning in the euro area. Since March there has been a notable widening in the spread of yields on bonds issued by euro area non-financial corporations over yields on government bonds (see Chart 3.6), mainly reflecting concerns about financial strains at US automobile manufacturers. The events had an impact on the euro area corporate bond markets, especially in the low investment and speculative-grade segments, not least because some bonds issued by European subsidiaries of these firms are also included in euro area corporate bond indices.

Chart 3.6 Spread between yields on bonds issued by euro area non-financial corporations over government bond yields

(Jan. 2004 - May 2005, basis points)



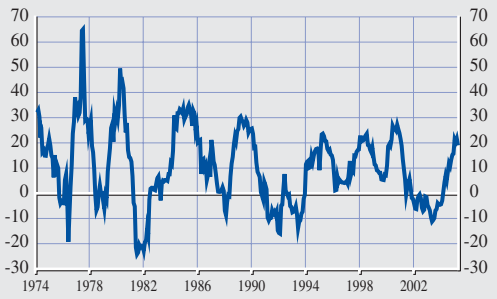
Source: Merrill Lynch.

EQUITY MARKETS

After November 2004, euro area stock prices continued to rise up to mid-April, reaching their highest levels since the summer of 2002 (see Chart S39). Stock prices benefited not only from the low levels of risk-free interest rates, but also from high reported earnings growth (see Chart 3.7). Similar to patterns seen in US equity markets, the share prices of so-called small and mid-cap companies enjoyed stronger performances than large cap stocks (see Box 5).

Chart 3.7 Earnings of stock market-listed companies in the euro area

(Jan. 1974 - Apr. 2005, % per annum)



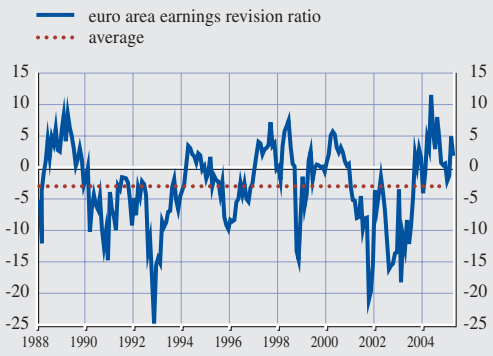
Source: Thomson Financial Datastream.
Note: Earnings calculated as the euro area stock price index divided by the price-earnings ratio.

Concerning risks to equity markets, some valuation metrics such as price-earnings (P/E) ratios have edged up over recent months (see Chart S40). While they still remain low relative to the peaks of 2000, a rise above longer-term historical averages always calls for cautious assessment, particularly because some risks may lie ahead. In particular, to the extent that equity market valuations are tied to developments in bond markets, a potential sudden upturn in long-term yields might not leave the equity markets unscathed. Furthermore, there is a possibility that the corporate earnings cycle may have peaked in early 2005. One indication of this is that upward revisions to 12-month ahead earnings expectations estimates declined relative to downward revisions after November 2004 (see Chart 3.8). Nevertheless, this stock market sentiment indicator remained positive and above its historical average.

To some extent, the expected deceleration in corporate earnings growth may have been tied to concerns about the possible adverse consequences of high and volatile oil prices for corporate earnings. In this respect, it is notable that the "earnings yield premium" in the euro

Chart 3.8 Earnings revisions ratio in the euro area

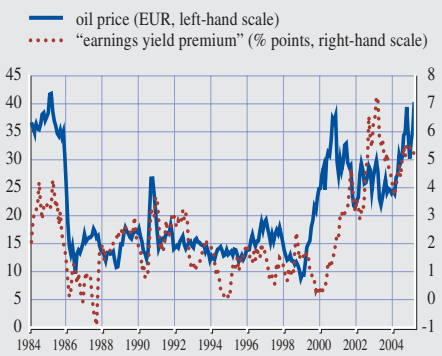
(Jan. 1988 - Apr. 2005, %)



Sources: Thomson Financial Datastream I/B/E/S and ECB calculations.
Note: The revisions ratio is the difference between the numbers of earnings estimates revised upwards and downwards as a proportion of the total number of earnings estimates.

Chart 3.9 Euro area "earnings yield premium" and oil price

(Jan. 1984 - Mar. 2005)



Sources: Thomson Financial Datastream and ECB calculations.
Note: The "earnings yield premium" is the difference between the earnings yield and the real long-term interest rate (nominal long-term interest rate minus actual CPI inflation).

area – the difference between the earnings yield and the (ex post) real long-term interest rate (the nominal long-term interest rate minus actual Consumer Price Index (CPI) inflation) – has generally co-moved with oil price developments over the last two decades (see Chart 3.9). This suggests that the appetite for investing in risky equity seems to be generally affected by oil price developments.

Implied volatility in the euro area equity markets remained low (see Chart S41). The factors underlining the low level of implied volatility in this market and other financial markets, as described in Box 3 of the December 2004 FSR, still seem to have prevailed.

Low implied stock price volatility appears to have made it easier for firms to issue fresh equity through secondary public offerings (SPOs), with issuance volumes reaching mid-2001 levels (see Chart S44). Issuance also continued to strengthen in the initial public offering (IPO) market.

4 THE EURO AREA BANKING SECTOR

4.1 FINANCIAL CONDITIONS IN THE BANKING SECTOR[1]

Continuing the pattern observed up to mid-2004, the overall financial conditions of large euro area banks improved further in the second half of 2004. Broadly speaking, the full year financial results for 2004 for these institutions showed improvements both in profitability and solvency compared with 2003.[2] This was encouraging overall, especially in some Member States where economic activity was slower than the euro area as a whole. In fact, information for some countries indicates that banking sectors weathered the slowdown better in comparison to previous slowdowns over the past decade.

Loans increased as a percentage of total assets in 2004, mainly reflecting high lending growth in those countries enjoying strong rates of economic growth. As mentioned in the December 2004 FSR, this loan growth was funded less from retail deposits and more from market-based sources, owing to the difficulty in attracting deposit funds at low retail interest rate levels. In particular, there were declines in deposits from non-MFIs in Member States in which credit growth was brisk. In terms of specific categories of credit, lending to households remained an important source of loan growth in several countries.

The decline in interest margins during 2002 and 2003, which was already noted in the December 2004 FSR, continued to weigh on net interest income developments in the second half of 2004. In fact, country-specific information suggests that interest rate margins reached extremely low levels in most countries. This led to declines in interest income for most institutions. Nevertheless, and more encouragingly, the decline in the level of interest income as a percentage of total assets appears to have slowed in some countries. To compensate for weakness in net interest income, banks sought to expand and develop non-interest income streams further – including fees and commissions as well as trading income. Country-level information suggests that these sources were relatively important in delivering improved profitability in 2004.

Costs declined slightly in the second half of 2004, contributing to improving profitability. Information from country-level sources points towards ongoing rationalisation of staff costs as being the main reason for the slight decline.

Individual country information indicates that provisioning for loan losses reached all-time lows in several euro area countries in 2004. The main factor explaining this was an improved credit risk environment, with banks facing declines in non-performing loans in most Member States. However, for one country with a more forward-looking provisioning system, provisions by banks for loan losses increased owing to substantial credit growth in recent years.

As for solvency, improvements were seen across the board with the least well capitalised institutions also enjoying improvements in solvency ratios. This left most euro area financial institutions relatively well capitalised at the beginning of 2005.

FINANCIAL CONDITIONS OF LARGE EURO AREA FINANCIAL INSTITUTIONS[3]

Profitability improved in 2004

The profitability of large euro area banks improved in 2004 compared with 2003. In some institutions, this was driven by sufficiently

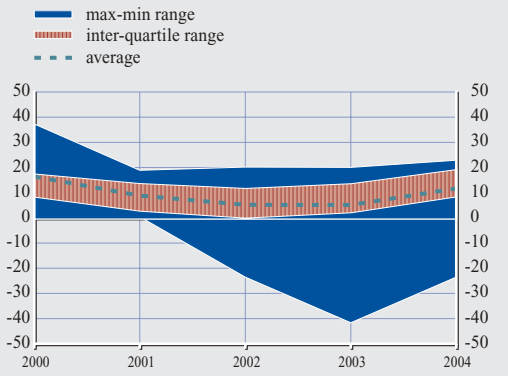
1 This Sub-section draws mostly on information collected by the Banking Supervision Committee (BSC) at the national level. It refers to 2004 as a whole and to conditions in individual countries' banking systems.

2 Considering information on a country level the only exception was Greece, where ROE was lower in 2004 (11.63%) than in 2003 (14.50%), due to increasing operating expenses and provisioning. The increase in expenses (voluntary retirement schemes, sectoral labour agreement and enlargement of the branch network) may not be prolonged into 2005.

3 This Sub-section draws on individual published financial statements of large financial institutions with their headquarters in the euro area.

Chart 4.1 Return on Equity (ROE) of large euro area banks

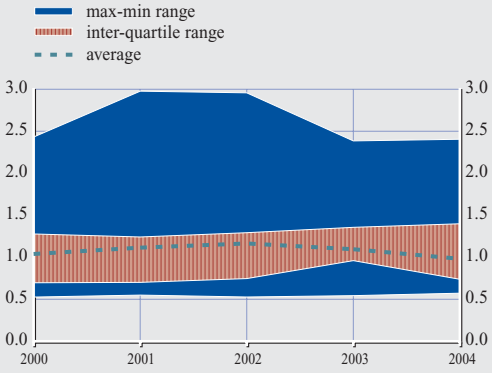
(2000 - 2004, %)



Sources: Bureau van Dijk (Bankscope) and ECB calculations based on annual data.

Chart 4.2 Net interest income of large euro area banks

(2000 - 2004, % of total assets)



Sources: Bureau van Dijk (Bankscope) and ECB calculations based on annual data.

strong volume growth in lending to offset reduced interest margins together with continued growth in non-interest income. The average return on equity (ROE) for the banks in the group increased significantly from about 5% in 2003 to just over 11% in 2004 (see Chart 4.1).[4] This notable improvement was due to a rebound in the performance of institutions located in one large Member State.

Although remaining relatively wide, the degree of dispersion of performances around the average ROE narrowed considerably in 2004. Nevertheless, some large institutions located in Member States where growth was slower than average still recorded negative ROEs resulting from exceptional restructuring charges and loan write-offs. This overall performance was not offset by the generally better performing operations of these institutions located in other euro area and EU Member States. By contrast, institutions located in Member States where economic growth was stronger than average, reported significant profit growth across most business lines.

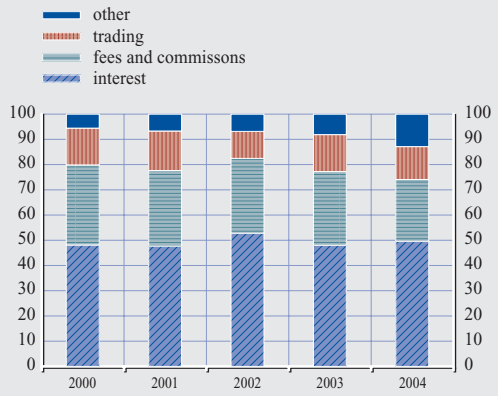
Turning to sources of income, the average net interest income of these banks, which had fallen in 2003, continued to decline as a percentage of total assets in 2004 (see Chart 4.2). Generally speaking, interest income declined across the euro area owing to narrow margins and a flattening of the market yield curve. The dispersion of performances was wide. Some institutions located in Member States where economic growth was strong generated strong interest income from increased volumes as well as strong growth across several business and geographic areas, including from countries located outside of the euro area. For some other institutions, the pace of decline in net interest income slowed, came to a halt or even reversed. Whether this reversal can be sustained will ultimately depend on the economic outlook.

Concerning sectoral lending, unconsolidated data for the entire euro area show that annual lending growth for housing related purposes continued to grow at a brisk pace of around 10% during 2004 and into early 2005 (see Chart S34). By contrast, lending to non-financial corporations grew at roughly half that rate, with a 5.2% year-on-year growth rate recorded at the end of 2004. Continued loan growth in some Member States, also contributed to the pressure on margins through the funding gap. As mentioned in the December 2004 FSR, the retail

4 All references to average values refer to weighted average values. Total assets are used to weight the variables unless otherwise stated.

Chart 4.3 Operating income of large euro area banks

(2000 - 2004, % total income)



Sources: Bureau van Dijk (Bankscope) and ECB calculations based on annual data.
Note: Data for individual banks are weighted by total assets. Some banks' accounts do not provide an adequate breakdown of figures and are therefore not included. Figures for 2004 are preliminary.

funding gap is the difference between loans granted to customers and deposits taken from customers. When this gap is positive, it means that banks have to fund their loan book through interbank funding or issuance of debt in the capital markets.[5] This tends to be more expensive compared with the cost of retail deposits, and thus contributes to the erosion of the interest margin between what a bank earns on loans and what it pays out on deposits, debt, or interbank funding.

For most of these large banks, there was continued pressure on net interest income – the most important contributor to bank profitability – which led these banks to focus on developing non-interest income sources. This included raising income from fees and commissions for a variety of businesses, as well as increasing income from trading and other activities. While developing non-interest income sources continues to remain an important part of these banks' strategies, the relative proportions of the various income components as a percentage of the total have remained fairly constant over time (see Chart 4.3). Among sources of non-interest income, fee and commission income remained the most important for large euro area banks, followed by income from trading activities.[6]

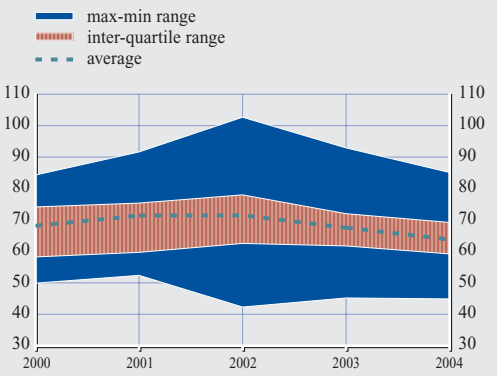
Cost-cutting continued

In light of the challenges faced by some banks to increase interest income, cost control remained a priority. As discussed in the December 2004 FSR, efforts directed at controlling costs contributed to increasing profitability in 2003, and a similar pattern was observed in 2004. The weighted average cost-to-income ratio of these large banks decreased from just over 67% in 2003 to about 66% in 2004 (see Chart 4.4). There were, however, substantial differences between the performance of institutions among those with lower cost-to-income ratios (lowest quartile) and those with higher ones (highest quartile), although the two have been converging since 2002. For institutions with the lowest cost-to-income ratios, cost-cutting was driven primarily by strictly controlling administrative and other expenses. On the other hand, institutions with the highest cost-to-income ratios cut costs principally by reducing staff numbers and by closing branches or restructuring certain operations.

5 For some institutions, securitisation is also a relatively important method of funding.
6 The figures concerning other income are influenced by one large institution in 2003 and, to a larger extent, in 2004. They are not indicative of any general trend.

Chart 4.4 Cost-to-income ratio of large euro area banks

(2000 - 2004, %)



Sources: Bureau van Dijk (Bankscope) and ECB calculations based on annual data.

Provisions were reduced further

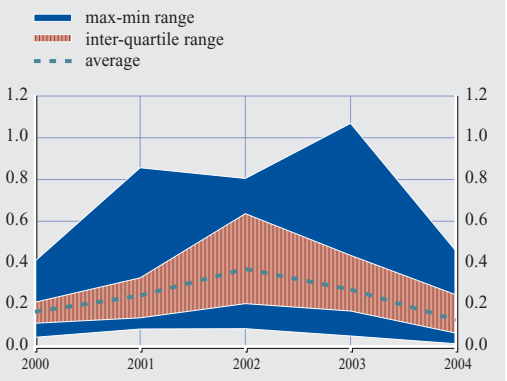
In addition to controlling costs, banks reduced provisions for loan losses markedly in 2004, following similar cuts in 2003. For the year as a whole, the flow of provisions was reduced to about 0.12% of total assets; just under half of the average of about 0.27% for 2003 (see Chart 4.5). Indeed, financial institutions' own commentary released with their financial statements pointed to provisions being at all-time lows in many cases. In addition, evidence from the ECB Bank Lending Survey points towards a further net easing of credit standards by banks in their lending to households in the first quarter of 2005 (see Box 10). This reflected three main factors. First, the net easing mirrored an overall improvement in the credit risk environment through a reduction in non-performing loans. Second, for some of the institutions in the sample, provisions were reduced on average from a relatively high base since 2002. Third, as suggested by patterns in the Bank Lending Survey, this may have reflected more prudent management and pricing of risk by institutions. However, this may also have reflected a certain amount of income smoothing by some institutions. Given the diversity in both operating environments and the financial results of the institutions, it is however difficult to disentangle the relative importance of each of these factors and the impact of institution-specific events on the overall improvement in provisioning. The level of provisions, although reflecting the current level of risk, may understate the level of forward-looking risk factors such as the level and volatility of oil prices as well as households' debt servicing ratios. Moreover, the pricing of credit risks in financial markets may have unduly influenced provisioning, especially because there are questions about the appropriateness of pricing in fixed income markets.

Solvency ratios increased for less capitalised institutions

The average Tier 1 ratio for these large institutions increased slightly to 8.3% in 2004 from 8.2% in 2003 (see Chart 4.6). Behind this, this key solvency ratio improved for those large institutions with the lowest Tier 1 ratios in the sample. Among the factors contributing to the improvement in capital ratios was the strength of profitability. For some banks, the restructuring of balance sheets by reducing risk-weighted assets also made a positive contribution.

Chart 4.5 Loan loss provisions of large euro area banks

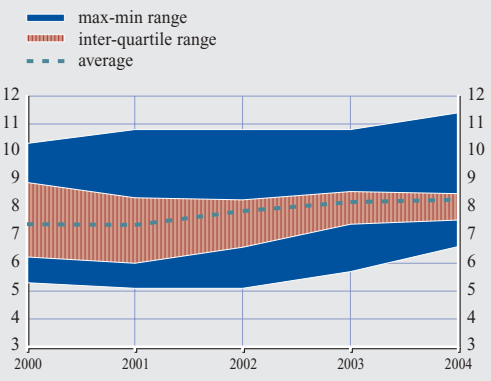
(2000 - 2004, % total assets)



Sources: Bureau van Dijk (Bankscope) and ECB calculations based on annual data.

Chart 4.6 Tier 1 ratio of large euro area banks

(2000 - 2004, %)



Sources: Bureau van Dijk (Bankscope) and ECB calculations based on annual data.

Box 10

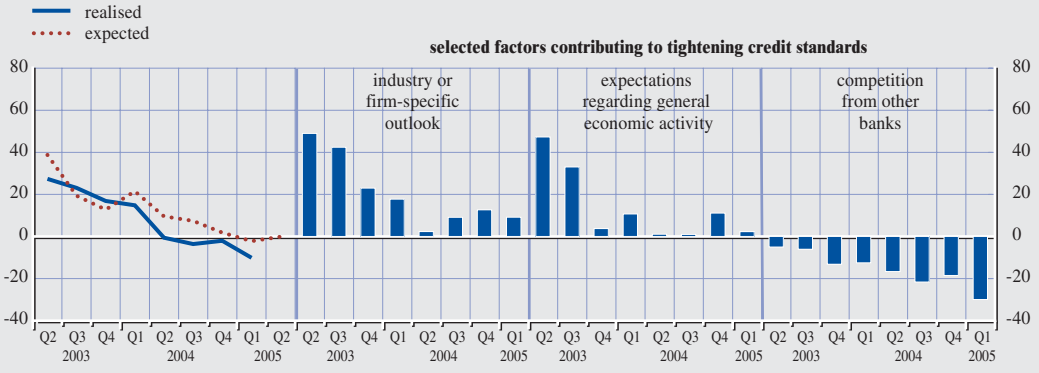
ASSESSING FINANCING CONDITIONS WITH THE ECB BANK LENDING SURVEY

The ECB's Bank Lending Survey provides important qualitative information on a timely and regular basis about banks' credit policies. By providing early indications of turning points in the credit cycle and potential credit crunches facing euro area households and firms, the survey constitutes a useful complementary source of information for assessing sources of risk and vulnerability to financial stability. With this perspective in mind, this Box examines recent developments – including the underlying driving factors – in banks' credit standards on the approval of loans to households and firms since late 2004, based on findings from the Bank Lending Survey.

According to the Bank Lending Survey, the pattern of net tightening of credit standards applied to the approval of loans to households and firms, which had been tapering off in earlier quarters, turned into a net easing over the past six months. In the first quarter of 2005, euro area banks reported a significant further relaxation of standards (i.e. the percentage of banks that reported an easing of credit standards compared with the previous period was larger than the percentage of banks reporting a tightening) for the approval of loans or credit lines to enterprises (see Chart B10.1). Competition from other banks was reported as being the most important factor in explaining this. By contrast, expectations regarding general economic activity as well as the industry and firm-specific outlook were seen by banks as factors for tightening credit standards. The principal way in which conditions and terms for the approval of loans or credit lines to enterprises were eased was through a decline in margins on average loans, more relaxed loan covenants and collateral requirements, as well as reductions in non-interest rate charges. By contrast, margins on riskier loans still contributed to a net tightening, suggesting that banks have recently become more discriminating in the pricing and treatment of risks.

Chart B10.1 Changes in credit standards applied to the approval of loans or credit lines to enterprises

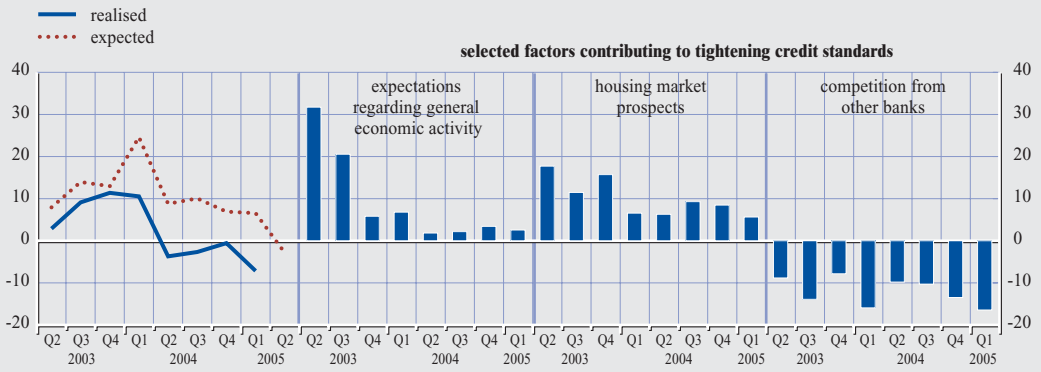
(net % of banks reporting a tightening of credit standards)



Source: ECB Bank Lending Survey.

Chart B10.2 Changes in credit standards applied to the approval of loans or credit lines to households for house purchase

(net % of banks reporting a tightening of credit standards)



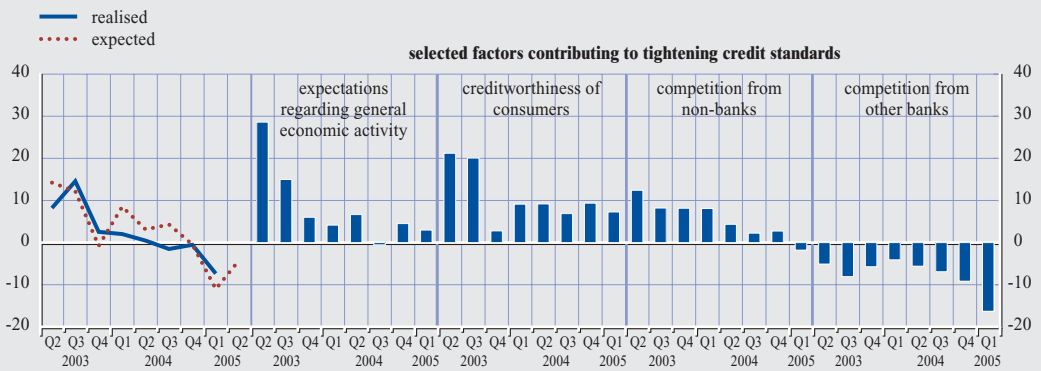
Source: ECB Bank Lending Survey.

A further net easing of credit standards was observed for the approval of loans to households for house purchase and for consumer credit in the first quarter of 2005 (see Charts B10.2 and B10.3). Competition from other banks was reported as being the most important factor behind the easier access of households to credit for house purchase. Expectations regarding general economic activity, housing market prospects (for loans for house purchase) and the perceived creditworthiness of borrowers (for consumer credit) were seen by banks as factors for tightening credit standards, as was the case throughout 2004. This too might indicate that banks have been persuaded to take on greater risk by supplying loans against a background of a deteriorating economic outlook. Whether or not lending institutions fully understand the risks involved and are pricing risks appropriately will only become evident in the event of, for example, a marked correction in the housing market (see Sub-section 2.2) or a slowdown in the pace of economic activity.

All in all, the Bank Lending Survey reveals that euro area banks have been gradually easing their credit standards over recent quarters. The offering of credit to households and firms with

Chart B10.3 Changes in credit standards applied to the approval of loans or credit lines on consumer credit and other loans to households

(net % of banks reporting a tightening of credit standards)



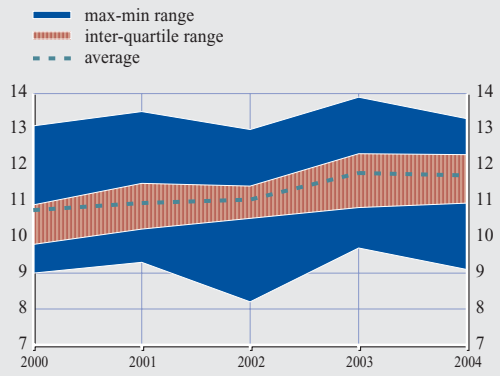
Source: ECB Bank Lending Survey.

easier terms against a background of intense competition from other banks on the one hand, and a somewhat deteriorating economic outlook on the other, suggests that banks have been adopting strategies of taking on greater risk in order to gain market share and boost profitability. Whether this is creating a basis for future difficulties – including a deterioration in the quality of banks' credit portfolios – will only become evident if the risk being built up actually materialises. This would call for close monitoring of these risks in the period ahead.

The average overall solvency ratio for large institutions remained essentially unchanged in 2004 compared with 2003. Similar to the Tier 1 ratio, the lower quartile institutions managed to improve the average overall solvency ratio from 10.8% in 2003 to 11.3% in 2004 (see Chart 4.7).

Chart 4.7 Total capital ratio of large euro area banks

(2000 - 2004, %)



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

4.2 RISKS FACING THE BANKING SECTOR

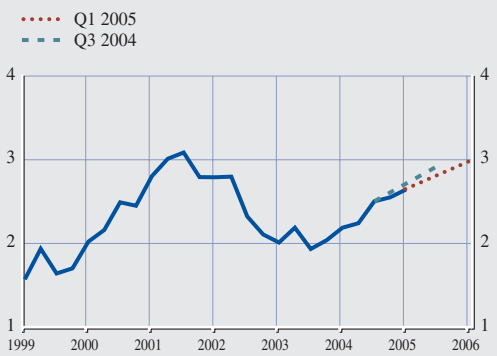
The outlook for the profitability of large banks seems favourable, given expectations that the recent slowdown in euro area growth will prove to be temporary, and with real GDP growth expected to return to rates in line with potential in the period ahead. In this vein, analysts' forecasts for banks' EPS envisage continuous improvement throughout 2005, although the most recent forecasts are slightly less optimistic than they were in the third quarter of 2004 (see Chart 4.8).

There are some sources of risk and vulnerability facing banks in the period ahead, notwithstanding the improved outlook for their financial condition. These sources remain similar to those highlighted in the December 2004 FSR. However, the likelihood that these risks could materialise in the near future, and therefore have an impact on the euro area banking sector, has potentially increased given the most recent developments in financial markets (in particular the sustained hunt for yield in high yield markets), as well as the decline in provisioning by large banks.

Turning to risks present within the euro area banking sector, some concerns remained in late 2004 about the existence of pockets of fragility where profitability had declined in 2003 from already low levels. However, profitability strengthened in 2004 in most countries, and most banking sectors, especially the weaker ones, recorded some improvement, thereby

Chart 4.8 Large euro area banks' earnings per share (EPS) and 12-month-ahead forecasts

(Q1 1999 - Q1 2006, weighted average, %)



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

somewhat easing these concerns. From this viewpoint, the robust performance of banks in 2004 may have allowed them to increase their capital and set aside buffers. However, the accompanying fall in provisioning, a common pattern across most of the euro area[7], could have affected large banking groups' ability to cope with the consequences of external shocks and may thus warrant close monitoring. Banks have justified these declines by pointing to satisfactory macroeconomic conditions in 2004 and expectations of favourable macroeconomic conditions in 2005. This means that any unexpected deterioration in the general economic outlook could leave banks exposed to the risk of diminished credit quality, for which they may not be fully prepared. Furthermore, regulatory changes, following the introduction of the IAS from the beginning of 2005, represent another source of uncertainty, as such changes may push banks into changing their current provisioning practices (see Box 11).[8] Additionally, liquidity risk may be a concern in certain banking sectors that have experienced much more rapid growth in lending than in deposit-taking.

7 One exception to this is Greece, where provisioning increased in 2004, driven by the combined effect of the following factors: (a) the policy of Greek banks and the Bank of Greece to maintain sufficient capital buffers to cover any potential future credit losses that could materialise in the event of an economic slowdown, (b) the cleaning up of the loan portfolios of a few banks, and (c) the increase in profitability, which provided an incentive to take advantage of the tax allowance up to 1% of loan provisions.

8 Given that under the IAS, provisions for general banking risk will not longer exist, banks will be allowed to increase provisions only on the basis of a detailed, and hence costly, presentation of the specific risks incurred.

Box 11

FINANCIAL STABILITY IMPLICATIONS OF THE NEW INTERNATIONAL FINANCIAL REPORTING STANDARDS

The International Financial Reporting Standards (IFRS) are the accounting rules issued by the International Accounting Standards Board (IASB). The policy discussion surrounding the IFRS has centred around the potential impacts on financial stability that could be both temporary and more permanent. This discussion has been particularly prominent in the EU given the adoption of Regulation (EC) No 1606/2002, which requires all listed European companies, including banks, to publish their consolidated financial statements in accordance with the IFRS from 1 January 2005 onwards. However, to ensure appropriate oversight, these standards need to be formally endorsed before they become legally binding in Europe. The EU endorsement process for accounting standards involves three stages:

Stage I: Proposal by the European Commission

The Commission identifies the specific accounting standard and submits it to the Accounting Regulatory Committee (ARC) with a proposal to either adopt or reject it. This proposal is accompanied by an analysis of the extent to which the standard conforms with the existing accounting directives as well as its suitability as a basis for financial reporting in Europe.

Stage II: Opinion of the ARC

The ARC is a regulatory Committee chaired by the Commission and composed of representatives of Member States. It has two months to deliver its opinion on the proposal to the Commission. The ARC is purely an advisory group and receives technical advice from European Financial Reporting Advisory Group (EFRAG).

EFRAG is a private sector forum composed by the main parties interested in financial reporting in Europe, namely the users, those preparing standards, and the accountancy profession, which will advise on the technical assessment of the IASB standards and will provide an interpretation regarding their application in Europe.

Stage III: The Commission decides whether or not to adopt the standard

If the ARC supports the proposal to adopt a standard, the Commission will take the necessary measures to ensure that the standard is adopted for use within the EU's legal environment. If the ARC does not have an opinion or delivers a negative opinion, the Commission might return the issue to EFRAG or bring the matter before the European Council.

Perhaps the most significant impact of IFRS will be the fair value valuation of assets and liabilities that have not been traded, such as derivatives. Notwithstanding uncertainty over measurements of fair value when no ready market for certain assets or liabilities exist, issues with a stability dimension largely relate to the potential for higher income volatility, most notably:
– Derivatives will be measured at fair value and included on the balance sheet.
– All dealing and most investment securities held by banks will be measured at fair value.
– Banks are expected to consolidate a great number of special purpose vehicles. All business combinations will be accounted for as acquisitions. Goodwill amortisation will cease, and annual impairment tests will be introduced instead.
– Numbers traditionally regarded as exceptional, such as restructuring costs and gains and losses on trading assets, will increasingly be regarded as part of operating performance.

As is the case for many of these items, the likely impact on the volatility of reported income will at the same time also increase the understanding of investors and analysts concerning the true extent of banks' exposure to risk.

The new standards may also change banks' behaviour, and especially their risk management practices. The new reporting standards could cause concern over risk-taking if the impact on the accounts becomes less clear. In this respect, the uncertainty created by the transition may also have consequences for financial stability, most notably:
– Reserves for credit losses will be affected by the introduction of a new provisioning methodology. At the same time, the fund for general banking reserves will be reclassified as equity.
– Banks will need to review their hedging strategies and make changes to their systems and hedging documentation.
– The recognition of unrecognised actuarial losses on pension obligations may result in a decrease in equity and the reclassification of certain capital instruments from equity to liabilities.
– The overall level of provisioning allowed under the new regulatory regime will in general be smaller, as the IFRS no longer allow provisions for general banking risk.

To understand the implications of these changes better, many countries are presently undertaking impact studies. In parallel, some banks have already begun to communicate to investors what they see as the likely impact of the changes in accounting standards.

Turning to sources of risk arising from outside the banking sector, the major concern remains credit risk and interest rate risk, both on the banking and trading books. Banks are exposed to interest rate risk directly through their trading and investment positions, and indirectly through the possible impact on credit risk of any unforeseen interest rate hikes. Although preliminary information does not indicate a broad-based increase in risk-taking by banks (indeed, at least some banks seem to have reduced their fixed income positions), indirect effects, when materialised via an increase in credit risk, cannot be so easily dismissed. Concerning corporate sector credit risk, as discussed in Section 2, vulnerability does not appear to lie with large firms, which have on the whole benefited from deleveraging and improved profitability.[9] However, insolvencies among SMEs, even if their volume remains broadly stable, warrants close monitoring as the number has remained high. As for the household sector, indebtedness has continued to grow, mostly but not exclusively for housing purposes, and in some countries there has been a shift from fixed to floating rate mortgages. However, there is little indication that households are encountering problems in servicing their debts at prevailing interest rates, although it remains to be seen whether household balance sheets would prove resilient to an unexpected upturn in interest rates.

Nonetheless, adverse macroeconomic conditions or an unexpectedly rapid increase in long-term interest rates could weaken banks' positions in their investment and trading books and reduce the quality of their loan portfolio.

CREDIT RISK EXPOSURES

Corporate asset quality risks

Notwithstanding less favourable economic developments in some large euro area countries throughout the second half of 2004, the overall quality of the banks' commercial loan portfolios has not markedly deteriorated over the last six months. However, tight competition among credit institutions in many euro area countries could have contributed to keeping banks' margins from loans to the corporate sector at low levels.

The balance sheet positions of large euro area corporates continued to improve in the second half of 2004. On the other hand, the situation in the SME sector, where banks typically have substantial exposures, remains difficult and has actually worsened in many Member States. From the banking sector point of view, it is nevertheless notable that despite the continuing high level of corporate insolvencies in the euro area, the increasing concentration of insolvencies among smaller companies means that banks' loan loss volumes actually decreased between 2003 and 2004. Taking a longer-term perspective might, however, produce a less sanguine view on the banks' credit risk outlook, as the smallest companies tend to account for a large share of employment in the economy.

The overall rather sluggish demand for bank loans by the euro area corporate sector – against the background of very favourable financing conditions – could become problematic for those banks that rely on corporate clients as a particularly important source of revenue. Especially in those euro area countries where economic growth has remained relatively buoyant, banks may not have been able to increase their exposures in areas where profitable investment opportunities exist. As discussed in more detail in Section 2, corporate sector balance sheets have generally become less leveraged which, together with increased corporate sector profitability, is a sign that the conditions for internal funding have improved.

A notable development has been that while euro area corporate bond spreads continued to fall in late 2004 and in early 2005, bank lending spreads first increased and later on broadly

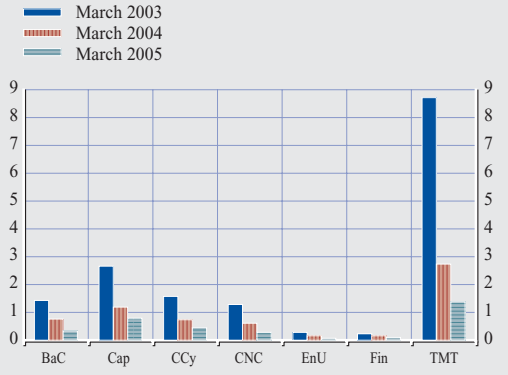
9 Deleveraging was not the case for Irish or Finnish corporates; in the latter case, the level of corporate leverage has already reached exceptionally low levels.

stabilised over the last six months or so (see Chart S65). This would suggest that banks perceive the credit risks of large corporations to be less benign than the risks being priced in by market participants. Spreads on small loans have also been increasing, although at a more moderate pace.

Compared with the situation reported in the December 2004 FSR, euro area authorities reported no significant changes in banks' exposures to aggregate industries. Given that the median EDFs for the seven major aggregate industrial sectors (basic materials and construction; capital goods; consumer cyclicals; consumer non-cyclicals; energy and utilities; financial; and technology and telecommunications) have declined rather markedly, banks' exposures at risk (expressed as the banks'exposures multiplied by the median sectoral EDFs) are likely to have decreased as well. This suggests that the credit risks to the euro area banking sector that originate from these aggregate sectors have continued to decline. Despite this rather positive development, exposures to sectors that are typically more vulnerable to high oil prices, such as airlines and tourism, could yet generate credit losses for banks (see Chart 4.9).

Chart 4.9 Expected default frequency for different euro area industrial sectors

(medians)



Source: Moody's KMV.
Note: The sectors are 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).

Regarding specific sub-sectors, the risks for banks from the commercial real estate sector remain high in those countries where real estate prices have increased substantially and where banks have material exposures. However, there continue to be substantial differences in commercial real estate market developments across Member States. In at least one large country, banks' direct real estate loan exposures produced a further increase in credit risk, as commercial real estate prices continued to decline from already subdued levels. Apart from the direct credit losses from loans not being repaid by insolvent borrowers, declining commercial real estate prices could have further adverse consequences owing to the frequent use of such assets as collateral for other loans. However, risks from falling collateral values are unlikely to materialise as long as borrowers are capable of generating sufficient cash flow to repay their debts – which should, in general, remain the case unless the macroeconomic environment were to unexpectedly deteriorate.

A new development in the relationship between euro area banks and their commercial real estate borrowers – which could be partly related to banks' preparations for the new Basel II capital requirements – has been the rapid expansion of business by distressed loan portfolio investors. In some countries, such investors have been aiming at purchasing substantial parts of the amounts of non-performing real estate loans. From a financial stability perspective, the emergence of a market for distressed loans in the euro area commercial real estate sector is to be welcomed as a positive development. Specialised distressed loan investors tend to enhance the transparency of credit risk pricing and increase the banks' flexibility in handling credit risk. Moreover, the transfer of distressed assets to specialised entities allows the banking sector to take advantage of economies of scale in dealing with such assets.

Mortgage lending-related risks

The share of mortgage lending to total lending to households is large. Although lending for house purchase tends to be well collateralised

and is therefore a relatively low-risk business for banks, it cannot be excluded that risk-taking by euro area banks could have increased, given the rapid increases in mortgage lending in most euro area countries in 2004 in an environment of uncertainty regarding future economic growth. Moreover, in the medium term, the solvency of borrowers could deteriorate if the disparity between the trend in property prices and in disposable income were to persist over the foreseeable future. At the same time, intensified competition among banks in the mortgage lending market could have resulted in a deterioration in the credit quality of new borrowers.

Concerning the ways in which banks have been managing the risks associated with mortgage lending, setting up adequate credit standards for new mortgages is an important factor insulating banks from risks of rising defaults. While average loan-to-value (LTV) ratios of the euro area mortgage lending stock have increased rather slowly – with large differences in the ratios applied across individual countries – LTV ratios for new mortgages have tended to increase rather substantially, reaching 100% or more in some countries. The adjustment of interest rates in mortgage contracts also affects the distribution of risks between banks and their customers in the event of changing market interest rates. The share of variable-rate contracts among new mortgages has been increasing, which may reflect responses by households to the prolonged period of very low levels of short-term interest rates. An increasing share of variable rate loans would, at least in the short term, strengthen the resilience of banks' net interest income in the event of higher interest rates. However, the potential deterioration of the credit portfolio – if households' debt servicing capacity were to be unexpectedly and seriously impaired – could have a negative impact on banks' profitability and solvency. Loan periods for newly extended mortgages have also been substantially lengthened in some countries. Finally, fierce competition in the mortgage lending market has depressed euro area banks' interest rate margins.

Overall, however, despite an increase in household indebtedness, declining collateral requirements and risks of higher long-term interest rates in the medium term, credit risks for banks arising from households in the euro area should remain contained. This is also true given the somewhat different pace of increase in mortgage lending volumes in different parts of the euro area. If they were to materialise, however, risks associated with lending for house purchase would affect a source of banks' overall income that has proven to be significant over recent years.

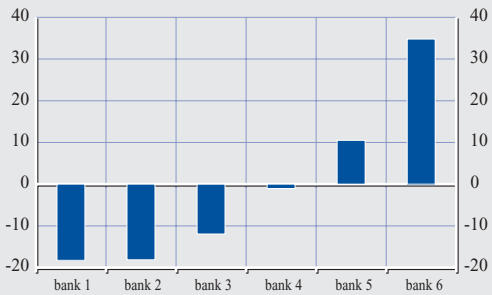
MARKET-RELATED RISKS

Banks are exposed to market risk through different channels: they have direct exposures to interest rates and exchange rates, as well as to emerging market economies, and indirect exposures to financial institutions that are active in the markets, such as hedge funds.

One frequently used indicator for gauging market risk is the total value at risk (VaR), and changes in this indicator over time can provide information on whether banks have increased their market risk-taking. For those euro area banks which disclose information on this indicator, changes in 2004 compared with the previous year do not point to a uniform pattern in changes in risk-taking (see Chart 4.10).

Chart 4.10 Changes in total Value at Risk (VaR) for individual banks

(Dec. 2003 - Dec. 2004, % change)



Source: Financial disclosures of banks.

Interest rate risk

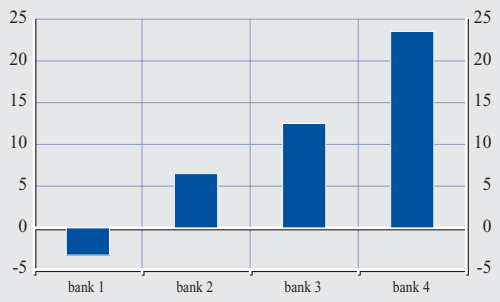
As discussed in Section 3, the risk that long-term interest rates could rise abruptly in the period ahead has been priced into long-term interest rate options. Banks may be exposed to this risk either directly, as discussed in this section, or indirectly through a deterioration in credit risk.

Concerning the direct consequences of interest changes, an important channel is banks' trading books. There are some indications that certain banks have increased their risk-taking in a search for yield by increasing their exposure to alternative interest rate instruments, such as emerging market economy and corporate bond markets, which can be categorised as speculative. Because of this, in the event of an unexpectedly large or rapid surge in global interest rates or a substantial increase in risk aversion, a large-scale and disorderly unwinding of positions on illiquid markets could result in substantial trading book losses for banks with exposures to these asset classes.

Nonetheless, patterns of market risk-taking differ across countries: for example, interest rate VaR readings increased in 2004 in Greece, remained unchanged in France and even declined slightly in the Netherlands (in the second half of 2004). Nonetheless, information on a small sample of euro area banks for which information on interest rate VaRs (approximated by fixed income VaRs) is available indicates that some large banks increased their exposure to this type of market risk in 2004 (see Chart 4.11).

Chart 4.11 Changes in interest rate Value at Risk (VaR) for individual banks

(Dec. 2003 - Dec. 2004, % change)



Source: Financial disclosures of banks.

It is important to bear in mind that low or declining volatility depresses VaR values, so that even unchanged readings for this yardstick may indicate an increase in risk-taking when such developments in volatility occur. In this light, the declining and historically low level of volatility in the euro area government bond market (see Chart 3.5) may indicate an increase in the interest rate risk embedded in broadly constant fixed income VaRs. In countries where VaR figures are not available, some information on market risk can be gauged from changes in own fund requirements for market risk. This increased in 2004 in a few cases (namely Portugal and Austria). However, it is important to bear in mind that both VaR and own fund requirements for market risk values tend to be modest relative to banks' capital.

Potential losses for banks deriving from any upturn in long-term interest rates could also go beyond the narrowly defined market risk arising from positions in the trading book and stem from holdings of fixed income instruments, either on banking or trading books. Given that the relevance of this type of risk varies substantially across euro area banking sectors, generalisations should be avoided, but for the handful of banking sectors where fixed income holdings are large, banks may be particularly vulnerable to interest rate increases.

In general, however, the direct exposures of banks to interest rate risk are likely to be significantly smaller than indirect exposures which come through credit risk in the banking book (see Box 12). More broadly, given the nature of banks' business, i.e. to collect deposits and grant loans, the amplification of interest rate changes through their effect on loan quality is bound to remain the most relevant manifestation of interest rate risk. In fact, although an increase in long-term interest rates would benefit banks by raising their lending margins, the deterioration in credit quality, and, to a lesser extent, the losses on securities holdings by banks, could outweigh any immediate benefits.

Box 12

MEASURING THE INTEREST RATE RISK OF EURO AREA BANKS USING AN ASSET PRICING MODEL

Banks are exposed to interest rate risk through a number of channels, some of which are offsetting. For instance, an increase in interest rates can have a direct and positive effect on banks' expected net interest income whereas it can adversely affect the value of their fixed income holdings. In addition, by influencing the broad economic environment, changes in interest rates can also have indirect effects on banks. On one hand, higher interest rates can have a negative impact on banks' credit quality and non-interest income. On the other hand, higher rates can also signal expectations of an economic upswing with positive future implications for the banking sector. This Box assesses changes in the interest rate risk of a selection of euro area banks by means of a method which makes use of the fact that banks' equity prices contain information about their long-term outlook for profitability.

The standard Capital Asset Pricing Model (CAPM) model – a model which facilitates the decomposition of stock returns according to different risk factors – can be augmented with interest rate variables.[1] Although this approach is not a substitute for position or duration analysis (which allow for higher precision in the estimation of direct interest rate risks faced by banks) earlier studies using the CAPM approach have found that overall banks' stock returns tend to be negatively related to changes in interest rates. This suggests that higher interest rates have a predominantly unfavourable effect on the expected future profitability of banks. However, some analyses suggest that this relationship could be time-varying; in particular, there are indications that banks' interest rate sensitivity could have declined after the mid-1990s.[2]

For the current analysis, an aggregated measure of interest rate risk was constructed by applying a simple empirical model based on these insights to the weekly stock returns of a panel of 40 large banks located in the euro area.[3] The standard estimation method adopted in the literature consists of two steps. The first step is to generate a measure of unanticipated interest rate changes.[4] Since market interest rates and stock market returns tend to be correlated (multicollinearity), the second step is to estimate this correlation. Following this, a decomposition can be achieved which separates the total sensitivity of banks' stock returns to unexpected changes in interest rates that are due to direct effects (the direct relationship between the bank's stock return and interest rate variables) from changes caused by indirect effects (i.e. those that come through the market index return, which is a proxy for the broad economic environment).

1 For one of the first descriptions of this framework, see W. F. Sharpe (1964), "Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk", *Journal of Finance,* Vol. 19, No 3, pp. 425-42.

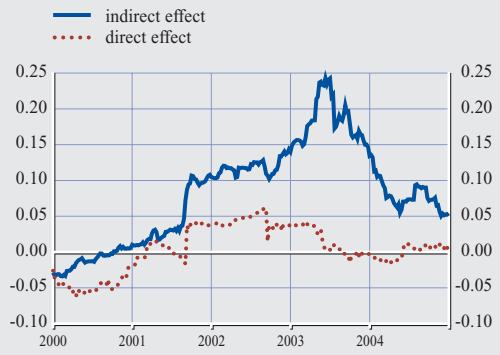
2 Among others, see M. J. Flannery and C. M. James (1984), "Market Evidence on the Effective Maturity of Bank Assets and Liabilities", *Journal of Money, Credit and Banking,* Vol. 16. No 4, pp. 435-45; E. Dinenis and S. K. Staikouras (1998), "Interest Rate Changes and Common Stock Returns of Financial Institutions: Evidence from the UK", *European Journal of Finance,* Vol. 4, No 2, pp. 113-27. The time variance of the relationship has been analysed for instance by W. Bessler and H. Opfer (2004), "Multi-Factor-Asset Pricing Models for German Stocks: An Empirical Analysis of Time Varying Parameters", Center for Finance and Banking, Justus-Liebig-University, Giessen.

3 The following equation was estimated: $R_b - r_f = \beta_0 + \beta_m * R_m + \beta_i * \Delta(I) + \eta$, where R_b = weekly banks' stock returns, r_f = the short term money market rate, R_m = weekly return of Dow Jones EURO STOXX 500 and $\Delta(I)$ = the weekly change of the interest rate variable.

4 While there are many ways to do this, the standard approach in the literature is to base interest rate expectations on a simple auto-regression model, which is the approach taken here.

Chart B12.1 52 week rolling coefficients measuring sensitivity of banks' stock returns to one-year yields

(%)



Source: ECB calculations.

The term spread (for measuring changes in the market yield curve slope), the one-year zero coupon yield (for measuring shifts in the yield curve) as well as ten-year zero coupon yields were all individually considered as the interest rate variable in the estimations. As an example, Chart B12.1 shows estimates, computed on a rolling 52 week basis, of the direct and indirect sensitivity of equally-weighted aggregate bank stock returns to changes in one-year (euro) zero coupon yields.

Table B12.1 shows the estimation results for a sequence of short samples (one year) together with findings for the whole sample period (January 1999 to December 2004). The coefficients represent the sensitivity of weekly returns to a 1 percentage point increase in the three different interest rate variables.

The estimated coefficients reveal that the indirect effect, measured by the product of the market beta – the correlation between the return of the market index and the return of the bank index – and the market return sensitivity on interest rate changes, is dominant in explaining euro area banks' stock returns. One possible explanation for this finding is that the proportion of banks' net income that is sensitive to economic cycles (e.g. non-interest income) has increased over the sample period. Indeed, in the sample considered here, those banks with a higher share of non-interest income in total income exhibited higher indirect coefficients. The signs of the indirect coefficients are positive for most of the estimation period, suggesting that higher interest rates were interpreted positively for future banking sector profitablity.

Apart from some of the sub-periods, the coefficients measuring the impact of direct effects of interest rate changes remained close to zero.[5] There are at least two potential explanations for why the direct effects appear negligible. First, this could have reflected a growing use of interest rate derivatives designed to limit banks' exposures to interest rate risk. Second, due to low earnings from maturity transformation (resulting from narrow spreads between long-term

5 This low level of sensitivity to direct effects could also lend some support to previous studies that have analysed the degree of time variation.

Table B12.1 Direct and indirect sensitivity of banks' stock returns on interest rates for different samples

(%)

sample period	Δ (10y-1y)		Δ (1y)		Δ (10y)	
	direct	indirect	direct	indirect	direct	indirect
Jan. 1999 - Dec. 2004	-0.024	-0.008	0.018	0.075	-0.009	0.055
Jan. 1999 - Dec. 1999	-0.007	-0.044	-0.024	-0.031	-0.014	-0.035
Jan. 2000 - Dec. 2000	0.024	-0.007	-0.022	0.005	0.007	0.003
Jan. 2001 - Dec. 2001	-0.061	-0.061	0.037	0.108	-0.048	0.071
Jan. 2002 - Dec. 2002	-0.035	0.063	0.036	0.143	0.001	0.205
Jan. 2003 - Dec. 2003	-0.013	0.138	-0.003	0.147	-0.010	0.122
Jan. 2004 - Dec. 2004	-0.016	0.033	0.006	0.052	-0.004	0.048

Source: ECB calculations.

and short-term interest rates), banks may have attempted to minimise maturity mismatches in their banking books.

Overall, considering the period between 1999 and 2004, interest rates seem to have played an important, albeit time-varying, role in explaining banks' stock returns. While the direct effects were moderate, the coefficients for the indirect effects tend to be more important, highlighting the sensitivity of banks' expected income to the general economic outlook. The relatively low level of direct sensitivity of banks' stock returns to changes in interest rates may have reflected improvements in the ability of banks to mitigate their open positions by using off-balance sheet instruments or on-balance sheet hedging (via demand deposits). Looking ahead, should the share of demand deposits in banks' funding decline further, banks' direct exposures to interest rate risk may increase; this would provide additional incentives for the use of derivatives.

Hedge fund-related risks

After early 2003, inflows into hedge funds began to increase at a brisk pace, and this continued in the second half of 2004. Given that the prime brokerage business in particular remains one of the most profitable and promising areas for many banks, faced with insufficient growth in other revenue sources, relationships with hedge funds could constitute not only a source of counterparty risk but also an indirect market risk for banks. The CSFB/Tremont Hedge Fund Index increased by 9.6% in 2004, providing some reassurance that, on average, direct credit risks – for instance, arising from the possibility of hedge fund failures – for banks were not sizeable. Nonetheless, certain strategies, such as convertible arbitrage, could have suffered from low levels of volatility in the equity markets. However, concerns have begun to increase about the possibility of so-called crowding of trades, which could amplify the market risks facing banks in times of stress (see Box 2).

There are indications that competition among prime brokers has been very intense and that more recent entrants into the business, including some euro area banks, may have found the dominance in this business of US entities somewhat challenging. Available information indicates that owing to tight competition, the terms and conditions on bank credit have become more favourable for hedge funds. The practices where hedge funds require prime brokers to commit to stable margin terms for a defined period of time do lower the liquidity risks facing hedge funds, but also increase the potential future credit risk for prime brokers. Moreover, in order to remain competitive, prime brokers have been increasingly offering VaR-based margining or margin offsets based on past correlations of positions. Such practices necessitate the enforceability of netting arrangements in the event of default, especially if services to hedge funds are provided by different companies of a wider banking group.

Concerning risk management, the use of stress-testing has become more common among prime brokers, although the robustness of systems to events such as turbulent market conditions – when liquidity could evaporate in many fledgling markets let alone more established ones – still remains untested.

With regard to transparency, even the largest hedge funds remain opaque to the general public: according to one market report[10], at least one-third of hedge funds do not report data to any commercial hedge fund database. Moreover, large hedge funds prefer to use multiple prime brokers, which raises concerns about the ability of prime brokers to monitor their potential future risks deriving from exposures to hedge funds.

10 See Strategic Financial Solutions (2004), "Database Study".

Foreign exchange risk

In the past six months, there has been no significant change in the direct exposure of banks to exchange rate risk, and in some cases this exposure has even fallen (e.g. in Greece and the Netherlands). Banks' open foreign exchange positions have in general remained low, both in absolute terms and as a share of regulatory own funds: banks seem, in fact, to have hedged the largest part of their exposure to this risk.[11] Moreover, there is little evidence of currency mismatches between the asset and liability sides of euro area bank balance sheets, and banks seem to have continued to adjust their asset and liability positions denominated in foreign currency (usually the US dollar) to benefit from a possible further strengthening of the euro (see Chart S54).

Nevertheless, internationally active banks, in particular those with branches or subsidiaries in the US, might not only be exposed to currency risk via unhedged currency mismatches, but also by translating currency changes on the balance sheets of subsidiaries recorded in other currencies into euro.[12]

Banks can also be exposed to foreign exchange risk indirectly through changes in the competitiveness of euro area non-financial firms. Moreover, indirect effects would impact not only banks with open positions in foreign currencies, but in general all banks whose borrowers' credit quality could suffer because of a loss of competitiveness. So far there has been little sign that the strengthening of the euro has translated into balance sheet problems for firms. However, it cannot be excluded that an unexpected and prolonged period of volatility in the euro exchange rate, possibly connected with a correction in global imbalances and associated adjustments in consumption in deficit countries, could prove problematic for banks.

Risks stemming from emerging market exposures

For emerging market economies (EMEs), as discussed in Section 1, the main downside risks include the possibility of a disorderly correction of global imbalances, a sharp upturn in oil prices, as well as borrowers' vulnerability to a sharper than expected upturn in mature economy interest rates. Insofar as the euro area is concerned, available evidence suggests that euro area banks' exposures to risks arising in the EME international bond market might be relatively contained (see Table S3). There are indications that among industrial countries, overall holdings of securities issued by EMEs have recently fallen (see Chart S7). However, the hunt for yield has contributed to a narrowing of spreads on EME bonds to such an extent that a correction in risk premia cannot be excluded. Should this happen, pockets of vulnerability may be exposed in some institutions with more significant risk-taking in these markets.

Benign macroeconomic developments in Latin America have eased earlier concerns of risks arising from investments in the local bond markets. Advanced negotiations on the restructuring of Argentina's defaulted debt in particular 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. At the same time, the fact that the largest exposures of euro area banks in Latin America remain concentrated in more stable local markets, such as Mexico and Brazil, indicates that the cost of their loss on Argentine debt may be contained on average (see Chart S57 and Table S3).

Exposures of euro area banks to selected markets in Asia remained fairly similar to the ones reported in the December 2004 FSR, apart from a noticeable reduction in exposures to Thailand (see Chart S58 and Table S3).

11 For instance, in Germany large banks are almost completely hedged against foreign exchange risk.

12 In particular, in the first half of 2004, some French groups were affected by the appreciation of the USD/EUR.

RISKS STEMMING FROM LINKS BETWEEN EURO-AREA BANKS AND THE NEW EU MEMBER STATES (EU10)

The banking sectors of many of the new EU Member States (EU10) are characterised by a substantial presence of and ownership by euro area institutions. Because of this ownership structure, developments in the EU10 banking sectors contribute directly to the profitability and the risk-taking of euro area banks.[13]

Over the past years, those euro area banks that are active in the EU10 have benefited from rather high profits yielded by their subsidiaries. This is primarily due to the acceleration of credit growth in many EU10 countries, where ratios of credit to the private sector were previously at rather low levels. This remained the case in 2004, when the profitability of EU10 banks was generally strong, with higher levels of ROE than in the previous year (ranging between 13% and 23%), and with the majority of countries registering an overall level of ROE above 16%. Similar to developments in the euro area banking sectors, and to some extent also on the grounds of common business strategies through the aforementioned ownership links, the increase in profitability was driven by increases in non-interest income and a reduction in provisions. While the question on the adequacy of provisions can be extended from the euro area to the EU10 banks, the issue, in particular for mortgages, is more complex, given the relatively new and rapid extension of credit by EU10 banks to the household sector for housing purposes. However, the lack of a sufficiently long credit history in these countries does not favour domestically-owned banks over euro area-owned banks; rather, it is a general systemic feature of the local markets caused by the relatively recent start of extensive household sector lending in these countries. At the same time, there are indications that foreign-owned banks in the EU10 tend to keep higher provisions, so that risks stemming from an underpricing of risks in these markets for the parent banks in the euro area may be lower than average.

Other sources of risk for euro area banks stemming from their investment in the EU10 mirror those of their domestic market to the extent that rapid lending growth, especially to the household sector, in the majority of the EU10 could expose banks to heightened credit risk. However, the generally low loan-to-value ratios for households in the EU10 may make direct credit risks manageable for banks, given the very low starting point at the beginning of the present cycle.

In addition, exchange rates are a source of risk for euro area banks that are active in the EU10. Although in general the direct foreign exchange exposures of EU10 banks are small, indirect exposures could be a source of weakness. In fact, currency mismatches on the balance sheets of firms may pose a credit risk for banks. Loans can be denominated not only in euro but also in Swiss francs and Japanese yen, while the earnings of the borrowers are typically in local currency. Such mismatches could present a potential source of vulnerability for euro area banks with considerable stakes in EU10 banks. Nonetheless, even for those euro area banking sectors that are more significantly exposed to the EU10 markets, overall exposures are rather small as a share of total domestic banking assets or regulatory capital.

4.3 SHOCK ABSORPTION CAPACITY OF THE BANKING SECTOR

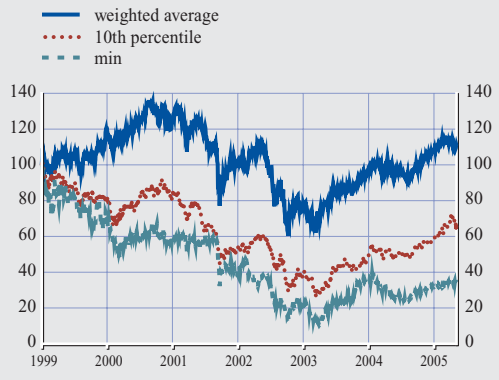
MARKET-BASED INDICATORS

Market-based indicators generally suggest that optimism about the banking sector's earnings prospects has improved over the past six months and, notwithstanding the risks described above, there are few concerns among market participants about the resilience of euro area banks. The messages sent by such market-based indicators should, however, always be

13 For a more detailed description of developments in the EU10 banking sectors, see Section 1; this Sub-section restricts analysis to the consequences of such developments for euro area banks.

Chart 4.12 Dow Jones EURO STOXX bank index

(Jan. 1999 - May 2005, index Jan. 1999 = 100)



Source: Bloomberg.

interpreted with caution, particularly given indications of mispricing in some segments of the fixed income market referred to elsewhere in this review.

Concerning banks' stock prices, the Dow Jones EURO STOXX bank index rose by more than 8% since November 2004, outperforming the broader stock market even after a slight downturn initiated in April 2005. This recent moderation was consistent with the slightly less optimistic view among analysts regarding future earnings developments in Q1 2005 compared to Q3 2004 (see Chart 4.8). The rise in bank stock prices up to April was broadly based and included the least-well performing banks (see Chart 4.12).

The price-earnings (P/E) ratios – a valuation metric but also an indicator of expected future earnings growth – of large euro area banks has risen over the past six months, pointing to optimistic views among investors (see Chart S63). To some extent, this improvement can also be traced to perceptions of low risks confronting the sector, indicated for instance by very low implied volatility of bank stock prices (see Box 13 and Chart S64).

Box 13

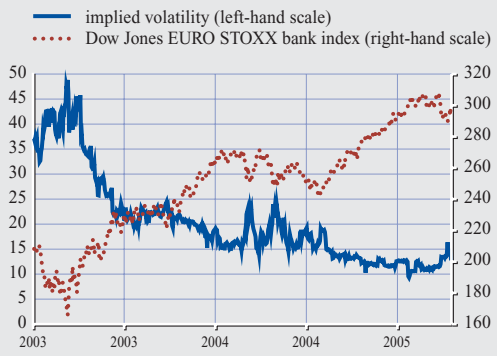
OPTIONS-BASED INDICATORS OF FUTURE RISKS IN EURO AREA BANK STOCK PRICES

In assessing financial stability, central banks use a wide range of tools to monitor the risks of financial institutions. Timely indicators – such as expected default frequencies (EDFs) and distances to default (DDs) – can be extracted from the prices of financial assets. Bank stock prices in particular reflect market participants' views on the future earnings prospects of banks by discounting future dividends. EDFs and DDs in turn provide an assessment of the probability of banks experiencing financial distress (see Box 14). Compared to these indicators, option prices convey complementary information about the uncertainty perceived by market participants.[1] By incorporating the market's assessment of the expected future volatility of the asset price over the lifetime of the option, the observed prices of options provide additional information that goes beyond the expected average value contained in the stock price. This Box describes how information on uncertainty about future banking sector performance can be gauged from option prices.

Options are derivatives contracts that provide investors with the right but not the obligation to buy or sell the underlying asset at a predetermined price (the strike price) at a predetermined future date (the option's maturity date). From an option quote, it is possible to infer the

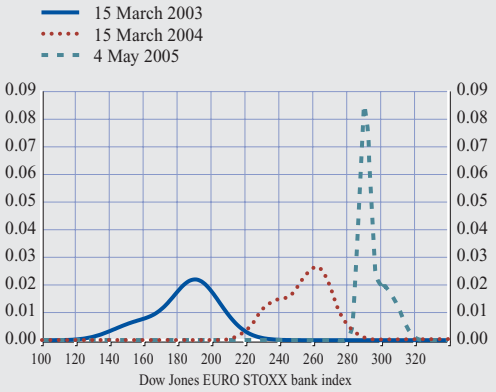
1 Although EDFs and DDs are conceptually based on option theory, these indicators do not incorporate any information on traded options.

Chart B13.1 Dow Jones EURO STOXX bank index and its implied volatility



Source: Bloomberg.

Chart B13.2 Risk-neutral probability density function of the future euro area bank stock index



Sources: Bloomberg and ECB calculations.

expected volatility, or implied volatility, by inverting the Black and Scholes pricing formula.[2] Chart B13.1 plots the Dow Jones EURO STOXX banking sector index against its implied volatility.[3] After the recovery of the euro area stock markets started in March 2003, the market's perception about the future evolution of the Dow Jones EURO STOXX banking index changed significantly. Moreover, the upturn of the bank stock price index was accompanied by a continuous decline in implied volatility. A possible interpretation is that investors became less concerned about the risks of future sharp fluctuations in the index as the value of the stock index recovered.

The forward-looking perspective of risks in the euro area banking sector may also be broadened by analysing the risk-neutral probability density functions (PDFs) of the future value of the Dow Jones EURO STOXX banking index. This options-based indicator conveys information about both the future values of the stock index expected by market participants – revealed by the range of strike prices – and the probability attached to this expected value. Therefore, the PDF can concisely illustrate different scenarios priced in by financial markets.[4] In particular, it facilitates analysis of whether risks are viewed as symmetric or concentrated in a specific direction, i.e. towards an increase or a decrease in the stock price over the option's time to maturity. For example, less market uncertainty as captured by lower implied volatility tends to be reflected in a narrowing of the probability density distribution. A change in the market's assessment of the future directional risks of the stock price would, in turn, result in a change in skewness of the distribution function, with a higher risk of near-term gain (loss) in the stock index translating into rightward (leftward) skewness on the function. Given these

2 See F. Black and M. Scholes (1973), "The Pricing of Options and Corporate Liabilities", *Journal of Political Economy,* Vol. 81, No 3, pp. 637-54.

3 The chart plots the implied volatility of at-the-money options on the Dow Jones EURO STOXX banking index. This is the average volatility of call and put options, the strike price of which is equal to the value of the futures contract price for the first month maturity. Due to the greater liquidity of the options market for the narrower index comprising 48 banks, the broader index including 69 banks was not considered for this analysis.

4 The technique used here assumes an *a priori* shape for the PDF – a mixture of two lognormal distributions – which is sufficiently flexible to account for the distribution of the future asset prices implicit in option prices. The estimation consists in recovering the empirical PDF that produces option prices as close as possible to the observed market option prices. See W. R. Melick and C. P. Thomas (1997), "Recovering an Asset's Implied PDF from Option Prices: An application to Crude Oil during the Gulf Crisis", *Journal of Financial and Quantitative Analysis,* Vol. 32, No 1, pp. 91-115.

considerations, the PDF can be particularly valuable in identifying the risks, as perceived by market participants, of large changes in the outlook for the euro area banking sector over a given horizon.

Chart B13.2 plots PDFs for the Dow Jones EURO STOXX banking index on three dates, beginning with March 2003, when risks in the banking sector were considered to be rather high. The reduction in implied volatility throughout the sample period is reflected by a compression of the PDFs over time. The perceived direction of risks also changed over the period. In March 2003 the risk of a large decrease in the stock index was assigned a much higher probability than the risk of an increase of the same magnitude, as reflected by a relatively thicker left-hand tail of the curve. One year later, stock prices had risen and the asymmetry of risks had decreased significantly; and by May 2005 the PDF displayed a higher probability of positive variations in the stock index than of negative variations. The overall reduction in left-hand skewness, together with the compression of the PDF, suggest that participants in the options market have become increasingly confident of a benign outlook for the euro area banking sector, in line with the recovery in their share prices and improved financial results reported by many banks in 2004.

Overall, therefore, measures based on option prices to gauge risks in the banking sector can provide useful complimentary information. Recent developments in these indicators tend to suggest that, by early May 2005, the outlook for euro area banks had improved considerably when compared with March 2003. However, since the methodologies for estimating these indicators are subject to several caveats, the results should be interpreted with caution.

The distance to default (DD) – another equity market-based yardstick of banking sector risk – is an important forward-looking indicator that can provide early signs of financial fragility (see Box 14). The median DD of the set of large euro area banks continued to increase from an already high level in November 2004 (see Chart S60), moving further away from a possible default point. The EDF, a closely related indicator, has further declined over the last six months, corroborating the view that the euro area banking sector is more resilient (see Chart S59). A particularly encouraging sign was the sharp fall in the EDFs of the weakest performing set of banks over the second half of 2004.

Developments in these market indicators are also consistent with patterns in more direct measures of credit risk of euro area banks. Credit default swap spreads on senior and subordinated debt remained essentially unchanged at the very low levels reached between September 2004 and March 2005 (see Chart S61). Towards the end of March 2005, however, the spreads increased mainly in response to the financial strains among some large US corporate bond issuers in the automobile sector (see also Sub-section 3.2). Though spread increases were contained, there are some grounds for caution in assessing the information content of recent developments in these spreads, as their tightening may be another manifestation of the search for yield which has characterised fixed income markets since mid-2003.

Box 14

DISTANCE TO DEFAULT AS A MEASURE OF BANKING SECTOR FRAGILITY

In making financial stability assessments, market indicators can complement traditional analysis of balance sheet indicators. As market indicators are based on securities prices which themselves contain the collective expectations of numerous market participants regarding the underlying fundamentals governing valuations, they are a potentially rich and comprehensive source of information, and have the important advantage of being forward-looking. If market participants take sufficient account of risks and vulnerabilities, such indicators can shed light on perceptions of the robustness of the financial system. Furthermore, their availability at very high frequencies facilitates continuous assessment. Nevertheless, it is important to bear in mind that the potential for securities prices to depart from the underlying fundamentals calls for caution: analysis of market-based indicators should not be a substitute for formal balance sheet analysis. This Box examines the indicator properties of the so-called distance to default, a market-based indicator which provides a quantitative measure that can provide early indications of financial distress and fragility.[1]

The distance to default provides a measure of the distance – in asset value standard deviations – of the current market value of assets in a company from a specified default point. It is derived using information on the market value of assets, a pre-specified default point and the uncertainty of the market value of assets, and represents a yardstick of business risk. In the absence of information on the market value of assets, the value of equity and debt in the company are typically used as proxies. When calculating the distance to default, one of the main assumptions is that the company is expected to honour in full its debt obligations to bondholders when the debt matures. If the obligation is not met, then the bondholders take over the company and the shareholders receive nothing. It is further assumed that the shareholders of the company would choose to refuse to meet the obligations of the company if its assets were to be valued less than its debt. If, on the other hand, the value of the company's assets exceeds the value of debt, the shareholders can choose to pay the debt and retain ownership rights over the assets. Intuitively, therefore, the equity of a company can be modelled as a call option on the assets of the company.[2] Given this relationship, it is possible to make use of the Black-Scholes option pricing model to derive the level and volatility of the market value of assets from the observed market value of equity, volatility of equity and debt.[3] The value of equity is reflected by the company's stock price, while the debt figures can be obtained from public accounts.

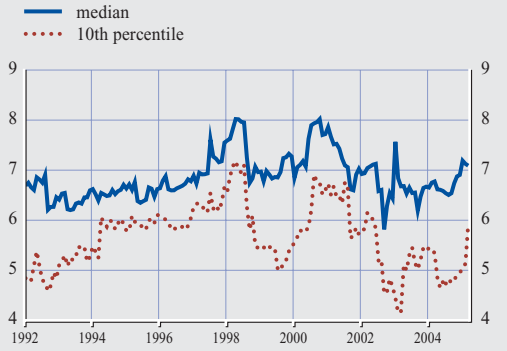
The distance to default is derived as the difference between the current market value of assets and the default point, scaled by the volatility of the asset value. The market value of assets is a measure of the expected future cash flow from the assets in the company, while the volatility can be used to measure how uncertain this cash flow is. An increasing valuation of the assets in a company, reflected through increasing stock prices, will thus increase the distance to default

1 See R. Gropp, J. Vesala and G. Vulpes, "Equity and Bond Market Signals as Leading Indicators of Bank Fragility", *Journal of Money, Credit and Banking,* Forthcoming.
2 See R. Merton (1974), "An Analytical Derivation of the Cost of Deposit Insurance and Loan Guarantees", *Journal of Banking and Finance,* 1, pp. 3-11.
3 See Black and Scholes, ibid.

for the company. Underlying a higher distance to default could also be decreasing volatility because of lower levels of uncertainty about the value of assets.

The distance to default can be estimated for non-financial and financial institutions. When assessing the risks in the euro area banking sector, the distance to default for the largest banks in the euro area can provide some useful information. Chart B14.1 illustrates patterns in the distance to default for a group of large euro area banks since 1992. This long time series makes it possible to see how the measure reacts in periods of financial distress. The distance to default for the analysed banks decreased significantly in 1998 at the time of the Russian crisis and the near-collapse of LTCM. It also declined in 2002 because of general uncertainty in the financial markets about the implications of various high-profile accounting scandals. Banks with the lowest distance to default reacted more strongly than the average.

Chart B14.1 Distance to default for large euro area banks



Sources: Moody's KMV and ECB calculations.

REVIEW OF RATING ACTIONS AND CREDIT QUALITY OUTLOOK BROADLY POSITIVE

The three major international rating agencies concur that the ratings of Europe's largest banking groups continued to ease throughout 2004, confirming the positive trend in credit quality. According to Moody's, the upgrade-to-downgrade ratio rose to 2, from a ratio of 0.5 in 2003. This positive trend was mainly driven by two factors: earnings growth and strict cost discipline on the part of European banks.

According to the three major rating agencies, the ratings outlook for European banks through 2005 is expected to remain stable. However, banks' performance will be driven by economic trends. Although a gradual recovery in the euro area economy is anticipated in 2005 and in 2006, the picture varies from country to country. External factors will continue to influence the performance of the banking sector, such as the behaviour of interest rates and the housing market, the potential threat of geopolitical factors (such as a terrorist attack), and the level of consumer confidence.

4.4 OVERALL ASSESSMENT

The improvement already underway in euro area banks' financial conditions in the first half of 2004 gathered further momentum in the second half of 2004 and in early 2005. Profitability and solvency measures both improved. However, increased profitability was partly the result of a marked reduction in provisioning, which constitutes a factor of greater vulnerability for banks in the case of adverse developments in the financial markets or with regard to economic growth. It is also worth noting that the share of banks' net interest in total income continued to decline, mainly owing to reduced margins. Banks managed to compensate for narrow interest margins by increasing lending volumes in those countries with a more favourable macroeconomic environment, and by turning to alternative sources of non-interest income or cost-cutting in other parts of the euro area.

The current signs of resilience in the euro area banking sector notwithstanding, the major risk factors currently identified could yet expose

banks to various sources of credit risks. Apart from the potential for negative surprises from the global macroeconomic environment, protracted high energy prices and the risk of higher market interest rates could also exert considerable stress on euro area corporate sector borrowers, particularly among SMEs and the more energy-intensive sectors. Moreover, in an environment of already low demand for corporate credit, banks have become increasingly dependent on income derived from mortgage lending activity. Continued weakness in the commercial real estate sector in some large countries may further impair banks' resilience. In this respect, the gradual emergence of a market for distressed loans in some euro area countries is a development that may positively contribute to banking sector stability.

Concerning market risks, the potential that interest rates could increase from their current very low levels also exposes euro area banks to the risk of direct losses, although these are likely to be significantly smaller than the indirect effects materialising via credit risk. The need to generate revenue from non-interest sources may have urged some banks to extend their search for yield, either directly, through investment in higher-yielding but also riskier markets, or indirectly, for instance by acting as prime brokers to hedge funds. In this context, the first signs of a widening in credit spreads for emerging market and corporate sector bonds could herald increasing interest rate risk for banks. Changes in VaR readings indicate that in the second half of 2004, banks generally increased their exposure to interest rate risk, although such measures do not paint a uniform picture, as different banks seem to have changed their exposures to different market segments.

Looking forward, market indicators currently signal little cause for concern regarding euro area banks' prospects for future earnings or the resilience of the sector as a whole. Banks' stock prices have not only increased since November 2004, but have also outperformed the broader stock market, reflecting a positive assessment of banks' generally strong performance in 2004. Rising share prices have also been associated with lowered uncertainty – as gauged by implied volatility – and a decline in EDFs. At the same time, since the forward-looking characteristics of the financial markets imply that the risks identified in this review should be priced into these indicators, it would appear that the risks are currently assessed as being manageable for banks.

5 OTHER EURO AREA FINANCIAL INSTITUTIONS

In the euro area insurance industry, following the recovery in profitability that characterised the sector in 2003, a further improvement in profitability is expected in 2004. However, there were differences in performance across sub-sectors of the industry.

5.1 FINANCIAL CONDITIONS IN THE INSURANCE SECTOR

There have been indications that financial performance improved in the euro area insurance industry in 2004 thanks to increased investment income, which has been primarily driven by favourable developments in the stock markets.[1] The strength of equity markets benefited companies in the non-life insurance sector more than companies in the life insurance sector, the difference reflecting the traditionally higher asset allocation by non-life insurers to equities. As the corollary of this significantly lower holding of bonds, the investment incomes of non-life insurers were less affected by persistently low interest rate rates.

For the non-life insurance sector, there are indications that improvements in the core premium-writing business have also contributed favourably to profits. Premium income in the life insurance industry has benefited somewhat from improvements in the net worth of euro area households. The ongoing consolidation of the industry, coupled with the emergence of large and more diversified players, may have contributed to maintaining some underwriting discipline in favouring competition via product differentiation. However, despite the strengthened influence of important groups on pricing, competition from price-cutting has continued to exert downward pressures on premium prices in the euro area.

For life insurers, the profitability of the underwriting business was more modest, owing to the low level of financial attractiveness of traditional life policies, whose guaranteed returns have decreased in most euro area countries. Despite the buoyant recovery in sales of unit-linked products, the growth of sales did not reach the high levels seen during the equity bull market of the late 1990s. Moreover, greater competition resulting from a gradual increase in business distributed through the bancassurance channel rather than traditional channels has also contributed to lower profit margins in the euro area life insurance industry.

In the euro area reinsurance sector, there were indications of higher profits in 2004 and improving capital positions, thereby enhancing the resilience of the industry to adverse disturbances. Although in mid-2004 excess capacity and strong earnings growth had raised some concerns that the reinsurance sector might be faced with sharp drops in premium prices, this risk did not materialise.[2] The high frequency of natural disasters in the second half of the year and the associated sizeable amounts of claims to be paid has weighed on the capacity of the reinsurance market, notably in the US, so that overall premium prices only decreased modestly in 2004 as a whole (see Chart 5.1). Despite the global nature of the reinsurance market, there have been some indications that euro area reinsurance companies have managed to limit margin compression to a greater extent than their competitors located in Bermuda and in the US.

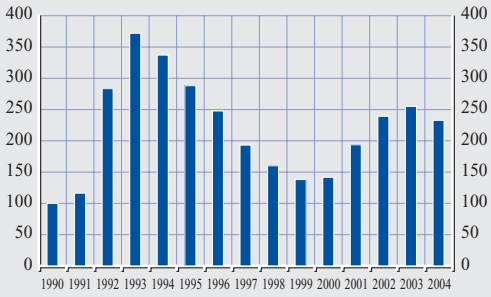
Three key factors can be identified that may explain differences in pricing between euro area and US reinsurance firms, and the subsequent differences in financial results. First, euro area reinsurance companies tend to have more diversified portfolios than their US

1 See Committee of European Insurance and Occupational Pensions (2005), "Report on Financial Conditions and Financial Stability in the Insurance Sector, the Occupational Pension Fund Sector and the Reinsurance Sector", CEIOPS Committee on Financial Stability, February.

2 Pricing is de facto cyclical in the reinsurance market, increasing after major catastrophes and decreasing after extended periods when no major events have occurred, often to levels not always beneficial for reinsurance companies.

Chart 5.1 World reinsurance prices

(1990 - 2004, index: 1990 = 100, rate on line)



Source: Guy Carpenter & Company, Inc.
Note: Rate on line is the premium divided by indemnity.

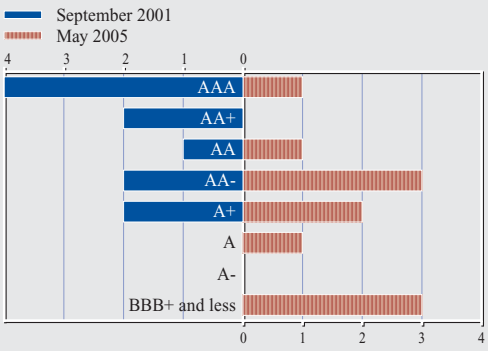
counterparts. Because of this, they suffered less from sizeable hurricane-related losses in 2004, and their financial strength ratings have been better. This characteristic has proven important, since it has allowed euro area reinsurers to avoid the "flight to quality" that typically arises after major catastrophes on the part of primary insurers, which tend to prefer reinsurers with comfortable capital positions and, thus, lower credit risk. Second, downward pressures on premium prices arise as a result of capital overcapacity. Unlike in the US, reinsurers located in Bermuda have not succeeded in increasing their market share in the euro area, and the entry of hedge funds into the euro area reinsurance industry has remained insignificant. Third, new capital brought to the industry through the issuance of catastrophe bonds by euro area reinsurers has remained rather limited and was insufficient to place downward pressures on premium prices (see Box 15).

Box 15

THE REINSURANCE MARKET AND CATASTROPHE BONDS

The balance sheets and creditworthiness of reinsurance companies are highly sensitive to catastrophic events such as natural disasters or terrorist attacks. In particular, the events of 11 September 2001 in the US were followed by substantial credit rating downgrades of all euro area reinsurance companies and, by May 2005, these assessments had not yet been fully reversed (see Chart B15.1) These reactions suggest that reinsurance might not be the most efficient way to handle losses from extremely large and infrequent events. After a major catastrophic event, capacity constraints in the reinsurance market tend to exert upward

Chart B15.1 S&P ratings of major euro area reinsurers



Source: Standard and Poor's.

Chart B15.2 Cat-bonds issued and outstanding

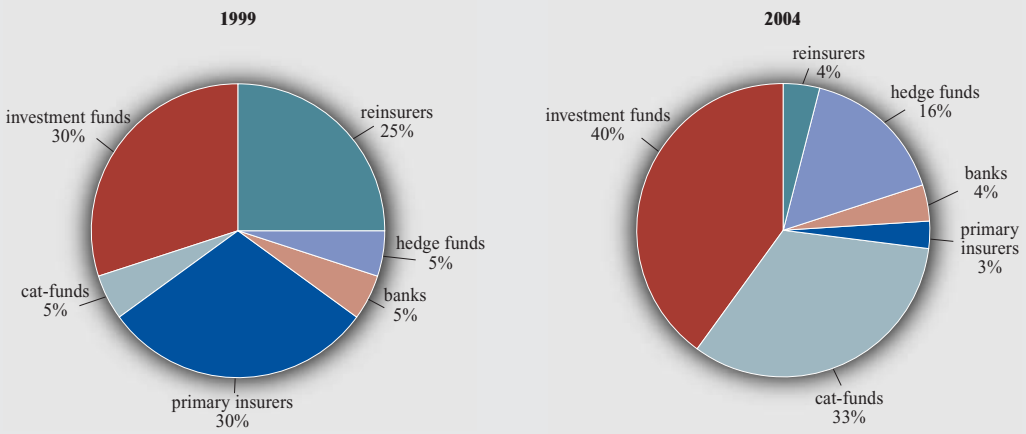
(USD million)

Source: Swiss Re.

pressure on reinsurance premia. The capacity of the international reinsurance market is currently estimated to fall within a range of USD 125-150 billion. As most of this capital is set aside to back insurers' liabilities arising from more frequent events that are covered by the vast majority of insurance contracts, the capacity looks rather limited compared to the large losses that are often incurred as a result of catastrophic events – nearly USD 50 billion in insured losses was incurred in 2004 alone. This Box analyses features of the market for so-called catastrophe bonds (henceforth "cat-bonds"), a financial innovation of the mid-1990s designed to transfer part of the risk associated with catastrophes from the reinsurance sector to the capital markets.

In a typical cat-bond contract, the primary insurer enters a reinsurance agreement with a special purpose vehicle (SPV) that is specially created for the transaction. The SPV, which is a legal entity created to hold the capital raised from investors, issues cat-bonds to capital market investors up to a specified limit. The proceeds from the sales of the bonds, which are used to compensate the primary insurer should a loss event occur, are deposited in a trust company and invested in securities carrying a high credit rating. Hence, as cat-bonds are fully collateralised, the associated credit risk is close to zero. This characteristic may prove especially attractive for primary insurers, as they do not incur the risk that their reinsurer could face financial distress in the event of a large loss, thereby creating the risk of non-payment on a claim. By contrast to traditional reinsurance contracts, cat-bonds use mechanistic and transparent triggers for paying claims, and the typical term of coverage spans between three and five years, compared with the usual one year of reinsurance contracts. If no triggering event occurs during this period, investors receive their principal back at maturity and benefit from a higher coupon than what is offered by similarly rated corporate bonds. Should a loss event occur, the funds are used to make payments to the primary insurers, leading to partial or complete loss for the investors. To date, none of the approximately 45 cat-bonds known to have been issued has been triggered.

Chart B15.3 Buyers of cat-bonds



Source: Swiss Re.

Some ten years since the inception of the cat-bond market, more than USD 8 billion in bonds has been issued by a relatively limited number of issuers (see Chart B15.2). Among the factors limiting the issuance of cat-bonds is that such instruments may appear expensive, despite the absence of credit risk, as well as the observed fall in prices since the first transactions. In addition, compared to traditional re-insurance contracts, they are also more time-consuming to issue. However, cat-bonds are attractive for investors as they offer returns that show very low correlation with other financial securities. They are therefore very well suited for the diversification of portfolio risk. The increasing participation of hedge funds in recent years appears to be one manifestation of this (see Chart B15.3).

However, the increasing interest shown by hedge funds in the reinsurance business raises more general questions from a financial stability viewpoint. Due to the large size/low frequency nature of catastrophic events, reinsurance companies must typically take a very long-term view in order to smooth losses over long periods of time. In the absence of significant barriers to entry, the emergence of new players in the market who aim at exploiting the positive phases of the cycle (typically soon after large events have occurred) and often exit when a negative phase sets in, could change the nature of the market. Increasing competition would put downward pressure on premia, potentially forcing incumbent firms to adopt more short-term strategies as well, and possibly undermining the industry's capacity to provide sufficient coverage in the event of large losses. To avoid such adverse contingencies, a further deepening of the cat-bond market could be a welcome development. Spreading the peak risks to investors would ease the potential strains on the capital position of reinsurers that arise in the wake of major catastrophes. This appears all the more important as the reinsurance business is very concentrated and typically dominated by a few large institutions. Given the role of reinsurers as the insurers of last resort, their financial health is crucial to safeguard the stability of the entire industry.

Hence, the risk of a lack of discipline in the underwriting business that can arise when prices decline beyond levels that threaten sustained core business profitability has been avoided in the euro area. This is especially important given an environment of very low interest rates, as insurance companies derive their income from both underwriting and investment. As reinsurance companies have faced challenges in generating sufficiently strong investment returns to compensate for potential unprofitable core underwriting business, the orderly and contained decline in premium prices has been important.

Regarding the assessment of the solvency position of euro area insurers, two methods may currently be used. The impact of the decline of yields in the second half of 2004 appears very different depending on which approach is adopted. According to the traditional approach, solvency positions should have improved because of rising market values of bond holdings on the asset side. By contrast, using market interest rates to value liabilities, the fall in yields produces a deterioration in the financial condition of the insurance sector by raising the net present value of future liabilities.

5.2 RISKS FACING THE INSURANCE SECTOR

Notwithstanding the improvement in the financial conditions of the euro area insurance industry since 2003, sources of vulnerability remain in the period ahead. Risks stemming from the insurance industry itself are essentially related to a possible accelerating decline in premium prices from non-life and reinsurance companies and to the implementation of new international accounting standards. To a lesser extent, the challenges associated with increasing

life expectancies, the so-called longevity risk, may continue to weigh on future profits. Risks arising from outside the insurance sector are mainly associated with market risks – interest rate as well as equity risk.

The main source of risk within the insurance sector that may affect profitability is the risk of a sharp decline in premium prices. Both reinsurance firms and non-life insurers may be faced with incentives to lower premium prices in order to gain market share. However, the risk of accelerating downward pressure on prices towards levels no longer technically profitable appears to be less pronounced in the euro area than in the rest of the world. European insurers may benefit from a flight to quality that typically characterises phases of declining premium prices in the reinsurance market. Indeed, they can offer considerable capacity and stronger financial strength ratings compared to their competitors. Furthermore, their more diversified books increase their resilience to decreasing prices in some business lines. Finally, were the low interest rates that have prevented companies from generating significant returns on their invested assets to persist in the period ahead, further pressure would be put on insurance companies to maintain underwriting discipline in order to achieve acceptable returns.

For the insurance sector as a whole, a short-term risk is related to ambiguities in financial disclosure practices during the implementation phase of the IFRS. The fact that during the transitory period between 2005 and 2007 assets can be valued on a mark-to-market basis whereas liabilities can still be valued on the traditional basis carries the risk of asset-liability mismatches in accounting that could generate volatility in earnings and financial reporting. The risk of a permanent rise in the cost of capital resulting from increased earnings volatility is perceived by the insurance industry as a possible adverse consequence of the implementation of the new accounting standards. Indeed, before 2005 the liabilities were not mark-to-market, so that profits and losses related to market fluctuations did not have an impact on the capital position of insurers.

Accounting uncertainty could also have broader consequences for financial stability, as insurers may become more inclined to pass investment risks on to policyholders by offering more unit-linked products or contracts with less guarantees and bonuses. Such changes would constitute a transfer of risks from insurance companies to policyholders, with households bearing as a result more financial and longevity risk than in the past. As some of the diversifiable risks that were previously eliminated by the pooling of individual risks will re-emerge from these transfers, the level of risk-sharing in the economy may well be reduced.

The introduction of mark-to-market accounting rules may also encourage insurance companies to shorten their business planning horizons. Increased focus on business with short pay-back periods to limit volatility in net income and in earnings may reduce the appetite of reinsurers to bear the costs from infrequent but severe loss events. The insurance business essentially has a long-term horizon: life insurance companies collect long-term savings for retirement funding purposes, while non-life reinsurers absorb losses arising from natural disasters or terrorist attacks over long periods of time. The shortening of planned horizons may weigh on insurance companies' willingness and ability to diversify risks over time.

Finally, the transition to a mark-to-market system in the insurance sector will tend to homogenise accounting standards and thus risk management practices, not only internationally but also across financial institutions. As a result, all insurance companies will be forced to update their risk management models, which will be beneficial from a financial stability viewpoint. However, the regulatory changes also imply that in order to meet their regulatory capital positions, all institutions will tend to

react in a similar manner to changes in market prices, so that more risks will be valued, traded and hedged in the same way.[3] The subsequent reduction in the diversity of risk management practices could thus contribute to increased systemic risk in periods of financial market distress.

Regarding risks outside the insurance industry, the low interest rate environment, especially the decline in long-term yields during the second half of 2004 in the euro area, continued to pose challenges for those life insurance companies that had sold policies with high guaranteed returns. Although the level of guaranteed returns has already declined in most euro area countries, the large volume of outstanding policies that were sold in the past with high guaranteed returns will continue to weigh on profits until the existing portfolio of policies has matured.

Some euro area life insurers significantly increased their bond holdings throughout 2004. These portfolio reallocations were aimed at adjusting balance sheet risks in the context of impending implementation of the new market-based accounting standards. This also favoured the issuance of very long-dated bonds by some Treasuries in the euro area. However, the gap between the duration of assets and liabilities remains negative, exposing firms to interest rate risks. As life insurers hold a non-negligible proportion of their fixed income securities in US Treasury bonds, they are also exposed to the price risks of any correction in the US bond markets. In isolation, this would tend to impinge on the capital positions of euro area life insurers. By contrast, any upturn in euro area long-term yields in the period ahead could prove beneficial for the life insurance industry given the positive impact on solvency positions.

All in all, the changes in asset mixes that took place in 2004 in several euro area countries have reduced the exposure of life insurers to interest rate risk, although duration gaps imply that the industry would benefit from any upturn. Regarding equity risk, there are indications that the equity market exposure of the euro area insurance sector remained broadly unchanged in 2004 compared with 2003.

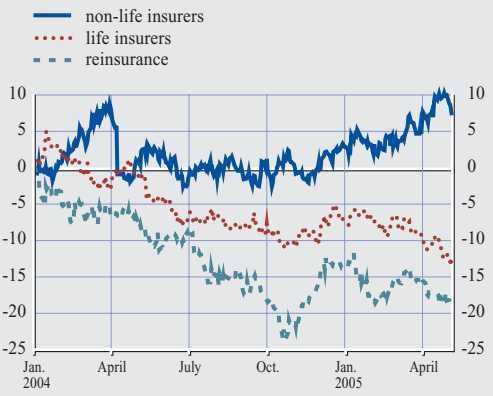
MARKET-BASED INDICATORS OF THE INSURANCE SECTOR'S SHOCK ABSORPTION CAPACITY

Since November 2004, all market-based indicators have suggested that market participants perceive the financial condition of the euro area insurance industry to be improving. The stock indices of all insurance sub-sectors outperformed the broad euro area stock index (see Chart 5.2). The strength of these equity prices appears to reflect both enhanced earnings prospects and lower risk premia. The rebound of reinsurance sector stock prices seems particularly strong, although the sector is typically characterised by higher volatility compared to the life and non-life insurance sectors. In addition, the non-life insurance sector significantly outperformed the broad index, whereas the performance of the life insurance segment was more subdued.

3 See A. Persaud (2002), "Where Have All the Risks Gone?", Mercer Memorial lecture, 14 November.

Chart 5.2 Cumulative change in euro area insurance stock price indices relative to the Dow Jones EURO STOXX

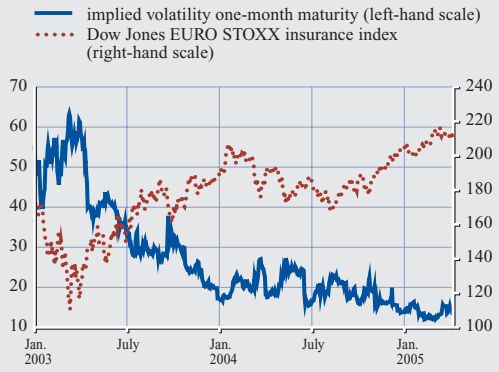
(Jan. 2004 - May 2005, % points)



Source: Thomson Financial Datastream.

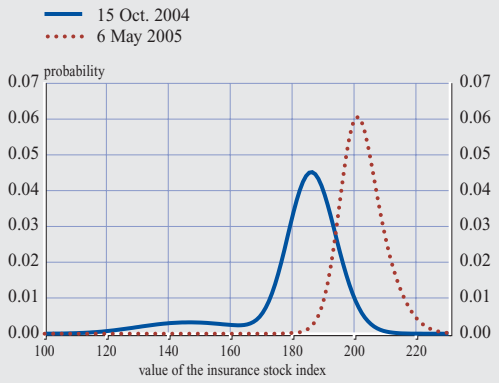
Chart 5.3 Dow Jones EURO STOXX insurance index and its implied volatility

(Jan. 2003 - May 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.

Chart 5.4 Risk-neutral probability density function on the Dow Jones EURO STOXX insurance index



Sources: Bloomberg and ECB calculations.

As one indication that the strength of insurance sector stock prices was underpinned by perceptions of declining risk after November 2004, implied volatility on the Dow Jones euro area insurance stock index – which reflects the market's expectations regarding the future volatility of the index – declined further (see Chart 5.3).

The balance of risks to insurance sector stock prices can shed light on market perceptions about the importance of downside risks to the earnings capacity of the industry. One indicator that provides a yardstick of the degree of asymmetry in perceptions of probable outcomes is the risk-neutral probability density functions (PDF, see Chart 5.4). After October 2004, PDFs for the insurance stock index became thinner, indicating that expectations regarding the future value of the index over a very short-term horizon were less dispersed. Whereas in October 2004 the risk of a sharp decline in the index was assigned a relatively higher probability than the risk of a sharp increase, by May 2005 the PDF had become more symmetric. Hence, market participants appear to see a more balanced risk outlook for the sector than was the case six months ago.

Regarding the credit risk posed by euro area insurance companies, developments in the subordinated bond market show a continuous narrowing of spreads to very low levels, notwithstanding the rebound of spreads in April (see Chart S66). However, due to the apparently rather low risk aversion among market participants, the information contained in this indicator should be assessed cautiously. The expected default frequency (EDF) – a yardstick of credit risk based on equity prices – may have been less affected by the "search for yield" environment. It also showed a pronounced improvement after late 2004 with more significant declines in EDFs among the most fragile insurance companies in the euro area (see Chart S67).

5.3 OVERALL ASSESSMENT

The outlook for the insurance industry as a whole seems to have improved over the past six months. This is to a large extent due to the overall strengthening of stock markets, which helped to fortify insurance companies' balance sheets. Even though EDFs for the most fragile insurers have remained at high levels, most market-based indicators suggest that the risks

facing the insurance sector are perceived as having declined.

In the euro area non-life insurance sector, profitability in the period ahead will be conditioned upon further improvement in investment returns in the context of decreasing performances from the underwriting business.

Profitability in the life insurance industry is likely to remain subdued. As the holdings of fixed income assets by life insurance companies in some euro area countries have increased, an abrupt rise in long-term interest rates would be likely to depress investment returns further. Moreover, these firms will not significantly benefit from any favourable developments in the equity market, as the proportion of equity in their investment portfolios is lower than those of non-life insurers. Hence, continued improvement in underwriting results will prove crucial for maintaining profitability in the period ahead.

Despite the global nature of the reinsurance market, euro area companies should be relatively less exposed to the new cycle of declining reinsurance premia than their competitors. The sector should therefore continue to post profitable underwriting results. Primary insurers might increasingly prefer euro area reinsurance companies because of their relatively strong financial ratings.

6 STRENGTHENING EURO AREA FINANCIAL SYSTEM INFRASTRUCTURES

6.1 PAYMENT SYSTEMS

Any assessment of the stability of the financial system must include an appraisal of the functioning of large-value payment systems. Such systems are the networks through which financial institutions are interconnected, and are thus at the core of the financial system. These systems are essential for the smooth functioning of the payment system, facilitating an efficient and effective allocation of financial resources, and thereby contributing to economic efficiency.

Substantial growth in the volume of transactions in highly liquid domestic and international financial markets over the past two decades or so has meant a corresponding increase in payment flows. These flows are facilitated by an interlocking network of wholesale payment systems. A disturbance in one of these payment systems – e.g. an operational mishap, the failure of one institution to pay another, or a liquidity problem in the money markets – could, through a domino effect, have systemic consequences with adverse implications for trade, finance and economic activity.

Both market participants and central banks have a strong interest in ensuring that payment systems function in a secure and reliable manner, given the contribution they make to economic efficiency, coupled with their potential to transmit or create systemic disruptions. Market participants use payment systems to honour liabilities, while payment systems are crucial for central banks for several reasons: a well-functioning payment system is necessary for the successful execution of monetary policy; the security and operational reliability of such systems are critical as they are strategically important for the economy; high-value payments and securities operations are carried on central bank accounts; and central banks can contribute to reducing systemic risks if they have supervisory, regulatory or oversight authority.

This Sub-section describes recent developments in TARGET as well as in other large-value payment systems settling transactions in euro. A significant development in TARGET has been the connection to TARGET of a Polish real-time gross settlement (RTGS) system in euro (SORBNET EURO) via the Italian TARGET component. No major developments have taken place in EURO1, the largest privately operated payment system for euro credit transfers. Located outside (but of critical importance to) the euro area, CLS has further contributed to the reduction of global foreign exchange settlement risk by increasing its market share in the foreign exchange settlement business.

PAYMENT SYSTEMS OVERSIGHT

Payment systems oversight is one of the Eurosystem's main tasks. Its focus is on identifying potential risks and inefficiencies posed by the design and operation of payment systems – in particular TARGET and EURO1 as they are systemically important – and in taking steps to eliminate or control them.

The Core Principles report of the Committee on Payment and Settlement Systems (CPSS) spells out ten principles which systemically important payment systems should observe (see Box 16). These so-called Core Principles encourage the design and operation of ever safer and more efficient payment systems around the world.

RECENT DEVELOPMENTS IN TARGET

Concerning developments in TARGET over the past six months, the number of national RTGS systems in TARGET grew from 15 to 16. With effect from 7 March 2005, the ECB Governing Council approved the connection of the new Polish euro RTGS system SORBNET-EURO, operated by Narodowy Bank Polski, to TARGET. SORBNET-EURO is only indirectly connected to TARGET via the Banca d'Italia and its national RTGS system BIREL, but it is

Box 16

THE CORE PRINCIPLES FOR SYSTEMICALLY IMPORTANT PAYMENT SYSTEMS

Safe and efficient financial infrastructures support the effectiveness of financial markets and can help in containing systemic risk. As payment systems are a core component of the financial system infrastructure, and as the volumes and values of transactions being transferred through payment systems around the world continue to grow, robust and efficient payment systems are indispensable. In order to contribute to preventing a potential malfunctioning of a payment system from triggering wider disruptions in the financial system and to maintain and promote robust financial systems, their design and operation should be based on internationally recognised and widely accepted standards. In January 2001, the G10 Governors endorsed a report entitled "Core Principles for Systemically Important Payment Systems" (also known as the Core Principles report).[1] The Core Principles report extends the Lamfalussy Standards,[2] which were designed for a very specific category of systems. It applies more broadly to systemically important payment systems of all types, not just to schemes that involve cross-border and multi-currency netting, and to all countries in the world. The Core Principles complement the six Lamfalussy Standards, the primary concern of which was the management of (non-)financial risk, with four further principles. These principles are concerned with the promptness of settlement (Core Principle IV), the credit risk associated with settlement assets (Core Principle VI), efficiency (Core Principle VIII), and governance (Core Principle X). The Core Principles are intended for use as universal guidelines to encourage the design and operation of ever safer and more efficient payment systems around the globe. In detail, the principles state that:

I. The system should have a well-founded legal basis under all relevant jurisdictions.
II. The system's rules and procedures should enable participants to have a clear understanding of the system's impact on each of the financial risks they incur through participation in it.
III. The system should have clearly defined procedures for the management of credit risks and liquidity risks, which specify the respective responsibilities of the system operator and the participants, and which provide appropriate incentives to manage and contain those risks.
IV. The system should provide prompt final settlement on the day of value, preferably during the day and at a minimum at the end of the day.
V. A system in which multilateral netting takes place should, at a minimum, be capable of ensuring the timely completion of daily settlements in the event of an inability to settle by the participant with the largest single settlement obligation.
VI. Assets used for settlement should preferably be a claim on the central bank; where other assets are used, they should carry little or no credit risk and little or no liquidity risk.
VII. The system should ensure a high degree of security and operational reliability and should have contingency arrangements for timely completion of daily processing.
VIII. The system should provide a means of making payments which is practical for its users and efficient for the economy.

1 See Committee on Payment and Settlement Systems (CPSS), "Core Principles for Systemically Important Payment Systems", BIS, January 2001.
2 Report of the Committee on Interbank Netting Schemes of the Central Banks of the Group of Ten Countries, BIS, November 1990.

IX. The system should have objective and publicly disclosed criteria for participation, which permit fair and open access.
X. The system's governance arrangements should be effective, accountable and transparent.

In addition to these principles, the Core Principles report explicitly recognises that safety and efficiency in payment systems are key public policy objectives, and defines the distinctive role of payment systems oversight. Central banks, in their capacity as overseers of payment systems, should ensure that the systems they operate and/or oversee comply with the Core Principles. Central banks play a leading role in this respect, *"particularly because of their strong interest in financial stability, their role in providing settlement accounts for payment system participants, and their concerns with the functioning of money markets for the implementation of monetary policy and with maintaining confidence in the domestic currency both in normal circumstances and in a crisis."* Against this background, the Core Principles report sets out four central bank responsibilities (Responsibilities A-D) in applying the Core Principles to systemically important payment systems, as follows:

A. The central bank should define clearly its payment system objectives and should disclose publicly its role and major policies with respect to systemically important payment systems.
B. The central bank should ensure that systems it operates comply with the Core Principles.
C. The central bank should oversee compliance with the Core Principles by systems it does not operate and it should have the ability to carry out this oversight.
D. The central bank, in promoting payment system safety and efficiency through the Core Principles, should cooperate with other central banks and with any other relevant domestic or foreign authorities.

The Governing Council of the ECB adopted the Core Principles as the minimum standards of the Eurosystem's common oversight policy on payment systems in January 2001. They are also part of the compendium of 12 standards that the Financial Stability Forum (located at the Bank for International Settlements (BIS)) considers essential for safeguarding financial stability.

According to the Core Principles report, a *"payment system is systemically important where, if the system were insufficiently protected against risk, disruption within it could trigger or transmit further disruptions amongst participants or systemic disruptions in the financial area more widely. […] Systemic importance is determined mainly by the size or nature of the individual payments or their aggregate value. Systems handling specifically large-value payments would normally be considered systemically important."* The Eurosystem takes the view that, in general terms, at least one payment system in each country or currency area should qualify as a systemically important payment system. As a result, where there is only one system operating in a country or currency area, this system is considered systemically important irrespective of the value of the payments it handles. In the euro area, the Eurosystem regards the TARGET system and three net or hybrid settlement systems (EURO1, PNS, POPS) operating in euro as systemically important payment systems. Through its oversight activities, the Eurosystem contributes to ensuring that these systems continuously achieve a high degree of compliance with the Core Principles and do not adversely impact the stability of the financial system in the euro area.

considered to be a fully fledged euro RTGS system and a component part of TARGET.

From a financial stability perspective, the connection of SORBNET-EURO required the full preservation of the systemic stability of the TARGET system. In order to ensure to the greatest extent possible that the connection would not have any adverse impact on the proven safety and efficiency of the existing TARGET system, both Narodowy Bank Polski and the Banca d'Italia were obliged to complete successfully all necessary operational preparations, including, for example, the conduct of the security assessment of SORBNET-EURO and the testing of the connection. Moreover, Narodowy Bank Polski had to adopt the relevant national legal acts and arrangements implementing the TARGET legal framework, in order to become subject to the rights and obligations of the TARGET framework. Furthermore, two oversight assessments had to be carried out in accordance with the Eurosystem's common oversight policy. First, the design of SORBNET-EURO was required to undergo an assessment against the Core Principles (see Box 16), which the Governing Council of the ECB adopted in January 2001 as the minimum common standard for the Eurosystem's oversight policy. Secondly, it had to be ensured that the Italian BIREL system remained compliant with these principles following the connection of SORBNET-EURO. The outcome of the assessment was positive overall: SORBNET-EURO was assessed as having achieved a high degree of compliance with all relevant Core Principles, and the degree of compliance of BIREL with the relevant Core Principles was not adversely impacted by the connection of SORBNET-EURO.

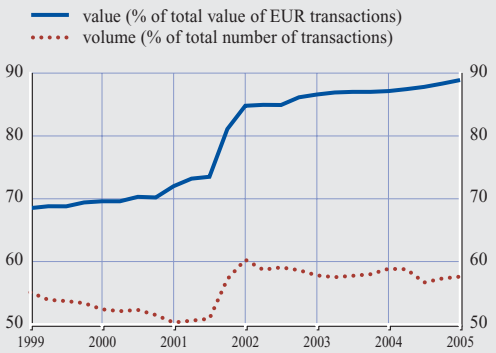
RECENT DEVELOPMENTS IN SETTLEMENT IN EURO LARGE-VALUE PAYMENT SYSTEMS

TARGET

From a financial stability perspective, it is desirable that very high-value payments should be processed safely via RTGS systems, given that such operations entail immediate finality and zero credit risk for the participants in the system. TARGET, which has been operating since 1999, is the RTGS system for the euro area. In line with Core Principle VI (see Box 16) and the Eurosystem's policy of encouraging the settlement of large-value payments in central bank money, the proportion of large-value euro payments settled in TARGET continued to grow both in terms of value and volume over the past six months (see Chart 6.1).

Chart 6.1 Large-value payments processed via TARGET

(Q1 1999 - Q1 2005)



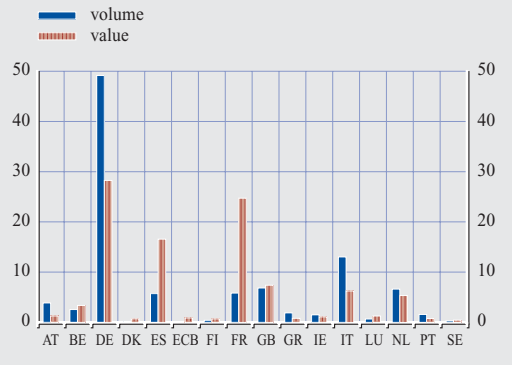
Source: ECB.

The five main national RTGS systems in TARGET – those of Germany, France, Spain, Italy and the UK – had in 2004 a collective share of 80% in terms of volume and 83% in terms of value 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 prevent any adverse effect on the smooth functioning of TARGET as a whole.

The technical availability of not only these five systems, but also of the other national RTGS systems participating in or connected to TARGET, has remained highly reliable. Incidents interrupting availability were generally related to some technical instability which could in most cases be resolved on the spot. Where needed, business continuity

Chart 6.2 Large-value payments processed via TARGET by country

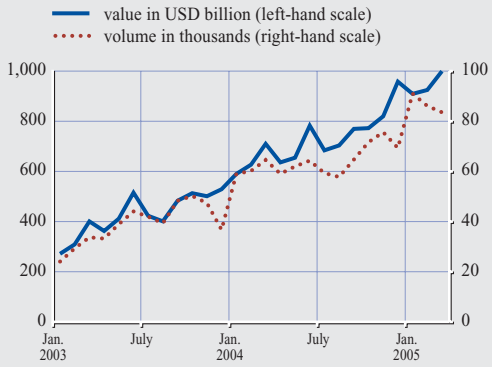
(Jan. 2004 - Mar. 2005, % of the NCBs'/ECB's share in terms of value and volume)



Source: ECB.

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

(Jan. 2003 - Mar. 2005)



Source: ECB.

measures were successfully applied. From a financial stability perspective, this is reassuring as it shows that the TARGET system is able to cope with technical problems effectively.

CLS

The Continuous Linked Settlement (CLS) system is, in terms of value, the second largest payment system settling euro transactions, after TARGET. The functioning of CLS is of interest to the Eurosystem because instabilities in the CLS system could have systemic implications for the euro area.

CLS began settling foreign exchange (FX) transactions in September 2002. The system almost entirely eliminates FX settlement risk, as it settles both legs of a FX transaction simultaneously and only once sufficient positive funds are available for settlement. In March 2005, 58 major global banks were directly settling their FX transactions in 15 major currencies via CLS. In addition, 340 customers of these banks were also using the CLS settlement mechanism. In March 2005 transactions settled in CLS amounted to 2 trillion in US dollar equivalent (see Chart 6.3)[1], while FX settlement risk eliminated by CLS amounted to 1.9 trillion in US dollar equivalent. The share of the euro in CLS was 20.1% in March 2005, so that the elimination of euro settlement risk amounted to approximately 296 billion euro.

In April 2004, the BIS conducted its triennial central bank survey on foreign exchange and derivatives market activity. This survey revealed that CLS eliminated about one-quarter of the entire global FX settlement risk at the time. Given the growing value and volume of FX transactions settled through CLS after that, this share is likely to have increased commensurately.

SWIFT

The SWIFT cooperative is important from a financial stability perspective as it provides secure messaging services to the financial community in more than 200 countries around the world. Following the recent successful migration to SWIFTNet – a data transmission network built on internet-based technology – SWIFT has emphasised the expansion of its customer base to attract new potential markets and industry sectors. Over the years, SWIFT has gradually expanded its business reach, starting in payments, moving to securities, and

1 Given that each trade consists of two FX transactions – one in each currency – in March 2005 CLS settled FX trades with a value of one trillion US dollar equivalent.

more recently extending to investment institutions as well as now to corporate enterprises. In order to facilitate this, SWIFT has broadened the connectivity options for its users, ranging now from the traditional "heavy duty" connections for large-volume users over dial-up connections, in which case the user uses a simple modem to connect to the SWIFT network, to outsourcing SWIFT connectivity management to service bureaus. SWIFT is also evolving to maintain its role in the financial industry. From its traditional core mission (namely, to offer a secure network for financial messaging), SWIFT is gradually expanding its range of products and services, which allows the integration of various post-trade and retail banking activities with the users' SWIFTNet connection.

Major consideration will be given by the overseers – the G10 central banks and the ECB – to the security and availability of the SWIFT services.

6.2 SECURITIES CLEARING AND SETTLEMENT SYSTEMS

Clearing and settlement are essential functions in securities markets as they provide a means of transferring the ownership of securities. If clearing or settlement systems are disrupted, it will be difficult to avoid a spillover to the financial markets. As economies of scale and network effects play an important role in clearing and settlement activities, many financial markets tend to have only a few central clearing and settlement systems. The concentration of activities that accompanies this accordingly implies that these infrastructures are of great systemic relevance.[2] As described in the December 2004 FSR, due to market pressure, the European clearing and settlement landscape has undergone further integration and consolidation since the start of EMU, not only within, but also across countries.

In the field of securities clearing and settlement, the market trend towards consolidation and the search of central counterparties (CCPs) for new business opportunities as identified in the December 2004 FSR continued. Moreover, internationally coordinated initiatives of overseers and regulators have resulted in new sets of standards and recommendations for entities involved in clearing and settlement.

RECENT CONSOLIDATION ACTIVITY

In the field of CCP clearing, consolidation has taken place within the OMX Group, with all infrastructures for the trading and clearing of Finnish derivatives moving from Finland to

2 See ECB (2004), "Securities Settlement Systems and Financial Stability", FSR, December 2004.

Table 6.1 Euro area CCPs for financial instruments

Country	January 1999	May 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, government bonds, derivatives on debt instruments) MEFF Renta Variable (derivatives on equities)[1)]
France	Bourse de Paris (SBF) (equities and options); Matif (derivatives; subsidiary of SBF) Clearnet (repos, government bonds; subsidiary 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 (derivatives)	CCP Austria (derivatives, securities)
Portugal	BVLP (derivatives)	none
Finland	HEX (derivatives)	none

Source: ECB.
1) MEFF Renta Fija and MEFF Renta Variable belong to the same holding company.

Sweden by the end of 2004. Finland no longer has a CCP as a result. Furthermore, on 31 January 2005, the CCP operated by Wiener Börse was discontinued and a new entity, CCP Austria, was established. The new CCP is jointly owned by Wiener Börse and the Austrian central securities depository (OeKB). Table 6.1 provides a picture of the CCP landscape in the euro area as it stood in May 2005. It shows that the number of CCPs declined from 14 in January 1999 to 7 in May 2005.

Turning to the field of settlement, the trend towards consolidation has continued over the last six months. As reported in the December 2004 FSR, the central securities depositories (CSDs) of Finland and Sweden, APK and VPC, merged in the fourth quarter of 2004. VPC is still an independent company. APK, previously owned by OMX, is now a 100% subsidiary of VPC. However, APK and VPC continue to exist as legal entities and to operate technologically separate systems, but under a common brand name, Nordic CSD. In November 2004, Euroclear and Euronext announced that Euroclear Group will purchase CIK, the Belgian CSD currently owned by Euronext, in 2005.

Table 6.2 provides an overview of the CSD landscape in the euro area in May 2005, listing all legal entities incorporated in the euro area that operate a CSD. It is notable that the number of entities has only declined by four since the start of EMU – there were 23 in January 1999 and 19 in May 2005 – indicating that the technical consolidation of CSDs has been very limited. However, many CSDs now belong to a holding company that owns several CSDs: Euroclear Group comprises Euroclear Bank, Euroclear France, Euroclear Netherlands and CrestCo, the CSD of the UK; Clearstream International comprises Clearstream Frankfurt and Clearstream Luxembourg; NCSD comprises VPC and APK; and all Spanish CSDs belong to BME Group.

As discussed in the December 2004 FSR, the consequences of the consolidation of clearing and settlement systems for financial stability are ambiguous. On the one hand, it creates more systemically important entities. On the other hand, it reduces the number of entities involved in, and thus the complexity of, clearing and settling activities. This means that less information and fewer instructions must be sent from one system to another. However, this latter, positive effect can only fully materialise if systems are technically integrated. As the prevailing form of consolidation in the field of CSDs has been purely legal mergers up to now, increasing efforts to foster the technical consolidation of systems as well would be desirable.

Table 6.2 CSDs in the euro area

Country	January 1999	May 2005
Belgium	NBB-SSS CIK Euroclear	NBB-SSS CIK Euroclear Bank
Germany	Deutsche Börse Clearing (DBC)	Clearstream Frankfurt (former DBC)
Greece	BOGS CSD SA	BOGS CSD SA
Spain	CADE SCLV Espaclear SCL Bilbao SCL Barcelona	Iberclear SCL Bilbao SCL Barcelona SCL Valencia
France	Sicovam	Euroclear France (former Sicovam)
Ireland	CBISSO NTMA	NTMA
Italy	Monte Titoli CAT	Monte Titoli
Luxembourg	Cedel	Clearstream Luxembourg (former Cedel)
Netherlands	Necigef	Euroclear Netherlands (former Necigef)
Austria	OeKB	OeKB
Portugal	Interbolsa SITEME	Interbolsa SITEME
Finland	APK	APK

Source: ECB.

EXPANSION OF CCPS' ACTIVITIES

The search for new business opportunities is another trend that is characteristic of CCPs'

activities and was highlighted in the December 2004 FSR. While in the past most CCPs only cleared derivatives, many of them now also clear securities transactions. This trend has continued over the last six months. In Austria, the CCP activities of the Vienna Stock Exchange were transferred to a new entity, CCP Austria, on 31 January 2005. While the Vienna Stock Exchange had only cleared derivatives, CCP Austria clears both derivatives and securities transactions. As discussed in the December 2004 FSR, CCPs are now taking over counterparty risk from trading partners. As CCPs are highly specialised in managing counterparty risk, CCP clearing might thus have the potential to make financial markets safer. This trend is therefore welcome from a financial stability point of view.

In this context, there is another field of business opportunities for CCPs that has not yet been fully exploited, namely the OTC derivatives markets. These markets have grown substantially in recent years, but their post-trading infrastructure remains somewhat underdeveloped. Again, CCP clearing could potentially increase the stability of these markets (see Box 17).

Box 17

CLEARING OF OVER-THE-COUNTER (OTC) DERIVATIVES TRANSACTIONS

In March 2005, the Bank for International Settlements (BIS) published its regular Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity.[1] The survey compiles statistics gathered by 52 central banks and monetary authorities around the world. The turnover part of the survey is based on data for April 2004. It covers both foreign exchange and OTC derivatives markets, while the part on positions in derivatives contracts reflects the situation as it was in June 2004 and purely covers OTC derivatives. This Box highlights some of the key findings of the survey and reviews some initiatives that have taken place in the development of infrastructures for post-trade processing in OTC derivatives markets.

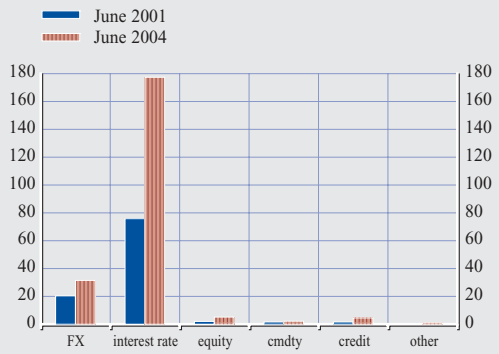
The main finding of the BIS survey is that, in comparison to the last survey conducted in 2001, both turnover and outstanding volumes have grown substantially, reaching new record highs. In the case of OTC derivatives, outstanding notional amounts increased by 120% between June 2001 and June 2004, reaching USD 220 trillion in June 2004 (see Chart B17.1); after adjusting for currency movements, this represents an increase of approximately 80%. The most remarkable growth was recorded in the credit derivatives sector (see Chart B17.2), where outstanding volumes rose more than six-fold from USD 700 billion to USD 4,500 billion in the same period. Credit default swaps (CDS) accounted for most of this increase, thanks to the standardisation of contractual terms as well as the establishment of CDS indices and trading platforms. The counterparty breakdown provided in the survey of the OTC derivatives market shows that the share of turnover with financial institutions other than reporting dealers increased as well to reach 43% of global turnover, up from 29% in April 2001. This increase may reflect a greater use of derivatives by small commercial banks, mutual funds, insurance companies and hedge funds.

The increasing popularity of OTC derivatives with end-investors means that there has been commensurate growth in the needs of dealers/market makers in these products to offset customer transactions in the marketplace. Apart from the higher administrative burden arising from the greater number of transactions, this growth brings with it an increase in operational

1 See BIS (2005), "Triennial Central Bank Survey – Foreign Exchange and Derivatives Market Activity in 2004", March (available at http://www.bis.org/publ/rpfx05t.pdf).

Chart B17.1 Outstanding amounts of OTC derivatives

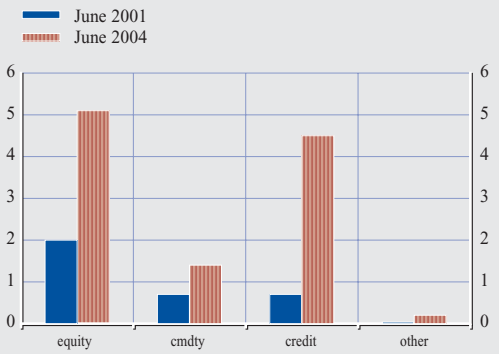
(USD trillion)



Source: BIS.

Chart B17.2 Outstanding amounts of OTC derivatives

(USD trillion)



Source: BIS.

and credit risk and, mirroring this, the need for additional regulatory capital. It appears, however, that the rapid growth in the OTC derivatives markets, and especially the credit derivatives segment, might not have been matched by equivalent growth in investment in infrastructures for post-trade processing (i.e. clearing and settlement as well as servicing of the outstanding transactions until maturity) – a fact that has been pointed out recently by the UK's Financial Services Authority.[2] The need to address this phenomenon is made even more important by the fact that a large part of the transactions in dealers' books can be viewed as redundant, at least from the point of view of their market positioning. This is because these positions are used to offset the unwanted components of the risk with other market makers. These outstanding positions with other market makers often go in opposite directions, effectively cancelling each other out. However, they still need to be kept in the dealers' books and serviced. Dealers have used occasional bilateral netting and the termination of such "unnecessary" transactions without any significant decrease in overall outstanding volumes.

The problems of extensive credit line utilisation or insufficient back office capacity are neither new nor restricted to credit derivatives. These issues have been addressed from different angles with varying success. One of the ways to ease the burden on banks' back offices as well as credit lines is through the introduction of a central counterparty for the risk management and settlement of OTC derivatives. One such service for interest rate swaps (IRS) is called SwapClear, which was launched in September 1999 by the London Clearing House Ltd (now LCH.Clearnet Ltd). In this scheme, LCH.Clearnet becomes the central counterparty to, and has responsibility for, the corresponding trade obligations arising from each half of the original bilaterally negotiated IRS. The dealers' bilateral netting arrangements are replaced by more efficient multilateral netting, thus releasing credit lines, reducing regulatory capital requirements as well as operational risk and cost. This is because multiple cash flows are netted and replaced with one single payment per currency per day to or from the central counterparty. Credit exposures are further reduced through daily margining arrangements. In the event of a default of one of the original parties to the transaction, the central counterparty continues to service the trade so that the non-defaulting party is not affected. By the end of April 2005, the notional amount of IRS transferred to SwapClear by its 19 member banks was USD 45 trillion.

2 See the letter from the FSA to chief executives of major participants in the OTC credit derivatives market (available at http://www.fsa.gov.uk/Pages/Library/Communication/PR/2005/022.shtml)

A different scheme, originally started in April 2003 for IRS and recently extended to cover CDS and energy derivatives, aims at reducing the burden on banks by terminating derivatives transactions on a multilateral basis. In this service, provided by TriOptima AB of Sweden under the name of triReduce®, a successful termination process ensures that the transactions no longer exist. Therefore, credit exposure and operational risk are not merely reduced, but are also completely eliminated. The process is based on the assumption mentioned above that many of the trades on banks' books are merely hedging trades used to pass on the undesired parts of their risk to other market makers. TriOptima collects information on such "unnecessary" trades from multiple market participants without disclosing individual positions to the other participants. Each participant has to define tolerances and preferences regarding the market and credit risk change of their position after the proposed termination. The trades are then matched and a termination proposal is calculated. The proposal is passed on to each participant together with the resulting changes in net positions within the tolerance limits. As of the end of April 2005 26 cycles in eight currencies had been run on interest rate derivatives, resulting in the termination of IRS with a notional value of USD 9.2 trillion. In CDS, eight termination cycles in both single name CDS and CDS indices have terminated to date a total of USD 276 billion notional value of contracts. The success rates, i.e. the proportion of terminated trades to the total number of trades submitted, have varied according to the underlying between 40% and 80%.

While the long-term impact of the aforementioned schemes on the total outstanding volume of derivatives contracts will still have to be assessed, they can certainly be seen as a useful addition to the available risk-reducing instruments, thereby also reducing some of the potential financial stability risks associated with the continued strong growth of OTC derivatives markets.

STANDARDS AND RECOMMENDATIONS

As the clearing and settlement industry in the euro area and the EU as a whole becomes increasingly integrated, the need to coordinate the activities of overseers and regulators of clearing and settlement systems across countries has increased. In view of this, the ESCB and the Committee of European Securities Regulators (CESR) set up a joint working group in October 2001 to design new standards for securities clearing and settlement systems. In October 2004, a report of this working group entitled *"Standards for Securities Clearing and Settlement in the European Union"*, which contained 19 standards, was approved by the Governing Council of the ECB and by CESR (see Box 18). The standards will be finalised once the accompanying assessment methodology has been defined.

Box 18

ESCB-CESR STANDARDS FOR SECURITIES SETTLEMENT SYSTEMS

In October 2004, the Governing Council of the ECB and CESR approved a report entitled "Standards for Securities Clearing and Settlement in the European Union". The report, prepared by a joint ESCB-CESR working group, contains 19 standards for securities settlement systems, in particular central securities depositories (CSDs), including international CSDs, and custodian banks in the EU. This Box briefly describes some of the most important aspects addressed by the 19 standards. A major aim of the standards is "to limit and manage systemic risk". Five types of risks in the securities settlement process are explicitly addressed.

Credit risk
Credit risk is the risk of loss due to the default of another party. There are different types of credit risk in securities settlement. Principal risk, for example, is the risk that one party in a securities transaction, the buyer or the seller, could lose up to the full value of the assets involved in the transaction. It materialises if, for example, the buyer transfers the payment to the seller and thereafter the seller proves unable to deliver the security to the buyer, typically due to insolvency. The losses may also lead to the insolvency of the buyer with possible further contagion effects. Principal risk can be eliminated by settlement in delivery versus payment (DVP) mode. Payments are then delivered from the buyer to the seller if and only if securities are delivered from the seller to the buyer. ESCB-CESR Standard 7 requires that securities transfers be linked to payment transfers "in a way that achieves delivery versus payment".

Another form of credit risk is the risk that the settlement service provider could itself default. A few CSDs act as banks in the sense that they grant credit to participants. If a major participant defaults on such a credit, then the CSD itself may be in danger. As a consequence, the disruption of securities settlement and thus of the entire financial market is possible. For this reason, Standard 9 requires CSDs to limit their credit activities and to collateralise their credit exposure whenever practicable. Furthermore, it requires securities regulators, banking supervisors and overseers to ensure that the credit activities of custodian banks do not create undue risks for the financial system.

Liquidity risk
Liquidity risk is the risk that one party in a security transaction is unable to fulfil its delivery obligation in time. Settlement may be postponed in this case. However, if the other party urgently needs to deliver the assets it was expecting to a third party, which again may urgently need these assets, a contagion effect could be created. To mitigate liquidity risk, Standard 5 aims at encouraging the setting up of securities lending arrangements. If an efficient securities lending arrangement is in place, then a seller which would otherwise be unable to deliver securities in time can borrow the respective securities and ensure timely settlement. In some cases, the settlement service provider, for example a CSD, may act as the central principal in all securities lending transactions and can thus be exposed to credit risk. With a view to Standard 9 (see previous paragraph), Standard 5 emphasises that in this case, the settlement service provider should apply adequate risk management measures.

Custody risk
Shares in a security may get lost or may be transferred to the wrong party, typically due to human error, negligence, fraud, insolvency and the like. Obviously, this may result in disruptions to the financial markets. Standard 6 encourages the dematerialisation and immobilisation of securities because paper certificates, especially if they are often transported from place to place, can be lost more easily than securities kept in electronic form. Standard 12 requires that the securities that an investor holds on a securities account with a settlement institution are protected against insolvency of the settlement institution: it must be ensured that creditors of the settlement institutions cannot claim these securities, i.e. they must not be included in the estate of the settlement institution, should this institution become insolvent.

Operational risk
Standard 11 aims at limiting the risk of operational problems which, in a major settlement system, can have a severe impact on financial markets. It stipulates, among other factors, that

such systems must have business continuity plans and backup facilities in place to enable a fast resumption of business after a technical disruption. Alternative communication means should be available. Finally, IT systems should be capable of processing peak volumes.

Legal risks
Legal risks arise, for example, if applicable laws, rules and regulations are unclear or if there are different conflicting laws, rules and regulations and it is not clear which of them is applicable. This is especially relevant in the case of cross-border settlement. Court decisions may be delayed in these cases, and the continuous use of assets may be blocked. Standard 1 therefore requires settlement systems to have a sound legal basis.

It is important to note that the ESCB-CESR standards are a refinement of the CPSS-IOSCO recommendations for securities settlement systems discussed in Box 20 of the December 2004 FSR. The CPSS-IOSCO recommendation, drafted by a joint task force of the CPSS of the central banks of the G10 countries and the International Organization of Securities Commissions (IOSCO), are designed to be applicable worldwide. The ESCB-CESR standards adapt the CPSS-IOSCO recommendations to the EU environment. The latter are recommendations and, as such, are not always easy to enforce. The ESCB-CESR standards however will be applied by the relevant authorities and compliance with them will be reviewed on a regular basis. As a result, the new standards have significant potential to enhance financial stability in the euro area and in the EU.

It should be noted that the ESCB-CESR working group's report identified a number of issues that require further analysis. These issues will be addressed in close cooperation with market participants while an assessment methodology is being developed. The ESCB-CESR standards will come into force when this methodology has been finalised.

In December 1999, the CPSS of the central banks of the G10 countries and the International Organization of Securities Commissions (IOSCO) established a joint task force to draft recommendations for clearing and settlement systems. In November 2001, the recommendations of the task force for securities settlement systems (SSSs) were published. In November 2004, the CPSS-IOSCO published a final report with recommendations for CCPs after a round of public consultation. Similar to the recommendations for SSSs, the CPSS-IOSCO recommendations for CCPs aim at reducing risks to financial stability, since "a well designed CCP with appropriate risk management arrangements reduces the risks faced by SSS participants and contributes to the goal of financial stability".

To sum up, the important work of ESCB-CESR and CPSS-IOSCO demonstrates that regulators and overseers, in reacting to rapid changes in the clearing and settlement industry, have increased their efforts to enhance and coordinate their activities in clear recognition of the systemic importance of this industry.

6.3 QUOTE-DRIVEN ELECTRONIC TRADING PLATFORMS

This Sub-section, drawing on recent incidents, discusses the side-effects of quote-driven electronic trading platforms and the possible risks they can pose to market participants.

An incident in August 2004 involving a large international investment bank from the MTS Group operating on several electronic trading platforms for European bonds triggered an intense discussion over the functioning of quote-driven electronic trading systems. A particularly pertinent question was whether the quote-driven – as opposed to order-driven – electronic trading platforms (ETPs), such as EuroMTS, could expose some banks to too much risk.

The purpose of this Sub-section is not to assess the appropriateness of the operations carried out by the bank, but rather to point to some possible side-effects of the electronic trading environment that can be exploited by market participants. It also seeks to draw some tentative conclusions regarding the financial stability aspects of quote-driven ETPs.

In quote-driven systems, prices are determined on the basis of the (sometimes mandatory) quotations of market makers, with other market participants being able to execute transactions by merely "hitting" the quoted bid or offer price. In contrast, in an order-driven system, market participants submit their buy or sell orders, and transaction prices are calculated on the basis of the submitted orders.

To briefly recapitulate the facts, on 2 August 2004 the trading activities of a large investment bank on a number of the MTS Group markets created a short-lived disruption in the cash market for bonds as well as in the bond futures markets. Reportedly, the bank managed to sell more than EUR 11 billion in euro-denominated bonds through the MTS platforms within two minutes. The transactions involved amounted to about 40% of the daily average turnover of the trading platform. About half an hour after the sales, the bank bought back EUR 4 billion of the same bonds at cheaper prices, making a sizeable profit. The transactions apparently did not breach any rule of the trading platform[3], but some dealers accused the investment bank of market manipulation, and the regulatory authorities in several European countries launched investigations that, in some cases, are still ongoing.

The bank appears to have exploited the fact that EuroMTS is a quote-driven trading system in which participants must provide two-way quotes for every bond traded in this system, for at least five hours per day, for amounts of at least EUR 10 million. Many banks use automatic quoting machines for this purpose, and these machines usually calculate the quoted prices on the basis of current price levels of the related bond futures contract (e.g. the Eurex Bund future contract for a ten-year bond). The bank's strategy was as follows: the bank first pushed up the futures prices so that the (automatic) quotations in various MTS platforms reacted accordingly. Then it began to make sizeable sales of cash bonds on these systems, hitting most market makers' (automatic and mandatory) quotations in the system within seconds.

An important factor contributing to the successful implementation of this strategy is that liquidity in the Eurex futures markets, although very deep, does not match that of the MTS market. This is because MTS dealers are obliged to provide continuous quotes, and this greater pricing transparency, by lowering risks for market makers, leads to narrower bid-ask spreads. Moreover, the depth of liquidity on Eurex varies according to the season – August being a traditional vacation month when market liquidity tends to be lower than average. Given these liquidity imbalances between the two markets, it was possible to exploit for profit the quoting obligation on MTS: the bank was able to drive up the futures prices with rather small amounts and with it (because of the automatic pricing based on the futures prices), the quotes for cash bonds on MTS platforms, while it was then able to sell a large number of bonds in large volumes in the cash market, taking advantage of the higher cash prices.

Although these trades had a disruptive effect on the price discovery process, the MTS systems proved that they could cope with a surge of transactions. Settlement failures were also avoided. However, a sudden increase in the number of transactions might nevertheless have the potential to impact negatively settlement efficiency, as some smaller financial firms in particular do not possess

3 The rules of the EuroMTS were amended temporarily after the incident to limit the amount of bonds that market-makers were allowed to trade to either 20% of the average daily market turnover of the previous ten trading days or to a maximum of EUR 1 billion (in Germany the limit was set to EUR 500 million). The measure was withdrawn after 10 September 2004.

fully automated straight-through-processing facilities, and a significant amount of their post-trade activities is still performed manually.

POSSIBLE SIDE-EFFECTS OF QUOTE-DRIVEN ETPs

The incident raises questions about the functioning of quote-driven ETPs, not only the MTS but more generally, as it has attracted increasing participation in market-making activities, including by banks that perhaps would not be involved in these activities if ETPs were not available. Bond issuers, especially governments, in their efforts to further improve liquidity in the secondary markets for their debt, often require their primary dealers to commit to market-making obligations. Moreover, this market-making activity is usually a necessary precondition for granting access to primary auctions or syndication groups of their new issues. Banks, on the other hand, hope to extract more revenue from dealing with governments in other areas (e.g. derivatives transactions or privatisations). Therefore they are keen to be seen at or near the top of the league tables that compare their activities in primary and secondary markets, even if these activities may not generate sufficient profits to be performed on a stand-alone basis. Regarding the data on secondary market transactions, the issuers often concentrate on the data provided by ETPs. Against this background, banks are willing to commit themselves to mandatory quotes (as they must do to participate for example in EuroMTS), although the incident in August 2004 revealed that this might have major drawbacks. It may therefore be worthwhile for issuers, market makers and quote-driven ETPs to re-examine the requirements for obligatory market making.

ETPs also provide a tool which enables market participants to execute orders rather quickly. Moreover, the links to automatic pricing engines make it possible to quote a relatively large number of bonds on a continuous basis with very tight bid/ask spreads. With such tools at their disposal, and under the aforementioned pressure by issuers, there is the temptation for many banks and dealers to enter the market-making business, which they might not otherwise be in a position to do. This raises the question of whether these developments have an impact on market functioning as well as possibly on financial stability.

Generally, the greater the number of participants in a market, the deeper the liquidity should be. Both from a financial stability and an efficiency viewpoint, this normally has clear benefits for market functioning, including lower market volatility and transactions costs (or tighter bid/ask spreads). At the same time, the relative ease with which quotes on two-way prices can be made for a large number of bonds may attract banks that are not properly equipped to do so, be it due to the lack of complex IT systems, skilled staff, market intelligence or even because of an insufficient capital base to hold large trading book positions across the whole yield curve. One or more events of a similar nature to the one that occurred in August 2004, even events potentially resulting from human error, could have adverse consequences for an individual financial institution. However, the likelihood of such an event having systemic implications seems rather low.

Overall, the incident in August 2004 points to some side-effects of the greater pricing transparency and ease of execution offered by quote-driven ETPs. With the resulting narrowing of bid-ask spreads, at a given level of activity, participation in trading and market-making activities becomes less lucrative for banks. However, larger banks, because they have the ability to influence pricing, could impose costs on smaller market participants to such a degree as to cause them to cease market-making activity.

Putting ethical and reputational aspects to a side, large players have clear incentives to drive smaller institutions out of a quote-driven market by exploiting the quoting obligation

imposed on all participants. Ultimately, this could imply less market liquidity, adversely affecting financial market efficiency – including market functioning. At the same time, smaller institutions may be exposed to substantial risks that far exceed their risk-taking capacity and may threaten their solvency. For this reason, a close monitoring of these developments in this area is warranted.

IV SPECIAL FEATURES

A ASSESSING FINANCIAL STABILITY: CONCEPTUAL BOUNDARIES AND CHALLENGES[1]

Central banks have a strong and natural interest in safeguarding financial stability. This special feature discusses some key ingredients that are needed for a systematic approach to financial stability monitoring and assessment. A good understanding of what is meant by financial stability and what is meant by financial instability, taken together, can serve to define the boundaries of the scope of the analysis. A balancing of financial efficiency and stability objectives may require an understanding of the safeguarding of financial stability less as a zero tolerance of bank failures or of an avoidance of market volatility, than as avoiding financial disruptions that have adverse consequences for the real economy.

INTRODUCTION

Central banks have a strong and natural interest in safeguarding financial stability. This is especially so because financial institutions, notably banks, are issuers of by far the largest component of the money stock. Similarly, a stable financial system is needed for the effective transmission of monetary policy and for the smooth operation of payment systems. In addition, the condition of the financial system is inextricably intertwined with the performance of the economy. For these reasons, a growing number of central banks around the world now address their financial stability mandates through the monitoring and assessing of financial stability and through the periodic issuing of their findings in public reports. The contents of these publications suggest that financial stability practitioners around the world share some common understandings. To cite just a few, it is more or less taken for granted that:

– finance is fundamentally different from other economic functions such as exchange, production, and resource allocation;

– finance contributes importantly to other economic functions and facilitates economic development, growth, efficiency, and ultimately social prosperity;

– financial stability is an important social objective – a public good – even if it is not widely seen as being on a par with monetary or price stability;

– monetary and financial stability are closely related, if not inextricably intertwined, even though there is no consensus on why this is so.

There is also a growing academic literature, much of it covering specific financial stability topics in considerable depth, and some of it providing rigorous anchors for debating substantive and policy issues. For example, there are extensive literatures dealing with the special role and fragility of banks in finance, the costs and benefits of deposit insurance, and the causes, consequences, and remedies for bank failures. There are also new and growing literatures on market sources of financial fragility and systemic risk more generally.

Despite considerable practical and intellectual progress in recent years, financial stability analysis is still in its infancy compared to macroeconomic and monetary analysis. The various literatures taken together do not yet provide cohesive and practical approaches or tool kits for assessing financial stability, for analysing systemic issues and controversies, or for designing policies to optimise the net social benefits of finance. In short, the discipline lacks a widely accepted and useful framework, and current practices for assessing financial stability tend to be more of an art form than a rigorous discipline or science.

This special feature discusses some key ingredients that appear to be needed for a framework for monitoring and assessing

1 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.

financial stability. In particular, it proposes boundaries that can help in defining the scope of the analysis.[2] While both the *prevention* and *resolution* of financial problems and crises are core objectives of the framework discussed, this special feature focuses exclusively on prevention, and in particular on *assessing* financial stability.

The rest of this special feature is organised as follows. Section 2 discusses the financial stability challenge including the possible relationship between efficiency and stability, and the need for a system-wide approach. Section 3 examines requirements for a useful framework for assessing financial stability. Section 4 briefly lays out an overarching framework for safeguarding financial stability in which both the prevention and resolution of financial problems and crises are key objectives. Section 5 briefly draws some conclusions. A special feature in the next issue of this review will assess the practical challenges that confront effective financial stability monitoring and assessment.

THE CHALLENGE OF FINANCIAL STABILITY

CHARACTERISING THE CHALLENGE

There are many ways in which to characterise the challenges faced in achieving and maintaining financial stability. Moreover, the nature of the challenge will depend to some extent on the structure and maturity of the economic system. This paper focuses on mature financial systems, for which the challenge of financial stability can be characterised as:

maintaining the smooth functioning of the financial system and its ability to facilitate and support the efficient functioning and performance of the economy.

To achieve financial stability, it is necessary to have in place mechanisms that are designed:

to prevent financial problems from becoming systemic and/or threatening the stability of the financial and economic system, but without undermining the economy's ability to sustain growth and perform its other important functions.

The challenge is therefore not necessarily to prevent all financial problems from arising. It is not practical to expect that a dynamic and effective financial system would avoid instances of market volatility and turbulence, or that all financial institutions would be capable of perfectly managing the uncertainties and risks involved in providing financial services and enhancing financial stakeholder value. In addition, it would be undesirable to create and impose mechanisms that are overly constraining of the risk-taking of financial institutions or exceedingly protective of financial market stability. Constraints could prove to be so intrusive and inhibiting that they could reduce the extent of risk-taking to the point where economic efficiency is inhibited. Moreover, the mechanisms of protection or insurance could, if poorly designed and implemented, prove counterproductive by creating the moral hazard of even greater risk-taking.

The above quotation "*but without undermining the economy's ability to sustain growth and perform its other important functions*" is an important aspect of the challenge of financial stability. The achievement and maintenance of financial stability should be balanced against other, arguably higher priority, objectives such as economic efficiency. This reflects the notion that finance is not an end in itself but plays a supporting role in improving the ability of the economic system to perform its functions.

2 The approach discussed draws heavily on the framework developed in A. Houben, J. Kakes and G. Schinasi (2004), "Toward a Framework for Safeguarding Financial Stability", IMF Working Paper, No 04/101; G. Schinasi (2003), "Responsibility of Central Banks for Stability in Financial Markets", IMF Working Paper, No 03/121; G. Schinasi (2004a), "Private Finance and Public Policy", IMF Working Paper, No 04/120; G. Schinasi (2004b), "Defining Financial Stability", IMF Working Paper, No 04/187; and G. Schinasi (2005), "Safeguarding Financial Stability: Theory and Practice", IMF, forthcoming.

EFFICIENCY AND STABILITY

That the challenge is a balancing act can be seen by considering that the likelihood of systemic problems could be limited in practice by designing a set of rules and regulations that restrict financial activities in such a way that the incidence or likelihood of destabilising asset price volatility, asset market turbulence or individual bank failures could be eliminated. However, it is also likely that this type of "stability" would be achieved at the great expense of economic and financial efficiency.

This reasoning leads to the impression, if not conclusion, that there is an ex ante trade-off between achieving on the one hand economic and financial efficiency, and on the other economic and financial stability. That is, if the concern is solely with stability, then it may be possible to achieve and maintain this by trading off some efficiency.

The possibility of an ex ante trade-off can be illustrated by narrowing the definitions of stability and efficiency. Consider a market for a good whose price is sensitive to incoming information. This characterises many asset prices. In principle, the variability of an asset price could be limited by imposing restrictions in the market that would inhibit the ability of traders to price in every small piece of information. But from a trader's and investor's perspective, such restrictions would inhibit the efficiency of the market's ability to price and allocate resources in the presence of uncertainty.

On the other hand, it is possible to try to maintain efficiency, and even enhance it, while at the same time allowing the financial system room to innovate, evolve and better support the economic system. If the cost of doing so is greater asset price volatility or capital flow volatility, society must decide which point along this trade-off should be chosen. This issue goes beyond the scope of this special feature, however.

THE NEED FOR A SYSTEMIC APPROACH

The challenge of achieving and maintaining financial stability is broader than, and in fact encompasses, the need to limit the impact of asset price instability on the functioning of the overall financial system. In fact, if the financial system is stable, then it will be able to tolerate higher levels of asset price volatility, as well as other financial problems, including those in financial institutions. To jump immediately to the highest level of generality, the challenge of financial stability can be seen as managing the risk of a system-wide problem, or what is known as systemic financial risk, a concept that will be defined more rigorously towards the end of what follows in the next section.

KEY ELEMENTS FOR A FRAMEWORK

The notion of a framework used in this special feature is that of a set of definitions, concepts, and organising principles that impose discipline on the analysis of the financial system. An effective framework would seem to require three important standards. First there must be rigorous definitions and understanding of key concepts, such as what is meant by the terms *financial system*, *financial stability* and *instability*, and systemic, to name just a few. Second, to be most useful for monitoring and policy, the framework's concepts and definitions ultimately must be either directly measurable or correlated with measures: in other words, the concepts and definitions must have useful and policy-relevant empirical counterparts. Third, the set of definitions, concepts and organising principles, along with their empirical counterparts, must serve the purpose of ensuring internal consistency in the identification of sources of risks and vulnerabilities and in the design and implementation of policies aimed at resolving difficulties should they emerge.

What is meant by the "financial system"? Broadly, the financial system can be seen as comprised of three separable but closely related components. First, there are financial intermediaries that pool funds and risks and then allocate them to their competing uses. Increasingly, financial institutions provide a

range of services, and not just the traditional banking services of taking deposits and making loans. Institutions such as insurance companies, pension funds, hedge funds and financial/non-financial hybrids now supply a range of financial services. Second, there are financial markets that directly match savers and investors, for example, through the issuance and sale of bonds or equities directly to investors. Third, there is the financial infrastructure, comprised of both privately and publicly-owned and operated institutions – such as clearance, payment and settlement systems for financial transactions – as well as monetary, legal, accounting, regulatory, supervisory and surveillance infrastructures.[3] Notably, both private and public persons participate in financial markets and in vital components of the financial infrastructure. Governments borrow in markets, hedge risks, operate through markets to conduct monetary policy and maintain price stability, and own and operate payment and settlement systems. Accordingly, the term "financial system" encompasses both the monetary system with its official understandings, agreements, conventions and institutions, as well as the processes, institutions and conventions of private financial activities.[4] Any analysis of how the financial system works and how well it is performing its key functions requires an understanding of these components.

What is meant by the term "financial stability"? There is as yet no widespread agreement on a useful working definition of financial stability. Some authors prefer to define financial *instability* rather than stability[5], while others prefer to define the problem in terms of managing systemic risk rather than as maintaining or safeguarding financial stability. Consistent with some aspects of these alternative definitions, Schinasi (2004b) proposes and analyses a definition of financial stability that has three important characteristics. First, the financial system efficiently and smoothly facilitates the intertemporal allocation of resources from savers to investors and the allocation of economic resources generally. Second, forward-looking financial risks are being assessed and priced reasonably accurately and are also relatively well managed. Third, the financial system is in such a condition that it can comfortably if not smoothly absorb financial and real economic surprises and shocks. If any one or a combination of these characteristics is not being maintained, then it is likely that the financial system is moving in the direction of becoming less stable, and at some point might exhibit instability. For example, inefficiencies in the allocation of capital or shortcomings in the pricing of risk can, by laying the foundations for imbalances and vulnerabilities, compromise future financial system stability.

All three of these aspects of the definition can and do entail both endogenous and exogenous elements. For example, surprises that can impinge on financial stability can emanate both from within and outside the financial system. Moreover, the intertemporal and forward-looking aspects of this particular way of defining financial stability serve to emphasise that threats to financial stability arise not only from shocks or surprises but also from the possibility of disorderly adjustments of imbalances that have built up endogenously over a period of time – because, for example, expectations of future returns were misperceived and therefore mispriced.[6]

3 On the role of the legal system see, for example, R. Levine (1999), "Law, Finance and Economic Growth", *Journal of Financial Intermediation,* 8, pp. 8-35; M. Leahy, S. Schich, G. Wehinger, F. Pelgrin and T. Thorgeirsson (2001), "Contributions of Financial Systems to Growth in OECD Countries", OECD Working Paper, No 280, and T. Beck, A. Demirgüç-Kunt and R. Levine (2003), "Bank Concentration and Crises", NBER Working Paper, No 9921.

4 This particular formulation is an adaptation of "international financial system" in E. Truman (2003), "Inflation Targeting in the World Economy", Institute for International Economics, Washington.

5 See, for example, the survey of definitions of financial stability in Schinasi (2004b) or Houben, Kakes, and Schinasi (2004). A typology of instability is developed in E. P. Davis (2002), "A Typology of Financial Instability", Financial Stability Report, 2, Oesterreichische Nationalbank.

6 That financial stability should not be thought of simply as a static concept of shock absorption capacity has been emphasised, among others, in H. M. Minsky (1982), *Inflation, Recession and Economic Policy* (Wheatsheaf, Sussex: MIT Press), and in C. P. Kindleberger (1996), *Manias, Panics and Crashes* (Cambridge: Cambridge University Press).

There are several important implications of defining financial stability in this way. First, judgements about the performance of the financial system entail how well the financial system is facilitating economic resource allocation, the savings and investment process, and ultimately economic growth. There are two-way linkages: the real economy can be positively or negatively affected by the financial system, and the performance of the financial system can be affected by the performance of the real economy. A framework that can assess financial stability must pay attention to these linkages.

Disturbances in financial markets or at individual financial institutions need not be considered threats to financial stability if they are not expected to impair overall economic activity. In fact, the incidental closing of a (minor) financial institution, a rise in asset price volatility, and sharp and even turbulent corrections in financial markets may be the result of competitive forces, the efficient incorporation of new information, and the economic system's self-correcting and self-disciplining mechanisms. By implication, in the absence of contagion and the high likelihood of systemic effects, such developments may be viewed as welcome – if not healthy – from a financial stability perspective. Just as in Schumpeterian business cycles, where the adoption of new technologies and recessions have both constructive and destructive implications, a certain amount of instability can be tolerated from time to time because it may encourage long-term financial system efficiency.[7]

Second, financial stability is a broad concept, encompassing the different aspects of the financial system, namely infrastructure, institutions and markets. Because of the interlinkages between these components, expectations of disturbances in any one component can affect overall stability, requiring a systemic perspective. Consistent with the definition of the financial system, at any given time stability or instability could be the result of either private institutions and actions, or official institutions and actions, or both simultaneously and/or iteratively.

Third, financial stability not only implies that the financial system adequately fulfils its role in allocating resources, transforming and managing risks, mobilising savings and facilitating wealth accumulation and growth, but also that within this system the flow of payments throughout the economy functions smoothly (across official and private, retail and wholesale, and formal and informal payment mechanisms). This requires that money – both central bank money and its close substitute, derivative monies (such as demand deposits and other bank accounts) – adequately fulfils its role as a means of payment and a unit of account and, when appropriate, as a (short-term) store of value. In other words, financial stability and what is usually regarded as a vital part of monetary stability overlap to a large extent.[8]

Fourth, financial stability requires the absence of financial crises and the ability of the financial system to limit and deal with the emergence of imbalances before they constitute a threat to stability. In a well-functioning and stable financial system, this occurs in part through self-corrective, market-disciplining mechanisms that create resilience and endogenously prevent problems from festering and growing into system-wide risks. In this respect, there may be a policy choice between allowing market mechanisms to work to resolve potential difficulties and intervening quickly and effectively – through liquidity injections via markets, for example – to restore

7 See J. Schumpeter (1934), *The Theory of Economic Development* (Cambridge, MA: Harvard University Press).

8 For discussions of the role of central banks in financial stability see T. Padoa-Schioppa (2003), "Central Banks and Financial Stability: Exploring a Land in between", in V. Gaspar, P. Hartmann and O. Sleijpen (eds), *The Transformation of the European Financial System* (Frankfurt: ECB), and Schinasi (2003). On the interplay between monetary and financial stability see, for instance, O. Issing (2003), "Monetary and Financial Stability - Is There a Trade-off?", speech delivered at the Conference on Monetary Stability, Financial Stability and the Business Cycle, BIS, Basel, 28-29 March.

risk-taking and/or to restore stability. Thus, financial stability entails both preventive and remedial dimensions.

Last, but not least important, financial stability can be thought of as occurring along a continuum, reflecting different possible combinations of conditions of the financial system's constituent parts. One implication of seeing financial stability in this way is that maintaining financial stability does not necessarily require that each part of the financial system operates persistently at peak performance; it is enough for the financial system to operate on a "spare tyre" from time to time.[9]

The concept of a continuum is relevant because finance fundamentally involves uncertainty, is dynamic (i.e. it is both intertemporal and innovative), and is composed of many interlinked and evolutionary elements (e.g. infrastructure, institutions, markets, etc.). Accordingly, financial stability is expectations-based, dynamic, and dependent on many parts of the system working reasonably well. What might represent stability at one point in time might be more stable or less stable on another occasion, depending on other aspects of the economic system, such as technological, political, and social developments. Moreover, financial stability can be seen as being consistent with various combinations of the conditions of its constituent parts, such as the soundness of financial institutions, financial market conditions, and the effectiveness of the various components of the financial infrastructure.

What is meant by systemic risk? According to the G10 Report on financial consolidation and risk,

"*Systemic financial risk is the risk that an event will trigger a loss of economic value or confidence in, and attendant increases in uncertainty about, a substantial portion of the financial system that is serious enough to quite probably have significant adverse effects on the real economy. Systemic risk events can be sudden and unexpected, or the likelihood of their occurrence can build up through time in the absence of appropriate policy responses. The adverse real economic effects from systemic problems are generally seen as arising from disruptions to the payment system, to credit flows, and from the destruction of asset values*."[10]

The G10 study notes that this definition encompasses much of what is in the literature, but is stricter in two respects. One is that the negative externalities of a systemic event extend into the real economy, and are not confined to the financial system. The second is that this extension into the real economy occurs with a relatively high probability. The emphasis on real effects reflects the view that it is the output of real goods and services and the accompanying employment implications that are the primary concern of economic policymakers. "In this definition, a financial disruption that does not have a high probability of causing a significant disruption of real economic activity is not a systemic risk event."

Taken together, a good understanding of what is meant by financial stability and what is meant by financial instability can serve to define boundaries around the scope of the analysis. The safeguarding of financial stability should not be understood as a zero tolerance of bank failures or of an avoidance of market volatility, but it should avoid financial disruptions that lead to real economic costs.[11]

9 See A. Greenspan (1999), "Do Efficient Markets Mitigate Financial Crises?", speech delivered before the 1999 Financial Markets Conference of the Federal Reserve Bank of Atlanta.

10 See G10 (2001), "Consolidation of the Financial Sector", Basel.

11 Papers that focus on aspects of systemic risk include O. De Bandt and P. Hartmann (2000), "Systemic Risk: A Survey", ECB Working Paper, No 35; D. Hoelscher and M. Quintyn (2003), "Managing Systemic Banking Crises", IMF Occasional Paper, No 224, and M. Summer (2003), "Banking Regulation and Systemic Risk", *Open Economies Review,* 14, pp. 43-70.

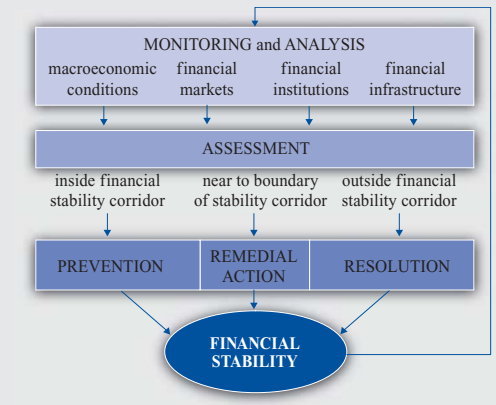
ASSESSING FINANCIAL STABILITY

With working definitions of the financial system, financial stability and systemic risk in hand, it is now possible to discuss the key role of financial stability assessments in safeguarding financial stability. The core objectives of a framework for safeguarding financial stability are the *prevention* and *resolution* of systemic financial problems. That is, safeguarding financial stability fundamentally requires a framework to *prevent* problems from occurring and/or to *resolve* problems if prevention fails.

A key to prevention is the early identification of risks to stability and of potential sources of vulnerability in the financial system before they lead to unsustainable and potentially damaging imbalances and consequences. For example, weaknesses and vulnerabilities could exist in any of the components of the financial system – institutions, markets, infrastructure – and could entail all three simultaneously. Along with identifying potential sources of risks and vulnerabilities, it is also desirable to attempt to calibrate their intensity and potential for (or probability of) leading to financial system problems and possible systemic effects. Accordingly, financial stability assessments are a key part of prevention.

The key to resolution is to have mechanisms in place and policy tools available to remedy situations in which the financial system seems to be in the early stages of moving towards instability. Such tools would include moral suasion and intensified supervision and/or market surveillance, for example. Should remedial measures fail, or undetected endogenous factors or unanticipated exogenous factors lead to instability, tools should be available for resolving problems and instabilities quickly and with minimum collateral damage, either to the financial system or the economy. Such tools would include emergency liquidity assistance.

Figure A.1 Framework for maintaining financial system stability



Source: Houben, Kakes and Schinasi (2004).

Figure A.1 presents a schematic diagram that might be considered as a reasonable model of such a framework for prevention and resolution.

In order to prevent problems from occurring or becoming significant enough to pose a risk to financial stability, it would be desirable if the approach taken were to entail a continuous process of information gathering, technical analysis, monitoring and assessment. Because of the linkages between the real economy and the financial system, and also the various components of the financial system, this continuous process would be most useful if it encompassed both economic and financial dimensions, as well as institutional knowledge about institutions, markets and the financial infrastructure. In effect, the process needs to be comprehensive and analytical (see the top bar in Figure A.1). It should be noted that ongoing and more fundamental research into the changing structure of the financial system and its changing linkages to the real economy, as well as the further development of measurement techniques for detecting growing imbalances and calibrating risks and vulnerabilities, are vital for keeping this important monitoring phase up to date.

The process entails gathering information about, and monitoring, conditions in the macroeconomy (and at times microeconomic aspects as well) and the various aspects of the financial system through supervisory, regulatory and surveillance mechanisms. Each of the financial system monitoring components could entail both macro and micro-prudential characteristics.

For example, when it comes to gathering information about financial stability risks in the banking system, the supervisory process could be aided by knowledge about where the economy is with regard to the business and credit cycles and how markets have been performing overall: the reason being that the macroeconomy and markets provide the background against which the operational performance of the banking system should be assessed. Likewise, an assessment of the condition of financial markets could differ depending on whether the major institutions operating in the markets are well capitalised and profitable or not.

The reason for gathering information, analysing it, and continuously monitoring the various components of, and influences on, the financial system is to make systematic and periodical assessments of whether the financial system is more or less performing its main functions well enough to be judged to be within a corridor of financial stability along the continuum discussed earlier. Such an assessment could lead to three conclusions, each of them with quite different implications for action (see the middle bar in Figure A.1 labelled *assessment*, plus the arrows). The financial system can be judged as either being in a zone or corridor of financial stability, as approaching a boundary of stability/instability, or as being 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-correcting processes and mechanisms are assessed as being likely to move the system back toward the corridor of stability or alternatively to need prompt remedial and even emergency measures to reverse the instability.[12]

Financial conditions and potential difficulties could also be delineated according to their intensity, scope and potential threat to systemic stability. For example, potential financial difficulties can be thought of as falling into one of the following fairly broad categories:

– difficulties in a single institution or market not likely to have system-wide consequences for either the banking or financial system;

– difficulties that involve several relatively important institutions involved in market activities with some non-trivial probability of spillovers and contagion to other institutions and markets; and

– problems likely to spread to a significant number and types of financial institutions and across usually unrelated markets for managing liquidity needs, such as forward, interbank and even equity markets.

Problems occurring within each of these categories would require different diagnostic tools and policy responses, ranging from taking no action to intensifying supervision or surveillance of a specific institution or market, to liquidity injections into the markets to dissipate strains, or to interventions into particular institutions.

CONCLUDING REMARKS

Taken together, a good understanding of what is meant by financial stability and financial instability can serve to define boundaries around the scope of monitoring and assessing financial stability. Financial stability is complex to define and should not only be seen from the perspective of avoiding financial crises. Financial stability

12 As Kindleberger (1996) puts it, "markets work well, on the whole, and can normally be relied upon to decide the allocation of resources and, within limits, the distribution of income, but […] occasionally markets will be overwhelmed and need help".

also has a positive dimension. It is a condition where the financial system is capable of performing all of its normal tasks well and where it is expected to do so for the foreseeable future. From this viewpoint, financial system stability requires that the principal components of the system – 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 accurately, and that risks are efficiently managed. In addition, financial stability has an important forward-looking dimension: inefficiencies in the reallocation of capital or shortcomings in the pricing of risk can, by laying the foundations for future vulnerabilities, compromise future financial system stability, and therefore economic stability. While this definition suggests that financial stability analysis is wide in scope, a definition of systemic risk can help in narrowing it down by focusing monitoring and assessment activities on the risks of financial disruptions that have a high probability of impairing real economic activity.

B INDICATORS OF FINANCIAL DISTRESS IN MATURE ECONOMIES

This special feature analyses the indicator properties of macroeconomic variables and aggregated financial statements from the banking sector in providing early signals of distress in the banking sector. Identifying leading indicators of financial distress is important when assessing systemic risk within a broader financial stability analysis. An empirical model is estimated using data for 15 mature countries over the period 1980-2001. The analysis suggests that low economic activity, high domestic credit growth, rapid growth in property prices, as well as low profitability and low liquidity in the banking sector, have good properties as leading indicators of financial distress.

INTRODUCTION

The series of costly banking crises that occurred in mature economies in the 1980s and 1990s revealed the need to formalise a framework for analysing the current condition and risk absorption capacity of the banking system as a whole. The indicators that have emerged for this type of analysis in the ESCB are known as macro-prudential indicators.[1] In order to take full advantage of these indicators in empirically assessing the degree of systemic risk in the banking sector, it is essential to identify those economic variables that can warn of impending distress in advance. This special feature aims at assessing the leading indicator properties of a range of macroeconomic variables and aggregate information extracted from bank financial statements in order to predict the likelihood of financial distress in the banking sectors of mature economies.

In assessing the properties of leading indicators, the main objective of the analysis is to highlight some common factors that have been observed prior to the emergence of distress in the banking sector. The analysis focuses on episodes of distress that occurred in the 1980s and 1990s in 11 selected mature economies. Due to the relatively short time series available, the limited number of countries considered and the structural changes in the analysed countries in this period, the findings should be interpreted with caution. In particular, there is no guarantee that the set of explanatory factors or their reaction pattern will remain constant over time.

DATING EPISODES OF FINANCIAL DISTRESS

The approach taken to defining and dating episodes of financial distress in the banking sector can be subject to some degree of individual judgement. For instance, financial distress could be defined as a full-blown banking crisis involving many or all banks in the financial system of a given economy (i.e. a systemic crisis). The definition could be extended to include more borderline events and non-systemic crises such as those involving only some institutions, with the banking system as a whole remaining solvent. However, such restricted definitions would not necessarily capture the systemic nature of crisis that is the focus of macro-prudential analysis. Due to the difficulties in dating the financial crises, the setting up of a single measure for financial distress poses some challenges.[2]

The most commonly used method of identifying financial distress in the literature is the event method.[3] This method identifies and classifies certain events in the economy on the basis of some predefined criteria. These events are then mapped into a binary variable. For instance, for conditions of distress in the banking system, a simple measure could be classified as 0, indicating no distress, or 1, indicating distress. For practical

1 For further information on the macro-prudential analyses performed by the ECB, see L. Mörttinen, P. Poloni, P. Sandars and J. Vesala (2005), "Analysing Banking Sector Conditions – How to Use Macro-prudential Indicators", ECB Occasional Paper, No 26.

2 See A. Houben, J. Kakes and G. Schinasi (2004) "Towards a framework for financial stability", De Nederlandsche Bank Occasional Studies, Vol. 2(1).

3 Another approach using information about banks' demand for central bank reserves in the money market is suggested by T. Ho and J. von Hagen (2004), "Money Market Pressure and the Determinants of Banking Crises", Centre for Economic Policy Research, Discussion Paper, No 4651.

implementation, the most common approach used to define events of financial distress is based on the use of indicators such as high levels of non-performing loans to total assets in the banking sector, bank runs that lead to bank closures, mergers or takeovers by the public sector of one or more financial institutions, deposit freezes, prolonged bank holidays and the high cost of rescue operations.[4]

In the empirical estimation conducted for this special feature, a panel of 15 mature countries was used.[5] Four of the included countries did not experience a period of severe financial distress, and thus serve as a control group. A broad range of macroeconomic variables describing the general economic environment is analysed. As for the banking sector, annual aggregate financial statements are used. The choice of an annual data frequency for the empirical work reflects the difficulty of obtaining aggregate banking sector financial statements at a higher frequency.

IDENTIFYING LEADING INDICATORS OF FINANCIAL DISTRESS

STYLISED FACTS OF DISTRESS

The first step towards identifying leading indicators of financial distress is to examine the stylised facts of potential indicators around distress periods. The variables chosen for this analysis are those commonly considered in the literature. Many economic variables show distinct patterns in the run-up to and during episodes of financial distress. Charts B.1 to B.4 show the evolution of various indicators prior to, during and after episodes of distress. Only the 11 countries that experienced distress – as defined by the event method – are used for this analysis.

Adverse developments in the real economy have in the past tended to precede episodes of distress. In particular, real GDP growth declined on average prior to episodes of distress (see Chart B.1).

Most of the countries in the sample experienced high growth rates in real credit and rising property prices prior to episodes of financial distress (see Chart B.2).[6] Crises tend to erupt, on

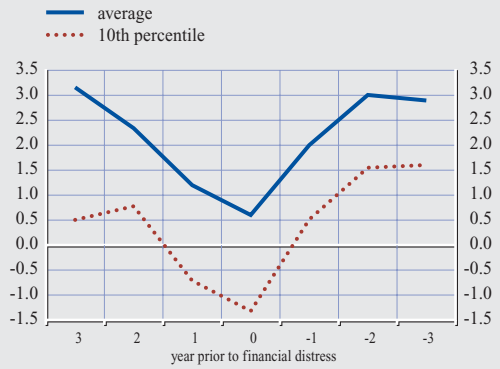
4 A list of periods of financial distress and the dating of these using the event method can be found in G. Caprio and D. Klingebiel (2003), "Episodes of Systemic and Borderline Financial Crises", World Bank.

5 The countries included with distress periods denoted in parenthesis are Belgium (no distress), Denmark (1990-92), Finland (1991-94), France (1994-95), Germany (no distress), Greece (1991-95), Italy (1992-95), Japan (1991-01), the Netherlands (no distress), Norway (1988-93), Portugal (no distress), Spain (1993), Sweden (1990-93), the UK (1990-92) and the US (1984-91).

6 The chart shows growth rates in excess of estimated trends.

Chart B.1 Real GDP per capita growth around periods of financial distress

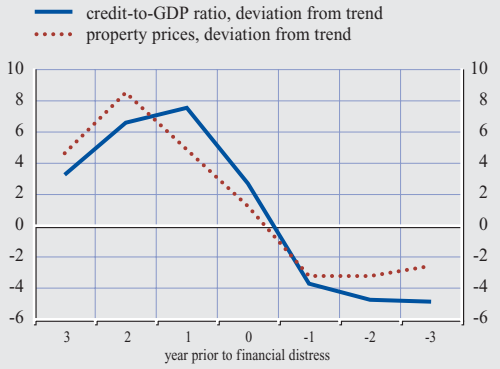
(% per annum)



Sources: OECD, IMF and ECB.
Note: The chart shows the average of the 11 countries in the panel that experienced financial distress.

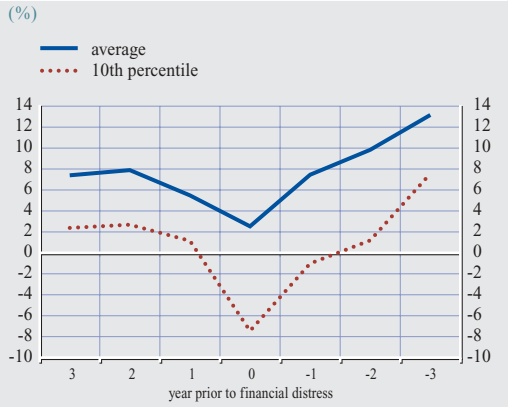
Chart B.2 Domestic credit growth and residential property price changes around periods of financial distress

(% points)



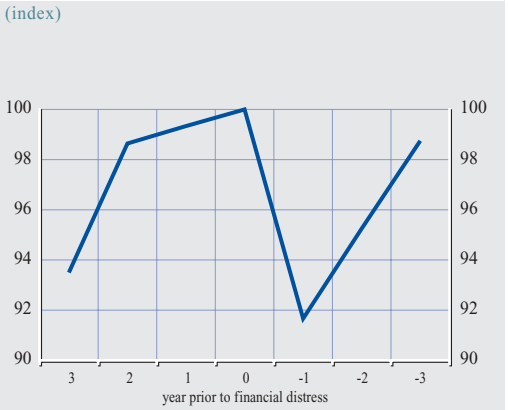
Sources: IMF, BIS and ECB.
Note: The trends in the time series were calculated using a Hodrick-Prescott filter. The chart shows the average of the 11 countries in the panel that experienced financial distress.

Chart B.3 Banking sector return on equity (ROE) around periods of distress



Sources: OECD and ECB.
Note: The chart shows the average of the 11 countries in the panel that experienced financial distress.

Chart B.4 Banking sector loans to non-bank deposits around periods of financial distress



Sources: OECD and ECB.
Note: The ratio of non-bank loans to non-bank deposits has been set to 100 in the first year with financial distress. The chart shows the average of the 11 countries in the panel that experienced financial distress.

average, two (one) years after deviations from trend in property prices (credit growth) have peaked. It therefore seems that the financial sector is most vulnerable to developments in credit and property prices after the turning point in these indicators has been passed. This is very much in line with the findings of previous studies. Some of the banking crises experienced in the 1980s and 1990s, such as those in the Nordic countries, were characterised by lending booms following a widespread deregulation of the banking sector, surges in asset prices and over-expansion of credit. As asset prices started to correct, typically amid an economic slowdown, banks tended to be hit by rapidly deteriorating asset quality and credit losses.

To account for conditions within the banking sector, aggregate financial statement information of banks on profitability, liquidity and capital adequacy were also used. Prior to distress, patterns in the aggregate ROE in particular have tended to be consistent across the analysed countries. On average the ROE declined prior to episodes of distress, even turning negative in some countries (see Chart B.3).

Liquidity conditions in the banking sector can be gauged using the ratio of non-bank loans to non-bank deposits. This indicator covers the banking sector's dependency on funding lending activities. An increasing gap between funding needs and the availability of customer deposits tends to show that the banking sector is becoming more dependent on alternative, more expensive, funding sources such as the interbank market. On average, this gap increased in the three years prior to episodes of distress in the 11 countries (see Chart B.4).

IDENTIFYING LEADING INDICATORS

To investigate whether the variables described above can effectively capture the build-up of crises and are capable of providing an early signal of distress, a standard logistic regression model was specified (see Box B.1). In the regressions, the four countries that did not experience episodes of distress were included as a control group.

Table B.1 shows the variables included in the estimated model, together with the signs and significance of the estimated coefficients. A positive sign indicates an increased likelihood of experiencing an episode of distress for higher values of the explanatory variable in question. Five variables were identified in the model as providing significant indications of

Box B.1

METHODOLOGY

In order to conduct the empirical work, a panel of 15 countries was set up with annual data from 1980 to 2001. A standard logistic regression model was estimated. In these models, the endogenous variable is binary (0 or 1). In each year the country is either experiencing an episode of distress, in which case the endogenous variable in this model takes the value 1, or 0 if not. Only the first year of distress in a country is recorded as an episode of distress, even if the crisis lasts longer. This procedure is performed in order to avoid the risk of potential feedback effects on the indicators: during episodes of distress, some of the variables might be affected by the distressed period itself. The probability of a future episode of financial distress is assumed to be a function of different explanatory variables. These variables are lagged by one year to investigate whether they are capable of producing satisfactory signals of future distress in the banking sector. Apart from capturing leading indicator properties, lagged explanatory variables also alleviate the potential endogeneity problems typically present in regressions with simultaneous variables. Different techniques were applied to account for structural differences between countries and to highlight the build-up of financial imbalances in the banking sector. The model estimation can be interpreted as the probability of experiencing financial distress within the following year. Such probabilities have to be interpreted with care; the analysis should focus on the trends rather than on absolute measures.

financial distress. These estimations broadly support the empirical findings in the previous section.

First of all, the model estimations confirm that the risk of severe problems in the banking sector increases at times of low real economic activity as measured by growth in real GDP. In addition, high credit to GDP and high real property prices both increase the likelihood of financial distress in the banking sector. It is important to note that increasing credit activity or rising property prices need not per se necessarily constitute a threat to the stability of the banking sector. However, the literature emphasises that fast credit growth combined with rapid increases in asset prices might increase the vulnerability of banks to crises.[7]

Variables that capture banks' profitability, liquidity and capital adequacy were included as explanatory variables of financial distress. Low profitability in the banking sector, measured by ROE, proved to be significant as a leading indicator of episodes of financial distress.[8] As a measure of banking sector liquidity conditions, the ratio of non-bank loans to non-bank deposits was found to be significant with a positive sign in the model.[9]

Table B.1 Leading indicators of distress

Indicators	Sign	Significance
Growth in GDP per capita (real)	-	significant
Domestic credit to GDP (real)	+	significant
Residential property prices (real)	+	significant
Banking sector return on equity	-	significant
Banking sector loans to non-bank deposits	+	significant
Banking sector lending rate	+	insignificant
Banking sector capital adequacy	+	insignificant

Sources: IMF, OECD, BIS and ECB.
Note: Domestic credit to GDP and residential property prices are jointly included in the model.

7 See C. Borio and P. Lowe (2002), "Asset Prices, Financial and Monetary Stability: Exploring the Nexus", BIS Working Paper, No 114.

8 It should be highlighted that ROE does not take into account the level of risk associated with the generated income.

9 Several indicators covering the direct liquidity (i.e. liquid assets to total assets) in the banking sector were analysed, but no general pattern was discovered.

To capture the banking sector's assessment of credit risk, the spread between the banking sector's lending rate and a proxy for the risk-free rate was analysed. This indicator tends to increase prior to episodes of financial distress, possibly reflecting a deterioration in the credit quality of borrowers; however, it was not found to be statistically significant in the empirical estimations. *A priori*, it might be expected that low levels of capital adequacy in the banking sector would be observed prior to periods with financial distress, yet this effect was, in general, not supported by the empirical evidence in the analysed sample. However, this does not mean that capital adequacy should not be monitored on an ongoing basis. This is because banks' earnings affect capital adequacy, and it cannot be ruled out that the effect could be accounted for through the profitability measure.

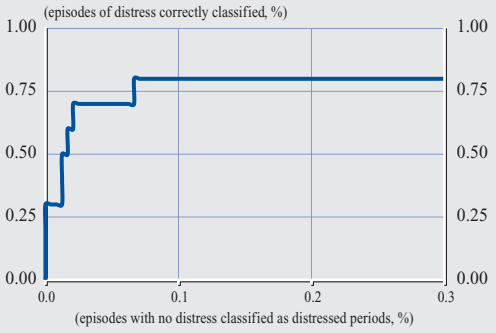
In the sample considered, exchange rate regimes have often played an important role, and in some cases currency crises and banking crises have erupted simultaneously. Sharp moves in the exchange rate, particularly devaluations of exchange rate pegs, could thus work as a leading indicator of financial distress. Estimations corroborate the fact that currency crises and banking crises often coincide. However, there was no evidence that sharp moves in the exchange rate were leading indicators of financial distress for the mature economies considered.

CLASSIFYING PERIODS OF DISTRESS

The estimated coefficients of the model can be interpreted as probability measures. To distinguish between situations of distress and no distress in the banking sector, it is necessary to determine a threshold for the estimated probability. If the estimated probability is higher (lower) than a predetermined threshold probability, a signal (no signal) is provided. Determining the threshold naturally involves a trade-off. On the one hand, setting the threshold too low produces many false signals, whereas most periods of distress are captured. On the other hand, setting the threshold higher reduces the number of false alarms, but with the risk that some of the episodes are missed. Chart B.5 illustrates this trade-off in the estimated model. The proportion of distress episodes that the model captures is measured on the vertical axis. The horizontal axis shows the proportion of years where the model signals distress but no distress was in fact observed. The curve depicts the relationship for the range of thresholds.

Chart B.5 Trade-off between classifying as distress and misclassifying as no distress

(probability of an episode of distress)



Source: ECB calculations.

In practice, policymakers will put different weights on the two types of misclassification. In the data considered, a neutral threshold would be 4%, which is the frequency of distress periods in the sample. Based on this threshold, the model correctly classifies 84% of the observations in the sample. Decomposing this for the different states, the model correctly predicts 80% of episodes of distress and 84% of the years where no distress occurred.

CONCLUDING REMARKS

Combining analyses of macroeconomic imbalances together with information on the condition of balance sheets in the banking sector can provide early warnings of impending financial distress. The implications of these findings are clear. In particular, they underline the importance of central banks carrying out periodic macro-prudential analyses. Even though distress in the banking sector to some

extent can and has been triggered by idiosyncratic incidents, several common factors in the countries examined can be observed. This calls for these factors to be analysed on a systematic basis when assessing the degree of systemic risk facing the banking sector. This notwithstanding, it cannot be excluded that the set of indicators that drive banking sector crises could change over time. Structural changes such as the development of risk management techniques and increased activity in derivatives markets by financial institutions might have changed the importance of some of the identified variables as leading indicators.

C ASSESSING THE DETERMINANTS OF FINANCIAL DISTRESS IN FRENCH, ITALIAN AND SPANISH FIRMS[1]

Knowledge of the determinants of financial distress in the corporate sector can provide a useful foundation for analysing the degree of credit risk facing banks, and represents a key input for assessing risks and vulnerabilities to financial stability. This special feature examines the determinants of corporate failure in Italian, Spanish and French SMEs in order to shed light on whether the predictors of financial distress in these countries are the same or not. This is done by estimating models for each of these countries and a common model for the three. This allows an assessment of the differences in the determinants of financial distress and in the predictive ability of the two model set-ups.

INTRODUCTION

An important part of financial stability analysis entails assessing the degree of corporate sector credit risk facing banks. For financial stability analysis on a euro area-wide basis, it is important to ascertain whether common or country-specific factors drive corporate failures. If the factors that give rise to financial distress are the same across countries, then aggregation of individual corporate sectors into a single group is justified, whereas if country-specific factors are more important, this would call for analysing conditions in each individual corporate sector. Moreover, such issues are also relevant for the risk management practices of individual credit institutions. The Revised Framework for Capital Measurement and Capital Standards, also known as Basel II, opens up the possibility that credit institutions themselves can estimate their minimal capital requirements. According to Basel II, credit institutions can choose between one of two internal ratings-based approaches when they calculate their capital requirements.[2] If they choose to do so and follow one of the two internal ratings-based approaches, they need to assess the probability of default of their obligors in order to calculate their minimal capital requirements. As many credit institutions in Europe operate on a cross-border basis, the choice between setting up individual country credit scoring models or a common credit scoring model is a highly relevant one. In order to shed light on these questions, the determinants of corporate failure in French, Italian and Spanish firms are investigated.

Financial stability analysis of non-financial firms usually involves examining conditions in SMEs as well as large companies separately. In order to assess the financial health of large companies, a number of information sources are available, such as credit ratings and market-based indicators such as EDFs. However, these sources are not available for most SMEs. Instead, the analysis of SMEs usually relies on company accounts. For this special feature, income statement and balance sheet information was collected for SMEs in France, Italy and Spain, and accounting-based credit scoring models were estimated for each country.[3] An accounting-based credit scoring model is a model which, on the basis of information extracted from company accounts, and perhaps also non-financial information (such as the age of the company), estimates the probability that a particular firm will default on its debt obligations, usually over a one-year horizon.

In contrast to other studies, which also compare the determinants of corporate failure across countries, this study focuses on countries that are fairly similar in some important aspects.

1 This special feature draws heavily on A. D. Rommer (2005), "A Comparative Analysis of the Determinants of Financial Distress in French, Italian and Spanish Firms", Danmarks Nationalbank Working Paper, No 26; and A. Dyrberg (2004), "Firms in Financial Distress: An Exploratory Analysis", Danmarks Nationalbank Working Paper, No 17.

2 For further details, see Basel Committee on Banking Supervision (2004), "International Convergence of Capital Measurement and Capital Standards: A Revised Framework", BIS, June.

3 In the case of other large countries, such as Germany, data have a survivorship bias, and could therefore not be meaningfully included.

The three countries all belong to continental Europe, are a part of EMU, and their legal traditions are all inspired by the French Commercial Code.[4] Furthermore, despite the deregulation and financial liberalisation process which took place in these countries in the 1980s and 1990s, banks remain very important sources of financing in all three.

DATA AND METHODOLOGY

The data used for Italy, Spain and France were obtained from the Amadeus database provided by Bureau van Dijk. As opposed to most Italian, Spanish and French credit scoring models presented in the literature, which use non-public information from credit registries operated by governments (usually by bank supervisors) or from other non-public sources (such as banks), the analysis uses purely public information.

Several sample selection criteria are applied to the raw data in order to identify a homogeneous group of firms across countries. Some of the important sample selection criteria screen the data to ensure that only SMEs that are public or private limited liability companies are analysed. The definition of SMEs adopted follows the European Commission definition of an SME where a firm should have at least 10 employees and have total assets of at least 2 million euro up to a limit of 250 employees and total assets of 43 million euro. The lower-bound criterion ensures that micro-companies, which resemble households, are excluded from the sample, and furthermore, that only "truly" active companies are analysed. The upper-bound criterion ensures that the analysed group of firms is fairly homogeneous.

The dependent variable is the exit type as recorded in the Amadeus database. Firms can exit for the following reasons: 1) corporate distress, 2) voluntary liquidation, 3) mergers and acquisitions and 4) inactive (no precision). Corporate distress is defined as a condition where firms have either gone bankrupt or where active firms are in receivership. Voluntary liquidations and mergers and acquisitions are self-explanatory. The final category, inactive (no precision), consists of firms that are known to have exited the database, but not why they did so.

As firms can exit to these various mutually exclusive states, the credit scoring model to be estimated is a competing risks model. The competing risks model estimates simultaneously the probability that a firm will exit to each of the states (financial distress, voluntary liquidation, etc.).[5] The estimation delivers four equations, from which the determinants of corporate distress, voluntary liquidations, mergers and acquisitions and the group inactive (no precision) are obtained. Here the focus is on the firms in financial distress, and so only these results are reported.

While ideally the estimation period would have covered a whole business cycle, information on exits is only retained in the database for three years.[6] The final dataset, which is used in the

4 The rules and practices governing the resolution of financial distress in 49 countries is discussed in R. La Porta, F. Lopez-De-Silanes, A. Shleifer and R. Vishny (1998), "Law and Finance", *Journal of Political Economy,* Vol. 106, No 6, pp. 1113-1155. They explain how commercial laws come from two broad traditions. One tradition is the common law family, which is English in origin. The other tradition is civil law, which derives from Roman law. Within the civil tradition, the modern commercial laws can have French, German, and Scandinavian origin. The French Commercial Code, which Italy, Spain and France are inspired by, dates back to Napoleon in 1807. The German Commercial code was written in 1897 after Bismarck's unification of Germany. The Scandinavian laws, by contrast, are "similar to each other but "distinct" from others" (see La Porta et al. (1998), p. 1119)).

5 The literature provides suggestions on how to estimate credit scoring models (see for example D. Lando (2004), "Credit Risk Modeling: Theory and Applications", Princeton Series in Finance). Usually information on firms in financial distress and active firms is gathered and a credit scoring model based on this information is estimated. Here the usual framework is extended. As firms can exit for other reasons than financial distress, these other exit types are included in the estimations, and a competing-risks model is estimated. The methodology follows P. D. Allison (1982), "Discrete-time Methods for the Analysis of Event Histories", in S. Leinhardt (ed.), *Sociological Methodology* (San Francisco: Jossey-Bass), pp. 61-98. Allison (1982) shows that a discrete-time competing risks model can be estimated as a multinomial logit model.

6 In early 2005, the database only held information for the period 2000-2002, thus restricting the empirical analysis to cover just this period.

Table C.1 Number of firms

(2000 - 2002)

	Spain		Italy		France		Total	
Firms in financial distress	180	(0.2)	155	(0.2	1,703	(1.6)	2,038	(0.7)
Voluntary liquidations	95	(0.1)	24	(0.0)	1,409	(1.3)	1,528	(0.5)
Mergers	917	(1.2)	439	(0.4)	63	(0.1)	1,419	(0.5)
Inactive (no precision)	50	(0.1)	65	(0.1)	1,095	(1.0)	1,210	(0.4)
Active firms	74,624	(98.4)	97,049	(99.3)	104,263	(96.1)	275,936	(97.8)
Total	75,866	(100.0)	97,732	(100.0)	108,533	(100.0)	282,131	(100.0)

Sources: Bureau van Dijk (Amadeus) and ECB calculations.
Note: Figures in parentheses are shares in the total.

estimations, covers 282,131 firm-year observations covering Italian, French and Spanish firms in the period 2000 to 2002. Table C.1 gives an overview of the number of firms in the three countries split up according to active firms and the exit type. The proportion of firms in financial distress to the overall number of firm-years is 0.2% in Spain and Italy and 1.6% in France. Despite the differences in levels, it is the assessment, that the sample is random and accordingly, that the estimations are consistent and that the effects of the explanatory variables can be meaningfully compared.[7]

The explanatory variables included in the estimations are divided into core variables, proxy variables and controls.[8] The core variables are the variables that are usually used in credit rating studies, such as the earnings ratio and the solvency ratio. The proxy variables include ownership variables and a variable which indicates the legal form of the company. Controls for the macroeconomic environment and for the various sector affiliation categories are also used. The definitions of the explanatory variables, as well as their expected effects, are presented in Box C.1.

THE ESTIMATED DETERMINANTS OF FINANCIAL DISTRESS IN THE COUNTRY MODELS

The individual credit scoring models are estimated. The estimations show that the determinants of financial distress differ between the countries, although there are also some similarities (see Box C.2).

Two determinants of financial distress have similar explanatory power across countries: the earnings ratio and the solvency ratio. As theory predicts, they are significant in all countries and the coefficient is negative, indicating that the higher the ratios, the less likely a firm is to enter financial distress.

The variables, which differ between the countries in terms of whether or not they are significant or what sign they have, are leverage, size, age of the company, legal form and ownership (high concentration).

Leverage is only significant (and has a positive sign) in Spain and France. The variable is not significant for Italy.

7 To benchmark the French, Spanish and Italian data, they are compared to a sample of Danish SMEs, which covers the whole population of Danish public and private limited liability companies. The sample is analysed and discussed extensively in Dyrberg (2004). In this sample of Danish firms, the proportion of firms in financial distress to all other firms is 0.8%, which is higher than the percentage in Italy and Spain and lower than in France. Compared to the dataset used by Dyrberg, the following corrections are made in order to make the Danish figures comparable to the French, Spanish and Italian figures. Only SMEs are considered, and the financial distress measure is modified to be comparable to the financial distress measure used in this special feature. The Danish dataset includes firms in financial distress in the period 1995-2001.

8 A number of potential explanatory variables (not reported) were also considered, but were not found to be significant. These included the interest payment burden, other earnings ratios such as profit for the period over total assets, profit for the period over operating revenue, and cash flow over operating revenue.

Box C.1

THE EXPLANATORY VARIABLES (CORE VARIABLES, PROXY VARIABLES AND CONTROLS)

This Box describes the key independent variables that are considered with the aim of explaining the likelihood of financial distress among the firms examined. The variables are separated into two groups: core and proxy. Controls are also included in the estimations.

Core variables:
1) Earnings ratio: earnings before interest, taxes, depreciation and amortisation (EBITDA), relative to total assets. As higher profits ordinarily imply a lower likelihood of financial distress, the expected sign of this variable is negative in all countries.
2) Solvency ratio: shareholder funds relative to total assets. The solvency ratio provides information on the past ability of a firm to generate satisfactory earnings. Higher financial buffers should lower the likelihood of financial distress, and so the expected sign of this variable is negative in all countries.
3) Leverage: loans over total assets. As a high level of leverage implies that companies may find it difficult to repay their loans, or a higher likelihood of experiencing financial distress, this variable is expected to have a positive coefficient.
The next two hypothesised effects are the effects of firm size and age. It is important to mention that the effects of these variables are correlated (i.e. because older firms tend to be larger than younger firms), and that it can be difficult to disentangle the effects. Here the effect of one variable given the effect of the other variable is discussed.
4) Firm size: the logarithm of total assets. Two hypotheses can be constructed based on the effect of firm size. The first is that an optimal firm size does exist, meaning that there is a trade-off between being relatively small and being relatively large. This would indicate that the effect of firm size on the probability of experiencing financial distress is nearly U-shaped. The reasoning is that small firms have a higher probability of falling into financial distress, because they are not so resistant to the shocks they might encounter, whereas large firms have a high probability of falling into financial distress, as they might have inflexible organisations, encounter problems with monitoring managers and employees, and struggle to provide efficient intra-firm communication. The second hypothesis is that the probability of financial distress decreases along with an increase in firm size. This is in line with the theoretical literature. Various studies have shown that exit rates are a decreasing function of firm size, because larger and older firms are better at adjusting to drastic innovations.[1] Along the lines of the literature, it is expected that larger firms are less likely to face financial distress.
5) The age of the firm: according to theory, firms learn about their efficiency as they operate in the industry.[2] Firms know the average level of market profitability, but they do not know their own potential. After entry, firms start to learn about their own profitability potential, and either expand, contract or exit, depending on where they are in the distribution of profitability. Efficient firms grow and survive, whereas inefficient ones decline and fail. It takes time for entrant firms to acquire sufficient information about their parameters before they are able to

1 See B. Jovanovic and G. MacDonald (1994), "The Life Cycle of a Competitive Industry", *Journal of Political Economy,* Vol. 102, No 2, pp. 197-247 and S. Klepper (1996), "Entry, Exit, Growth and Innovation over the Product Life Cycle", *American Economic Review,* Vol. 86, No 3, pp. 562-83.
2 See B. Jovanovic (1982), "Selection and the Evolution of Industry", *Econometrica,* Vol. 50, No 3, pp. 649-70; and A. Pakes and R. Ericsson (1998), "Empirical Implications of Alternative Models of Firm Dynamics", *Journal of Economic Theory,* Vol. 79, No 1, pp. 1-45.

decide whether or not they want to exit or stay in the market. The theory implies that when firms are young they have not yet learned their own potential and the profitability of exit is low. This phase is then followed by a period in which the probability of exit is high, before a final phase when the probability of exit decreases again. In other words, the effect of age on exits is bell-shaped. As the firms considered in this special feature are firms that have at least ten employees and total assets of at least 2 million euro, the assumption is that they have already learned about their own potential. The hypothesis is therefore that only the last effect is applicable, namely that the older the firms are, the less likely they are to head into financial distress.

Proxy variables:

6) The number of registered subsidiaries is a proxy for diversification. As information is lacking on whether the subsidiaries are wholly owned or not, the effect of the variable is ex ante ambiguous.

7) The legal form is a proxy for the willingness to take on risk. It is set to 1 for private limited liability companies and at 0 for public limited liability companies. As private limited liability companies have less share capital than public limited liability companies, this variable is likely to have a positive sign, reflecting the higher risk of limited liability companies.[3]

8) The number of registered shareholders is a proxy for the environment the firm is operating in. It measures the number of shareholders but not the degree of ownership concentration (see below). However, it is correlated with the concentration of ownership. It is left to the estimations to show whether or not this variable has a significant effect.

9), 10) and 11) Ownership information is included in the estimations as a proxy for the firms' internal environment. The governance of a firm, and thus its financial decisions, is influenced by its ownership structure. Three variables which measure the concentration of ownership are included: ownership (small concentration), ownership (medium concentration) and ownership (high concentration). Ownership (small concentration) is equal to 1 when none of the company's shareholders has an ownership share larger than 24.9%. Ownership (medium concentration) is equal to 1 when none of the company's shareholders has more than 49.9%, but at least one or more shareholders have an ownership percentage above 24.9%; and ownership (high concentration) is equal to 1 when at least one of the shareholders owns over 49.9% of the firm's shares. In all three cases it is equal to 0 when there is no information on the shareholders. Analysis of the potential conflict between owners leads to the result that it is desirable to concentrate ownership among a few individuals.[4] The hypothesis is therefore that ownership (high concentration) is significant and has a negative sign. No hypotheses are set up with regard to ownership (small and medium concentration).

Controls:

Year dummies are included to control for the macroeconomic environment. The reference year is 2000.

Sector affiliation dummies are included to control for the various sectors that the firms are operating in.

3 See J. E. Stiglitz and A. Weiss (1981), "Credit Rationing in Markets with Imperfect Information", *American Economic Review,* Vol. 71, No 3, pp. 393-421.

4 See M. Bennedsen and D. Wolfenzon (2000), "The Balance of Power in Closely Held Corporations", *Journal of Financial Economics,* Vol. 58, No 1-2, pp. 113-39.

The estimations show that size and age do not affect financial distress in the Spanish case, but that they do affect financial distress in the Italian and French case. The size and the age variables are correlated, so that it can be difficult to disentangle the effects. This is what is seen from the estimations. In France and Italy both variables are significant, but with changing signs, so that if age is significant and has a positive effect in one country, then size is significant and has a negative effect in the same country, or vice versa. When the least significant variable (either age or size) is left out of the estimations for France and Italy, respectively, the remaining variable is significant and has the expected negative sign.[9]

The legal form dummy is only significant in the Italian case, where it has the expected positive sign. The level of share capital between public and private limited liability companies differs between the countries. It is not surprising that the effect of the private limited liability variable is only significant in the case of the Italian firms, where the difference in share capital between the private and public limited liability companies is the largest.

The estimations show that there is no effect of ownership (high concentration) for the Italian and Spanish firms. The parameter estimate is however significant for the French firms and has the expected negative sign.

The following variables were examined to establish whether they affect financial distress or not: the number of registered subsidiaries; the number of registered shareholders; the concentration of ownership (medium concentration); and the concentration of ownership (small concentration). No effects were expected. The estimations show that none of the variables was significant in any of the countries.

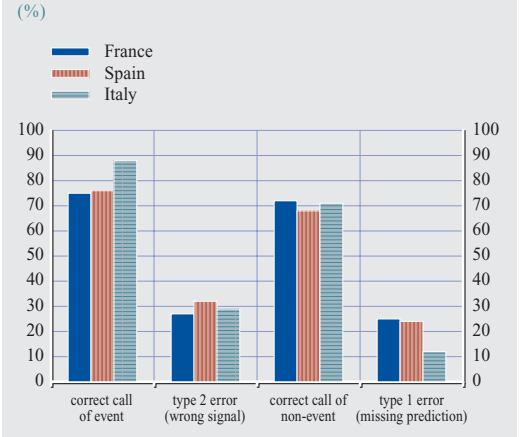
DETECTION OF FINANCIAL DISTRESS

A measure of how well the models fit the data is the proportion of correct predictions in the total. There is a trade-off between incorrectly classifying a firm that does not exit because of financial distress as a financially distressed firm, and failing to classify correctly a financially distressed firm.

In order to separate the predictions which are probabilities, it is necessary to choose a cut-off value for the probability. The naïve predictor uses a cut-off value of 0.5, which means that firms that have a predicted probability above 0.5 are classified as financially distressed, whereas firms that have a predicted probability below 0.5 are classified as active. Such a cut-off level has a rationale if 50% of the firms in the samples eventually became financially distressed. However, the samples analysed here were skewed, with only a fraction of firms in financial distress compared to all other firms, calling for the 0.5 cut-off to be modified. Instead, the cut-off level is set as the proportion of financially distressed firms to all other firms. With these cut-off levels, the models correctly classify between 75 and 88% of the financially distressed firms, and between 68 and 72% of the active firms (see Chart C.1).

9 If the age variable is left out of the French estimation, the size variable is still significant and has a negative sign in the estimated credit scoring model. If size is left out of the Italian estimation, age is still significant and has a negative sign in the estimated credit scoring model.

Chart C.1 Discriminatory power



Sources: Bureau van Dijk (Amadeus) and ECB calculations.

Had a lower cut-off level been chosen, then the models would have predicted that more firms would become financially distressed, but this would be at the cost of an increased number of so-called type 2 errors (i.e. sending the wrong signal). If the cut-off level is increased, then the frequency of type 2 errors will diminish, but at the cost of a decreased number of firms being predicted as being in financial distress (and with an increase in type 1 errors). Ultimately, the cut-off level depends on the agents' objective function, also called the loss function. It should reflect an assessment of the cost of making type 1 and type 2 errors.

THE COUNTRY MODELS COMPARED TO A COMMON CREDIT SCORING MODEL

The country models are compared to a common credit scoring model in order to assess the differences in the determinants of financial distress and in the predictive ability of the two set-ups (see Box C.2). The common credit scoring model is estimated on a pooled data set, which includes the data used for all three country models.

The comparison of the core variables in the common model with the individual country models shows that the only country with results similar to the results in the common model (in terms of what predictors of financial distress are significant, their sign and their magnitude) is France. Except for leverage, which is not significant in the pooled model, but is significant in the French country model, all core variables are significant in both the French country model and the pooled model; they also have the same sign and are of similar size in the two set-ups. When the pooled model is compared to the Italian and the Spanish country models, only the earnings ratio and the solvency ratio are significant and have the same sign in both model set-ups. However, the parameter estimates are of quite different magnitude.

Box C.2

ESTIMATION RESULTS

Table C.2.1 Core variables

	estimated sign			
core variables	Italy	France	Spain	pooled model
earnings ratio	-	-	-	-
solvency ratio	-	-	-	-
leverage	insignificant	+	+	insignificant
firm size	+	-	insignificant	-
age	-	+	insignificant	+

Table C.2.2 Proxy variables

	estimated sign			
proxy variables	Italy	France	Spain	pooled model
number of subsidaries	insignificant	insignificant	insignificant	-
legal form	+	insignificant	insignificant	-
number of shareholders	insignificant	insignificant	insignificant	-
ownership (small concentration)	insignificant	insignificant	insignificant	+
ownership (medium concentration)	insignificant	insignificant	insignificant	+
ownership (high cencentration)	insignificant	-	insignificant	+

Comparison of the proxy variables in the common model with the individual country models shows that there are no similarities between the country models and the common model. All proxy variables are significant in the pooled model. Only one proxy variable was significant in the French and in the Italian case (but with different signs than in the pooled model), and none of the proxy variables was significant in the Spanish case.

The estimation of the pooled model delivers a sign on four variables which were insignificant in the individual credit scoring models, and for which no hypotheses were set up. These are the number of subsidiaries (-), the number of shareholders (-), ownership (small concentration) (+) and ownership (medium concentration) (+). The sign of two of the other significant proxy variables in the pooled model seems puzzling. The proxy variable ownership (high concentration) is significant and has a positive sign in the pooled model. Furthermore, the legal status variable is significant and has a negative sign in the pooled model.

The overall predictive ability of the common model is similar to that of the individual country models, but it hides important differences between the two model set-ups.[10] The common model correctly predicts 74% of the financially distressed firms, and 72% of the active firms. Further investigation shows that the common model does better for France than the French credit scoring model, but worse for Spain and Italy than the Spanish and Italian credit scoring models.

CONCLUDING REMARKS

This study investigated the determinants of corporate failure in Italian, Spanish and French SMEs. The empirical analysis is based on a sample, which covers the period 2000-2002. The estimations show that some common factors, such as the earnings ratio and the solvency ratio, have similar predictive power across countries, but also that there are important differences in the determinants of financial distress across the three countries. The findings have implications for at least two policy areas, namely financial stability analysis and Basel II.

10 The conclusions from the comparisons depend on the chosen cut-off levels. In all models the proportion of firms in financial distress to all other firms was chosen as the cut-off level.

D HAS THE EUROPEAN COLLATERALISED DEBT OBLIGATIONS MARKET MATURED?

A market for collateralised debt obligations (CDOs) has evolved rapidly in Europe in recent years. Synthetically created CDOs based on credit default swaps have become a popular vehicle for transferring corporate-related credit risk from the banking sector to other parts of the financial system. As with other new markets, CDOs contribute to financial efficiency, but also present new risks that central banks need to understand. From a financial stability viewpoint, concerns have been expressed about mispricing and inadequacies in risk management, even by the most sophisticated market players, as well as excessive reliance on rating agencies. Furthermore, public authorities face challenges in tracking credit risk around the financial system. Innovation and improvements in market functioning have helped to mitigate some of these concerns. In particular, the evolution of credit indices has fostered standardisation and secondary market activity. However, challenges for financial stability remain, requiring an ongoing monitoring of market developments by central banks.

INTRODUCTION

A CDO is a debt security issued by a special purpose vehicle (SPV) and backed by a corporate loan or bond portfolio ("cash CDO"). A so-called synthetic CDO has similar features, but the underlying securities are credit default swaps (CDS) that have been repackaged into a reference portfolio.[1] Unlike asset-backed securities (ABS), CDOs are not backed by a large, granular and homogeneous pool of assets, but by a heterogeneous asset pool with relatively few underlying obligors.

Typically several classes (or "tranches") of securities with different degrees of seniority in the event of bankruptcy are issued to investors, permitting the re-engineering of the risk/return profile of the underlying collateral pool into multiple risk classes. The first-loss tranche – called "equity" – absorbs the risk of payment defaults or delays. The next, more senior, tranche – called "mezzanine" – will incur losses only if the equity tranche is exhausted. The senior tranche is protected in the same fashion by both the mezzanine and equity tranches. Through this credit-enhancing technique, the senior tranche can achieve a triple-A rating – as is indeed the case with 80% of the structured finance market in Europe.

CDOs can also help to mitigate asymmetric information problems that are present in single-name credit risk transfer markets, thus helping to overcome market imperfections.[2] The originator of a corporate debt instrument may have private information about the quality of the debtor or a greater ability to value the debtor than an investor. As investors are aware of this, they will either require a premium to purchase a single-name exposure, or the market may not even exist. The diversification of credit risk in a portfolio makes risk-return profiles less sensitive to the performance of individual names.

By separating the origination and funding of credit from the allocation of the credit risk, CDOs facilitate a broader dispersion of risk which can, depending on where exposures become concentrated, enhance financial stability. Wider access to credit risk exposure enables banks to reduce their vulnerability to idiosyncratic or industry-specific credit risk shocks, for instance. Furthermore, the supply of credit can be less dependent on conditions

1 Synthetic CDO tranches can be either funded or unfunded. If a tranche is funded, the CDO investor pays the notional amount of the tranche when the deal is initiated, and any defaults on the underlying reference portfolio will lead to a write-down of the principal. In the case of an unfunded tranche, payments are not made upfront. The investor receives a spread and pays when defaults in the underlying asset portfolio affect the investor's tranche.

2 See the Committee on the Global Financial System (CGFS) Report (2004), "Role of Ratings in Structured Finance", BIS, for a description of the economics of structured finance. However, it should be noted that asymmetric information is still of concern in actively managed CDO transactions where the arranger or CDO manager has the right to substitute underlying credits during the life of the CDO.

affecting banks' ability or willingness to take on credit risk, possibly making bank-driven credit crunches less likely as the market grows.

As with other innovative financial markets, CDOs can entail new risks that central banks need to understand. To the extent that central banks may accept these instruments as collateral in their credit operations, they may even be directly exposed to them. From a financial stability viewpoint, concerns have been expressed by many market observers concerning mispricing, inadequacies in risk management, excessive reliance on rating agencies, and regarding the challenges CDOs create for public authorities in tracking credit risk around the financial system owing to the opacity of the market.[3] Nevertheless, innovation and improvements in the functioning of CDO markets described in this special feature have served to mitigate some of these concerns.

THE MARKET FOR CDOs IN EUROPE

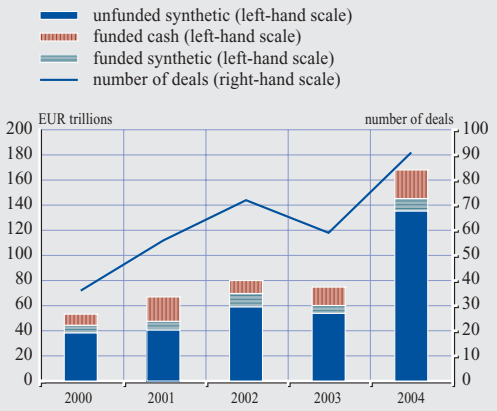
A market for CDOs has evolved rapidly in Europe. Synthetically created CDOs based on CDS have become a particularly popular vehicle for transferring corporate-related credit risk – bundled into portfolios – from the banking sector to other parts of the financial system including the insurance sector, as well as pension and investment funds.

The European CDO market is essentially synthetic, as the corporate bond market is still in its infancy, and obstacles remain to the cross-border transfer of bank loans (see Box D.1). Synthetically created portfolios based on credit risk derivatives are not bound by the availability of cash-settled corporate debt instruments, and can remain on the balance sheet of risk shedders. Corporate bonds and loans also lack liquidity, making it costly for credit investors to assemble a portfolio matching their diversification and risk-return targets. A synthetic portfolio allows investors to economise significantly on transaction costs, since liquidity in the CDS market tends to be much deeper than in those for underlying cash instruments.

Measuring the size of the synthetic CDO market in Europe is fraught with challenges. A large part of the market consists of private, highly customised transactions for which information is limited in the public domain. Estimates based on publicly placed deals are therefore likely to significantly underestimate CDO issuance volumes. According to Merrill Lynch, public CDO issuance amounted to almost EUR 180 billion in 2004 (see Chart D.1).[4] Participants estimate that private issuance could be of a similar magnitude.[5]

Chart D.1 Total European CDO issuance

(2000 - 2004)



Source: Merrill Lynch.

3 Both the Joint Forum Report (2004), "Credit Risk Transfer", and the CGFS Report (2004), op. cit., were inter alia motivated by these concerns.

4 See Merrill Lynch (2005), "Global Cash Flow CDOs and Their Assets", February.

5 This would be consistent with the findings of Fitch Ratings (2004), "Global Credit Derivatives Survey", September. This survey found that total gross protection sold (publicly and privately) via cash and synthetic CDOs amounted to roughly €300 billion in Europe in mid-2004.

Box D.1

EVOLUTION OF THE EUROPEAN CDO MARKET

On the basis of a number of special reports issued by rating agencies and interviews conducted in the context of the CGFS Working Group on the role of ratings in structured finance with rating agencies, arrangers of CDO transactions and investors in the course of 2004, this box describes the main developments in the rapidly-evolving CDO market.

The European CDO market took off with the advent of credit risk derivatives in the late 1990s. Driven by regulatory capital arbitrage of loan-originating banks, synthetically created collateralised loan obligations (CLO) dominated early deals. However, after 2000 the goal of synthetic transactions gradually moved away from balance sheet management to arbitrage CDOs, driven by a desire to exploit arbitrage opportunities between higher yielding assets and lower interest-bearing liabilities.

The first generation of synthetic CDOs was subject to heavy rating downgrades in 2001 and 2002 as the corporate sector was confronted with financial strain. The downgrading was typically attributed to adverse selection in the initial portfolio selection by the sponsoring institution. Responding to the underperformance of the early deals, a two tier market subsequently evolved:

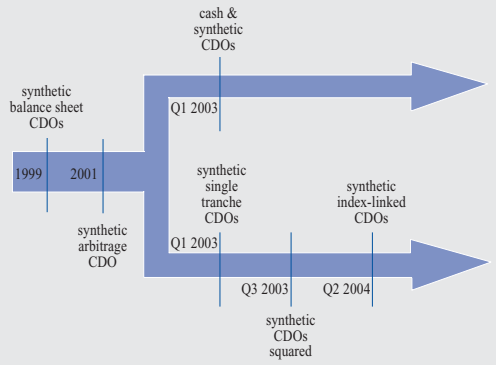
A ***public market***, increasingly standardised and generally backed by large granular portfolios, resembling traditional ABS portfolios. The revival of CLOs backed by SME loans was indicative of this market trend. An important feature of this market segment is that it continues to be rated, and investors tend to be less sophisticated. Senior note investors, which represent the bulk of investors, in particular tend to rely on rating agencies for risk assessment and pricing, while only investors further down the capital structure seem to perform their own due diligence.

A ***highly customised, bilateral market***, in which portfolios continue to be highly concentrated and for which correlation modelling therefore remains essential. This market segment for correlation-intensive CDOs has gone private in that issues are directly placed with investors. This poses challenges for tracking the size of this market segment and for monitoring market developments. According to rating agencies and the large investment banks that arrange CDOs, investors in this market tend to be more sophisticated, and rating agencies play a less crucial role than previously assumed.[1] Regarding the modelling of correlations, in particular, rating agencies have not been standard-setters. Dealers of correlation-intensive products claim to be ahead of rating agencies, which admit to having problems in keeping up with cutting-edge correlation modelling techniques. Overall, it seems that ratings are increasingly used as a benchmark for comparison, but not substituting investors' own risk analysis.

One of the most important recent product innovations in the latter market segment has been the single-tranche CDOs, which, according to rating agencies became the dominant CDO product in 2004. In a single-tranche CDO, the arranger only sells one tranche to one investor. The size

1 See the findings of CGFS (2004), op. cit., based on interviews with rating agencies, arrangers and investors.

Figure D.1.1 Evolution of the European CDO market



Source: ECB.

of this tranche is designed to match exactly the risk appetite and credit expertise of an individual investor. Single-tranche CDOs have allowed more sophisticated investors to alleviate the conflicts of interests that were present in earlier deals, by giving them greater control over the characteristics of the transaction, enabling them to select some or all of the underlying credit. Moreover, they are easier to restructure in the wake of a credit event. Only one investor's approval is needed to inject additional equity into a deal and thereby to maintain its rating.

The advantage of single-tranche CDOs for arrangers/dealers is that investors must not be found for all tranches across the entire capital structure in order to execute a transaction. However, single-tranche CDOs create new hedging requirements: whereas in a traditional arbitrage CDO the dealer's position is fully hedged (i.e. the same amount of credit is sourced in the market as is transferred to CDO investors), in a single-tranche CDO a dealer is unable to hedge the position perfectly by engaging in an offsetting transaction. Instead, the dealer needs to sell protection on each of the underlying credits via CDS according to the "delta" – a measurement of the amount of protection that needs to be sold on each name to hedge the mark-to-market on the overall single-tranche position caused by spread movements in that particular name – of each credit. These amounts change as the level of credit spreads changes, which means that single-tranche CDOs require dynamic hedging.

Such hedging activities have created strong linkages between the single-name CDS and the synthetic CDO market. In fact, the market for correlation products has evolved to encompass two dimensions: portfolio credit risk transfers executed via single-tranche CDOs (and related products) from the arranger to the investor, and the CDS executed by the arranger in the market to hedge outstanding risks stemming from those transactions. Since the former instruments are highly leveraged, hedging needs are a multiple of the notional outstanding amounts of single-tranche CDOs.

FINANCIAL STABILITY CONCERNS ARISING FROM THE PRIVATE CDO SEGMENT

After investors were faced with downgrades and losses in 2001 and 2002, arrangers together with rating agencies developed in the public CDO segment a strand of CDOs backed by highly diversified portfolios that more closely resemble traditional ABS, and that can rely on established rating methodologies. Moreover, structural enhancements and tighter covenants for actively managed CDOs have helped to mitigate some of the moral hazard and adverse selection problems present in the earlier deals. However, while pricing and model risks have declined in the public CDO market, they remain present in the private CDO segment, which continues to be dominated by highly correlation-intensive products.[6]

6 Both the Joint Forum Report (2004), op. cit., and the CGFS Report (2004) stress model and liquidity risk inherent in single-tranche CDOs and related hedging activities.

The degree of portfolio diversification is a crucial determinant for the shape of the loss distribution of a heterogeneous portfolio of underlying credit exposures. While the probability distribution of an uncorrelated portfolio's potential losses is generally centred on the expected loss, a highly correlated portfolio may exhibit thick tails, so that the probability of severe losses (or significant gains) can be very high. As a consequence, the higher a portfolio's correlation, the higher the risk of the senior tranche becomes: either no asset in the portfolio defaults and all tranches, including the equity tranche, remain free of losses, or all assets default and all tranches suffer a loss. Accordingly, accurate estimation of default correlations is essential for precision in the pricing of different tranches.

However, a key problem is the scarcity of empirical data on default correlation. As a result, when investors price these transactions and when the arrangers/dealers that have put them together hedge their outstanding positions, they are exposed to the risk that their correlation assumptions could prove to be imprecise ("model risk").

In addition, when dynamic hedging techniques are required, as in the case of single-tranche CDOs, arrangers/dealers are exposed to liquidity risk (see Box D.1). Successful hedging of the outstanding risk on a single tranche sold to investors requires a liquid CDS market for the underlying reference entities. To the extent that the latter may not have sufficient liquidity for dealers to adjust hedges as desired, without incurring high trading costs, hedges may remain incomplete. Whether the European CDS and corporate bond markets provide as yet enough liquidity to absorb the substantial increase in hedging transactions created by the explosive growth of the single-tranche CDO market remains to be seen. In a deteriorating credit environment when dealers would have to rebalance their hedges on a large scale due to the highly leveraged nature of single-tranche CDOs, liquidity in the CDS market could start to dry up. A substantive widening of spreads in the CDS market may feed back to underlying cash markets such as the corporate bond and syndicated loan market creating adverse market dynamics. Hence, while under current market conditions the extended linkages between CDS and underlying cash markets created by synthetic CDOs has reinforced the tightening of credit spreads in the corporate bond market, it may amplify credit spread widening in times of market stress and create a channel for contagion.

IMPROVED MARKET FUNCTIONING THROUGH THE EVOLUTION OF CREDIT INDICES?

A recent market innovation that has fostered the trading of credit risk correlations is that of CDS indices. CDS indices are tradable portfolios consisting of the most liquid single-name CDS. They allow market participants to express relative views on the credit markets by region or sector in a cost-efficient manner, and can be an important tool for the hedging of credit exposures within loan and bond portfolios.

The roll-out of a single set of global CDS indices – iTraxx – in mid-2004 was a catalyst for the trading of single-tranche CDOs in both Europe and the US (See Box D.2). Because of the liquidity the indices provide, CDS index tranches – synthetic CDO tranches based on the iTraxx index – have started to develop in Europe. Compared to the highly customised single-tranche CDOs, such products are standardised. This has facilitated the development of a liquid secondary market for CDS index tranches. It has also made pricing more transparent, since CDS indices provide a market estimation of default correlation. As a consequence, investor participation has already started to broaden. Hedge funds that had previously concentrated on single CDS and avoided portfolio credit derivatives due to high pricing and liquidity risk are now entering the market. Insurers, pension funds and other institutional investors have also started to trade iTraxx tranches and other second generation derivatives.

Box D.2

TRADABLE CDS INDICES AND THE FUTURE EVOLUTION OF CREDIT AS AN ASSET CLASS

On 21 June 2004 the leading market makers in credit risk derivatives agreed to merge two competing indices, Dow Jones' TRAC-X and iBoxx, into one index family – iTraxx in Europe and Asia and CDX in North America.[1] A CDS index contract is an insurance contract covering default risk on the pool of names in the index. Liquidity is enhanced by including only the most liquid single-name CDS in the indices and by market-making activities. In Europe, iTraxx brings together 27 market makers. It is composed of several benchmark indices for investment-grade and non-investment-grade credits, and numerous sector indices that are transparent, rules-based and administered by a jointly owned private company (the International Index Company).

The formation of a single index family has allowed market participants to focus all trading on one index for each region, each sector and for various maturities. This has considerably boosted liquidity. Bid-offer spreads in the market have dropped from 5/10 basis points across the preceding indices to half a basis point across the main five-year iTraxx Europe index. Leading market makers in Europe foresee a further tightening of spreads in line with patterns seen in the US credit default swap index ("CDX index"). Moreover, for each market it represents, the CDX index has become the single most liquid instrument in that credit market.

iTraxx has promoted transparency for market participants, since bid-offer spreads are quoted on a daily basis and made available online to non-bank investors as well. This provides non-bank investors with a reference market-based price that was previously unavailable. Indices also facilitate the exploitation of arbitrage possibilities between the index and its individual components, thereby enhancing the price discovery process. Moreover, they can also provide market-based model inputs, including various implied correlations. In this way, they further facilitate the movement from model-based to market-based pricing. In parallel to International Swaps and Derivatives Association (ISDA) initiatives for promoting industry credit derivatives standards, the iTraxx consortium of market makers has also been active in promoting the standardisation of CDS indices and second-generation index products. It has recently also facilitated the adoption of market standards for the selection of reference obligations, with a view to ensuring that illiquid names are replaced by more liquid ones. These market-led inititives are reducing legal and operational risks, thereby enhancing liquidity.

Until recently, a two-way market in high-yield CDS had been developing only slowly, and the low level of liquidity of these credits impeded their inclusion in single-tranche CDO portfolios. The establishment of one widely traded high-yield index, iTraxx crossover, has expanded the universe of frequently traded corporate names in the CDS market to the high-yield sector. This has boosted liquidity in the high-yield single-name CDS market in Europe.

There are indications that the introduction of credit indices is fostering more liquid and transparent markets for credit risk generally. Credit indices seem to be increasingly used to price new corporate bond issues and may become the crucial benchmark for borrowers, thereby possibly also impacting the functioning of underlying cash credit markets.

1 See ABN AMRO, Deutsche Bank, JP Morgan and iTraxx indices (2005), "The 2005 Guide to Tradable Credit Derivatives Indices".

Enhanced secondary market liquidity may foster credit risk transfer outside the banking sector.[7] While insurers and other institutional investors often only acquired senior tranches, risk-shedding banks retained the riskiest first-loss tranche. In addition, because the high-yield credit derivatives market has been slow to develop, investment-grade names have remained predominant in underlying asset portfolios. Increased position-taking by institutional investors in equity CDS index tranches may, however, build up momentum. There are also indications that high-yield credit indices have begun to boost liquidity in the high-yield single-name market. This may facilitate the inclusion of high-yield reference entities in single-tranche CDOs, thereby further enhancing the scope for larger cross-sectoral credit risk transfer.

However, the trend towards more standardisation of single-tranche CDOs has gone hand in hand with an opposite trend: driven by the strength of investors' appetite for yield-enhancing strategies in the current low-yield environment, the innovation cycle has substantially shortened. Arrangers and dealers are expanding the range of asset classes to ever more exotic assets (such as private equity, project finance, distressed debt, etc.). They continue to develop innovative, complex products for which correlation modelling techniques are still in their infancy. "CDO squared", or "CDOs of CDOs", are only one of the more recent market innovations.[8] Therefore, model risk and risks of mispricing remain high and it cannot be ruled out that investors or even arrangers may lack the analytical capacity to understand fully the risks embodied by these new complex products. Moreover, a number of market participants have expressed concern that there is not enough price differentiation in the current tight spread environment, and that neither CDO managers nor investors carry out enough credit work when putting new deals together.

CONCLUDING REMARKS

The smooth functioning of the CDO market is important for an efficient allocation of risks within and outside the banking sector. In Europe it is clearly too early to say that the CDO market has matured. Market forces seem to be pushing in two opposite directions. On the one hand, the evolution of CDS index tranches has fostered standardisation of CDOs and facilitated active trading, thereby enhancing pricing and hedging capabilities and increasing the scope for cross-sectoral credit risk transfer. On the other hand, there is a tendency to introduce ever more complex products, driven by a continuous hunt for yield. It is difficult to assess to what extent investors and even arrangers have the analytical capacities to price and manage the risk of these transactions adequately. Given the pace of innovation and the ever wider participation of financial intermediaries in structured product markets, it is becoming increasingly important to map the nature and gauge the stability of such markets. Moreover, since the rapid growth of the CDO market and resulting hedging needs have increased the linkages between credit risk transfer instruments and other financial markets, central banks need to monitor market dynamics and assess their functioning in as yet untested stress conditions. Since effective monitoring is still hindered by the private nature of a large part of the market, efforts to improve information on credit risk transfer activities need to be strengthened.

7 See ECB (2004), "Credit Risk Transfer by EU Banks: Activities, Risks and Risk Management", and Standard & Poor's (2003), "Demystifying Banks' Use of Credit Derivatives".

8 In the European context, CDO squared are a repackaging of single-tranche CDOs that have been specifically created for the purpose of the transaction. The performance of CDO squared is ultimately derived from the performance of the combined pools of CDS underlying the single-tranche CDOs. CDO squared effectively allow investors to take "the cliff risk", i.e. no losses up to a certain point (typically in about 90% of the cases), after which the loss deterioration is very fast. To compensate investors for this "cliff effect", CDO squared offer investors higher yield.

STATISTICAL ANNEX

I EXTERNAL ENVIRONMENT

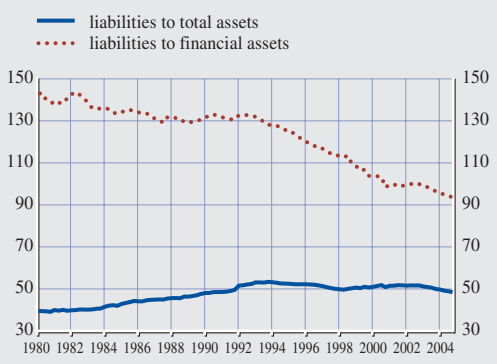
Chart S1 US non-financial corporate and business debt-to-GDP ratios

(Q1 1960 - Q4 2004, %)

Sources: US Federal Reserve Board and ECB calculations.
Note: Non-financial business comprises three sectors: non-farm non-financial corporate business, non-farm non-corporate business, and farm business.

Chart S2 US corporate liabilities-to-asset ratio

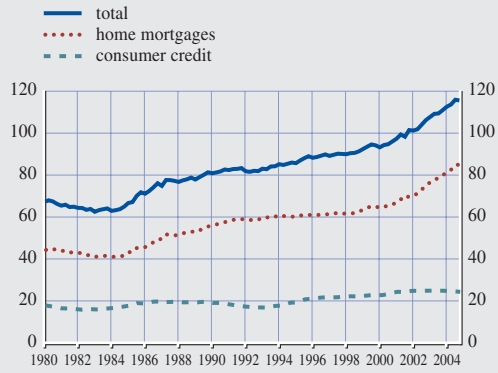
(Q1 1980 - Q4 2004, %)



Source: US Federal Reserve Board.

Chart S3 US household debt-to-disposable income ratio

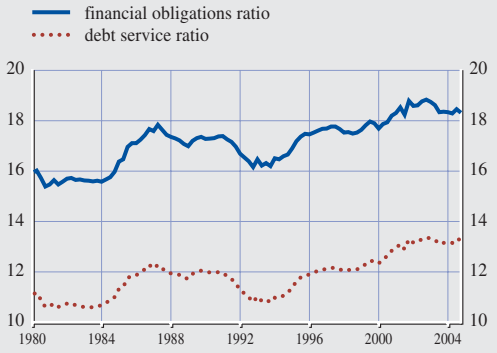
(Q1 1980 - Q4 2004, % of personal disposable income)



Source: US Federal Reserve Board.

Chart S4 US household debt burden

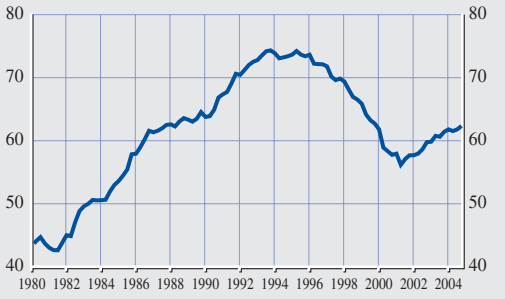
(Q1 1980 - Q4 2004, % of disposable income)



Source: US Federal Reserve Board.

Chart S5 US government debt-to-GDP ratio

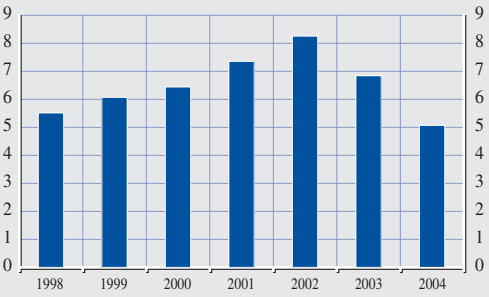
(Q1 1980 - Q4 2004, %)



Source: US Federal Reserve Board.

Chart S6 Japanese banks' non-performing loans

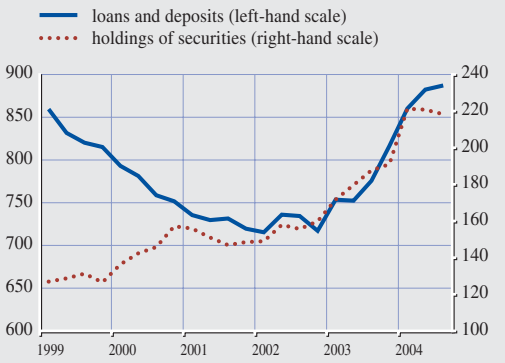
(1998-2004, % of total loans)



Source: Japan Financial Services Agency.
Note: All data end-September.

Chart S7 International positions of all BIS reporting banks vis-à-vis emerging markets

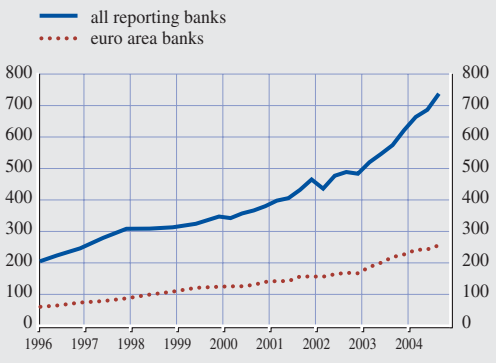
(Q1 1999 - Q3 2004, USD billions)



Source: Bank for International Settlements (BIS).

Chart S8 Consolidated claims on non-banks in offshore financial centres

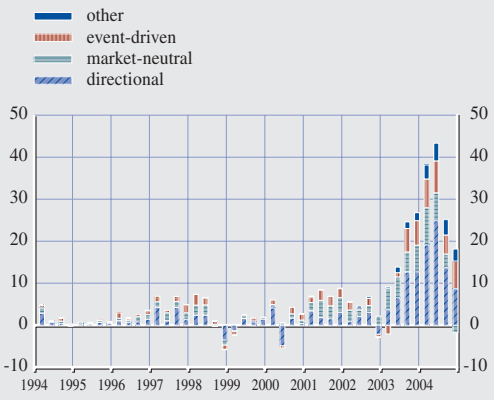
(Q1 1996 - Q3 2004, USD billions)



Source: Bank for International Settlements (BIS).

Chart S9 Hedge fund inflows

(Q1 1994 - Q4 2004, 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

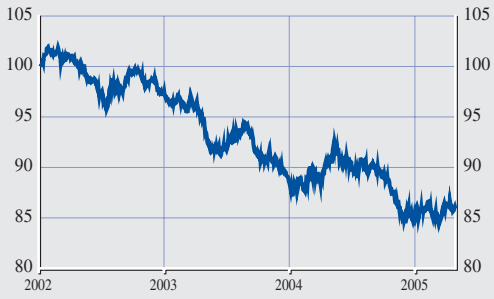
	Current account balance (% of GDP)		External debt (% of GDP)		Short-term external debt (% of reserves)		Foreign reserves (in months of imports)	
	2001	2004	2001	2004	2001	2004	2001	2004
Latin America								
Argentina	-1.5	2.7	56	116	148	92	4.3	6.0
Brazil	-4.6	1.9	45	37	84	41	4.5	6.1
Chile	-1.6	1.5	57	49	27	41	6.8	4.9
Colombia	-1.6	-1.6	48	41	33	32	6.3	6.8
Mexico	-2.9	-1.3	25	25	80	55	2.6	3.2
Venezuela	1.6	14.7	31	36	84	36	4.0	8.3
Asia								
China	1.5	4.2	14	14	17	16	8.6	11.7
India	0.7	0.7	24	19	22	10	8.0	11.3
Indonesia	4.2	1.4	81	50	68	43	5.5	5.6
Malaysia	8.3	12.7	52	55	21	26	3.9	6.1
South Korea	1.7	4.1	27	26	41	30	6.9	8.7
Thailand	5.4	4.4	58	31	35	25	5.2	5.3
Emerging Europe								
Russia	9.8	7.9	42	35	65	42	5.7	11.6
Turkey	2.3	-5.0	79	58	105	120	4.2	3.8

Source: Institute of International Finance.

2 INTERNATIONAL FINANCIAL MARKETS

Chart S10 Nominal broad USD effective exchange rate index

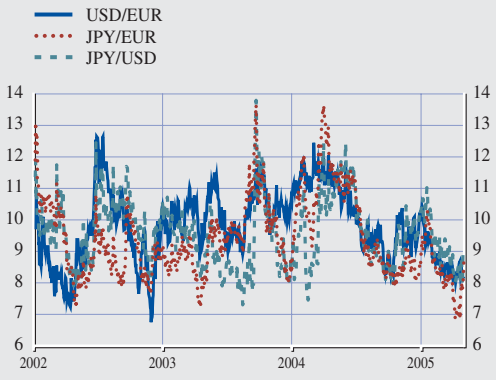
(Jan. 2002 - Apr. 2005, index: Jan. 2002 = 100)



Source: US Federal Reserve Board.

Chart S11 One-month implied volatility for USD/EUR, JPY/EUR and JPY/USD

(Jan. 2002 - May 2005, %)



Source: Reuters.

Chart S12 US risk aversion index

(Jan. 1990 - Mar. 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 S13 Stock prices in the US

(Jan. 2002 - May 2005, S&P 500, index: Jan. 2003 = 100)

Source: Reuters.

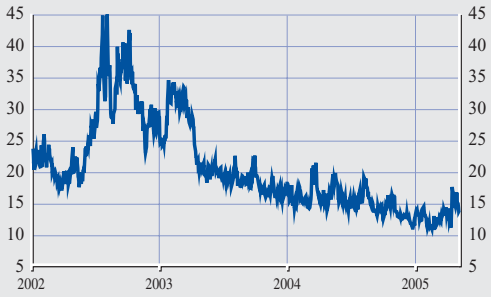
Chart S14 Price-earnings (P/E) ratio for the US stock market

(Jan. 1983 - Apr. 2005, ten-year trailing earnings)

Sources: Thomson Financial Datastream and ECB calculations.
Note: The price-earnings ratio is based on prevailing stock prices relative to an average of the previous ten years of earnings.

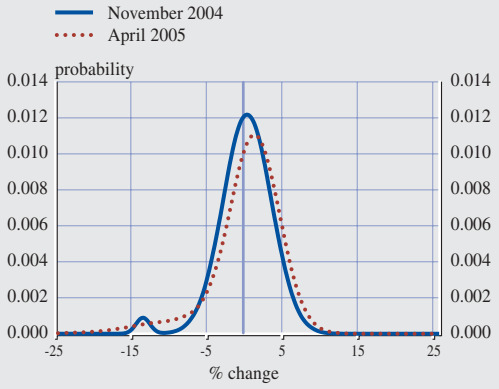
Chart S15 VIX implied volatility for the S&P 500 index

(Jan. 2002 - May 2005, S&P 500)



Source: Thomson Financial Datastream.
Note: Data calculated by the Chicago Board Options Exchange (CBOE).

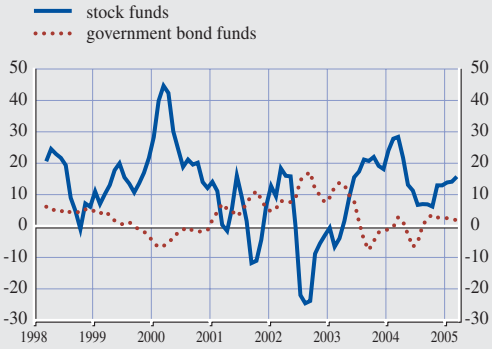
Chart S16 Option implied probability distribution function for the S&P 500 index



Sources: Bloomberg and ECB calculations.

Chart S17 US mutual fund flows

(Mar. 1998 - Mar. 2005, USD billions, three-month moving average)



Source: Investment Company Institute.

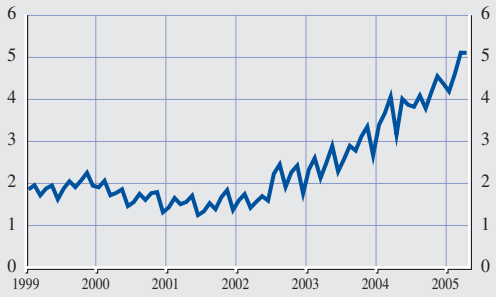
Chart S18 Debit balances in New York Stock Exchange margin accounts

(Jan. 1992 - Mar. 2005, USD billions)

Source: New York Stock Exchange (NYSE).

Chart S19 Open interest in options contracts on the S&P 500 index

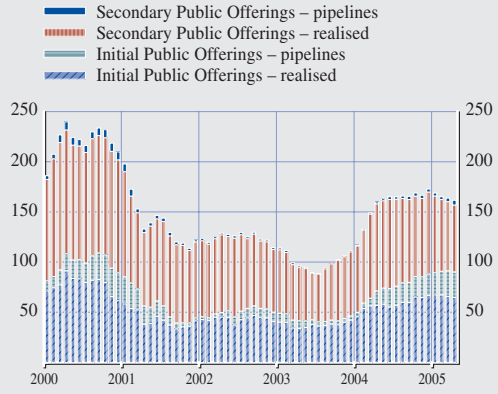
(Jan. 1999 - Apr. 2005, millions of contracts)



Source: Chicago Board Options Exchange (CBOE).

Chart S20 Gross equity issuance in the US

(Jan. 2000 - Apr. 2005, USD billions, 12-month moving sums)



Source: Thomson Financial Datastream.

Chart S21 Spreads on US high-yield corporate bonds

(Jan. 1999 - May 2005, basis points)

Source: JP Morgan Chase & Co.
Note: Spread between yield to maturity of US domestic high-yield index (BB+ rating or below, average maturity of 7.7 years) and US ten-year government bond yield.

Chart S22 Emerging market bond spreads

(Jan. 1994 - Apr. 2005, basis points)

Source: JP Morgan Chase & Co.
Note: The series shown is the Emerging Market Bond Index Plus (EMBI+) "performing" index.

Table S2 Total international bond issuance (private and public) in selected emerging markets

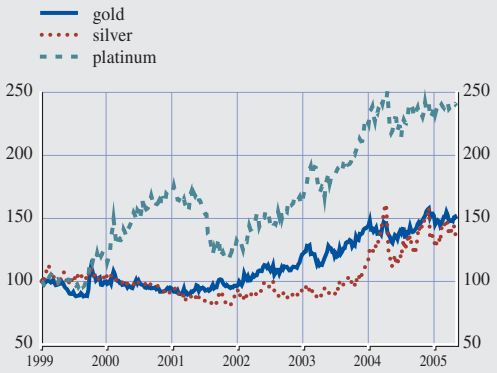
(USD millions)

	2001	2002	2003	2004 Q1	2004 Q2	2004 Q3	2004 Q4	2004 Total	2005 Jan.-Apr.
Total major EMEs	**67,203**	**64,852**	**98,306**	33,309	24,068	27,591	28,315	**109,876**	32,074
Latin America	**29,154**	**19,143**	**32,635**	12,039	7,536	9,127	8,009	**36,712**	10,781
of which:									
Argentina	3,328	-	-	915	-	-	-	-	150
Brazil	7,417	5,736	11,803	3,414	1,207	3,226	1,500	9,346	3,492
Chile	2,150	1,399	1,000	750	-	57	500	1,307	-
Colombia	4,004	1,000	1,265	500	-	500	544	1,544	447
Mexico	7,552	6,278	11,226	4,574	4,648	4,808	1,470	15,501	3,363
Venezuela	1,729	1,049	4,478	1,200	1,180	-	2,260	4,640	2,929
Non-Japan Asia	**31,675**	**35,480**	**50,117**	15,119	11,715	14,165	13,832	**54,831**	13,103
of which:									
China	2,552	860	3,029	313	39	1,600	4,437	6,388	500
Hong Kong	9,267	1,645	12,631	1,910	1,452	1,799	1,011	6,171	2,627
India	99	153	450	888	975	750	1,775	4,388	1,138
Malaysia	6,542	12,038	11,368	4,660	4,147	3,650	3,846	16,303	3,939
Singapore	1,766	5,965	1,442	325	650	2,370	765	4,110	1,053
South Korea	7,400	812	3,885	1,864	1,402	1,953	1,841	7,061	914
Thailand	-	48	300	-	1,000	400	-	1,400	150
Emerging Europe	**6,374**	**10,230**	**15,555**	6,151	4,817	4,298	6,474	**18,333**	8,190
of which:									
Bulgaria	223	1,248	62	-	10	-	258	268	260
Croatia	718	647	541	373	725	-	-	1,098	-
Romania	794	1,062	814	-	-	-	-	-	-
Russia	1,353	3,713	8,285	1,760	2,300	3,300	3,130	10,490	4,026
Turkey	2,159	3,560	5,454	2,768	1,075	898	1,736	6,477	3,794
Ukraine	1,127	-	399	1,250	708	100	1,350	-	109

Source: Capital Data.
Note: Regions are defined as follows: Latin America: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Uruguay, Venezuela. Non-Japan Asia: Brunei, Burma, China, Special Administrative Region of Hong Kong, Indonesia, Laos, Macau, Malaysia, Nauru, North Korea, the Philippines, Samoa, Singapore, South Korea, Taiwan, Thailand, Vietnam. Emerging Europe: Bulgaria, Croatia, Romania, Russia, Turkey and Ukraine.

Chart S23 Precious metal prices

(Jan. 1999 - May 2005, index: Jan. 1999 = 100, prices in USD)



Source: Bloomberg.

Chart S24 Share of non-commercial futures positions in overall crude oil futures positions

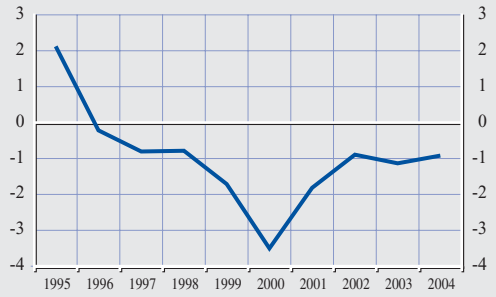
(Jan. 2001 - Apr. 2005, %)

Source: Commodity Futures Trading Commission (CFTC).

3 EURO AREA ENVIRONMENT

Chart S25 Net lending/borrowing of non-financial corporations in the euro area

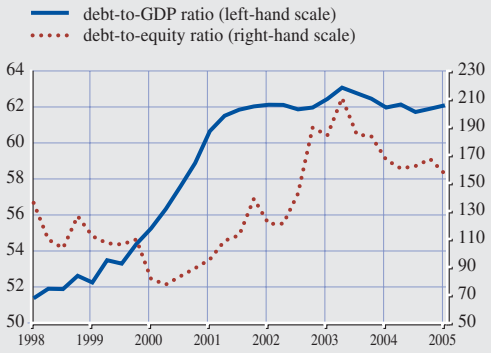
(1995-2004, financing gap, % of GDP)



Source: ECB.
Note: Data for 2004 are estimates using flow-of-funds projections.

Chart S26 Total debt of non-financial corporations in the euro area

(Q1 1998 - Q1 2005, %)



Source: ECB.

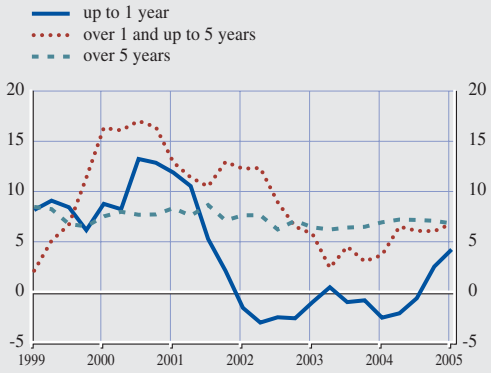
Chart S27 Total debt-to-financial asset ratio of non-financial corporations in the euro area

(Q1 1998 - Q3 2004, %)

Source: ECB.
Note: Data for 2004 are estimates.

Chart S28 Annual growth of loans to non-financial corporations in the euro area for selected maturities

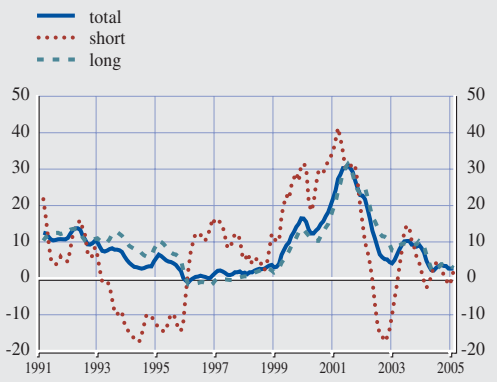
(Q1 1999 - Q1 2005, % per annum)



Source: ECB.
Note: Data are based on financial transactions of monetary and financial institutions' loans.

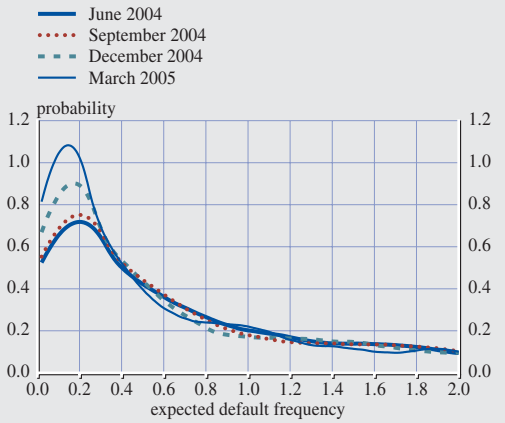
Chart S29 Annual growth of debt securities issued by non-financial corporations in the euro area

(Mar. 1991 - Feb. 2005, % per annum)



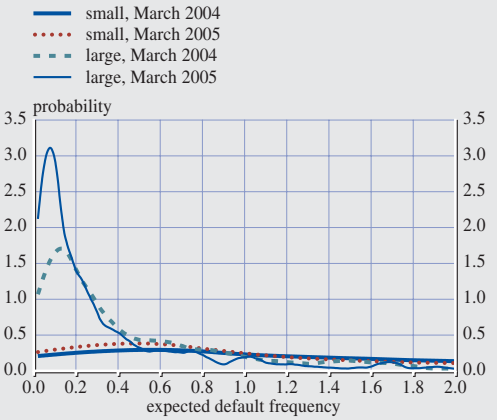
Source: ECB.

Chart S30 Euro area non-financial corporations' expected default frequency (EDF) distributions



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

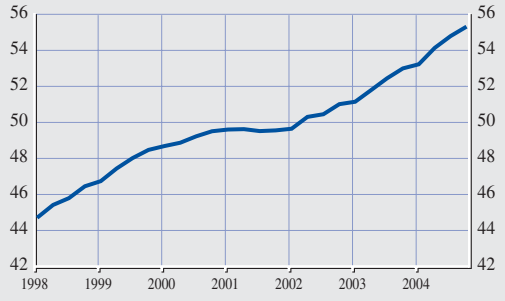
Chart S31 Expected default frequency (EDF) distributions for large and small euro area non-financial corporations



Sources: Moody's KMV and ECB calculations.
Note: The expected default frequency provides an estimate of the probability of default over the following year. Size is determined by the quartiles of the value of liabilities: small if in the lower and large if in the upper quartile of the distribution.

Chart S32 Household debt-to-GDP ratio in the euro area

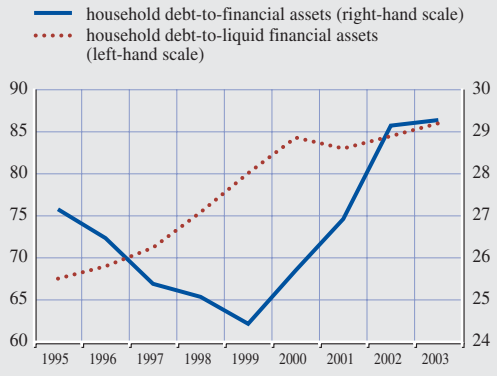
(Q1 1998 - Q4 2004, %)



Sources: ECB and Eurostat.
Note: Data for Q4 2004 are estimated on the basis of monetary data.

Chart S33 Ratios of household debt-to-financial assets and liquid financial assets in the euro area

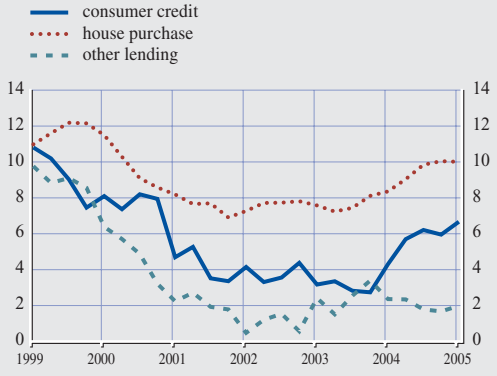
(1995-2003, %)



Source: ECB.

Chart S34 Annual growth of loans to households in the euro area

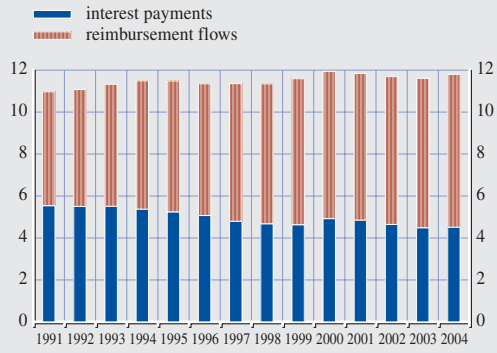
(Q1 1999 - Q1 2005, % per annum)



Source: ECB.
Note: Data are based on financial transactions of monetary and financial institutions' loans.

Chart S35 Total debt servicing burden of the euro area household sector

(1991-2004, % of disposable income)

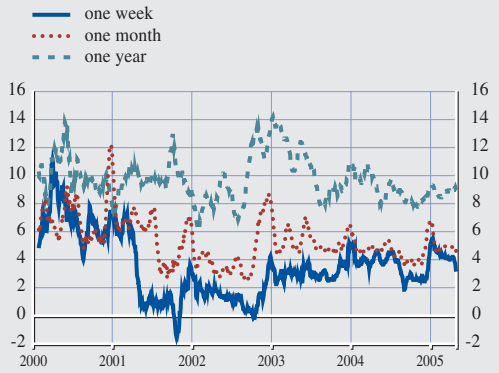


Source: ECB calculations.
Note: Data for 2004 are estimates.

4 EURO AREA FINANCIAL MARKETS

Chart S36 Euro area spreads between interbank deposit and repo interest rates

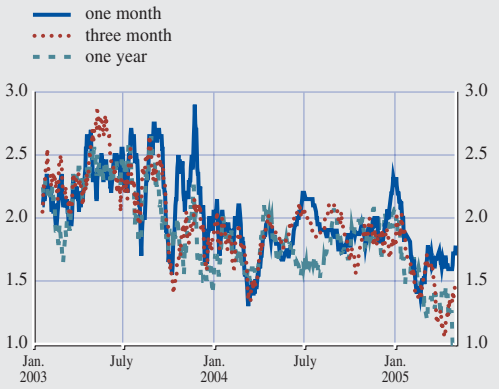
(Jan. 2000 - May 2005, basis points, 20-day moving average)



Source: ECB.

Chart S37 Bid-ask spreads for EONIA swap rates

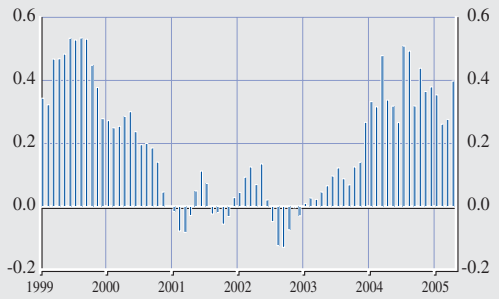
(Jan. 2003 - May 2005, basis points, 20-day moving average)



Source: ECB.

Chart S38 Option-implied skewness coefficient for ten-year bond yields in Germany

(Jan. 1999 - Apr. 2005, average monthly skewness)



Sources: Eurex and ECB calculations.

Chart S39 Stock prices in the euro area

(Jan. 2002 - May 2005, Dow Jones EURO STOXX, index: Jan. 2003 = 100)

Source: Reuters.

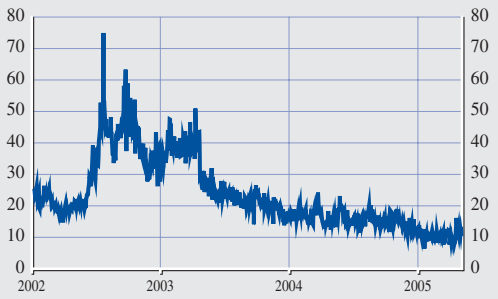
Chart S40 Price earnings (P/E) ratio for the euro area stock market

(Jan. 1983 - Apr. 2005, %, ten-year trailing)

Source: Thomson Financial Datastream.
Note: The price-earnings ratio is based on prevailing stock prices relative to an average of the previous ten years of earnings.

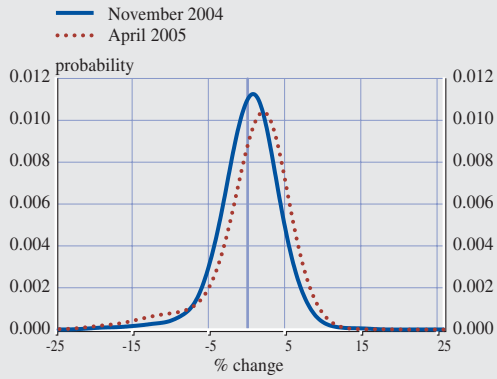
Chart S41 Implied volatility for the Dow Jones EURO STOXX 50 index

(Jan. 2002 - May 2005)



Source: Bloomberg.

Chart S42 Option implied probability distribution function for the Dow Jones EURO STOXX 50 index



Sources: Bloomberg and ECB calculations.

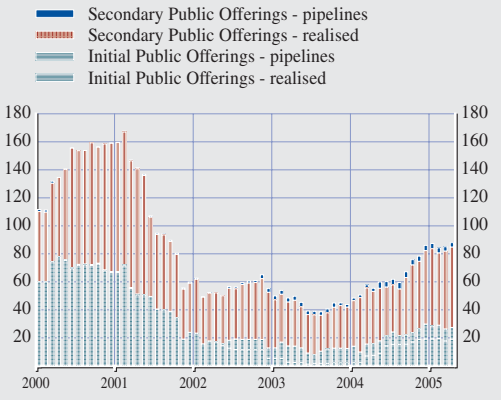
Chart S43 Open interest in options contracts on the Dow Jones EURO STOXX 50 index

(Jan. 1999 - Apr. 2005, millions of contracts)

Source: Eurex.

Chart S44 Gross equity issuance and pipeline deals in the euro area

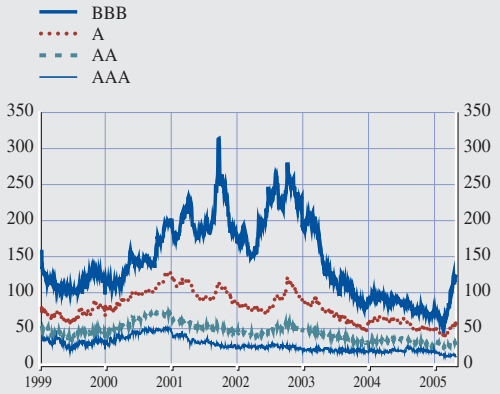
(Jan. 2000 - Apr. 2005, EUR billions, 12-month moving sums)



Source: Thomson Financial Datastream.

Chart S45 Corporate bond spreads in the euro area

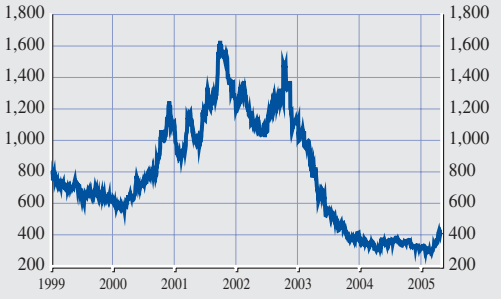
(Jan. 1999 - May 2005, basis points)



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

Chart S46 Spreads on euro area high-yield corporate bonds

(Jan. 1999 - May 2005, basis points)

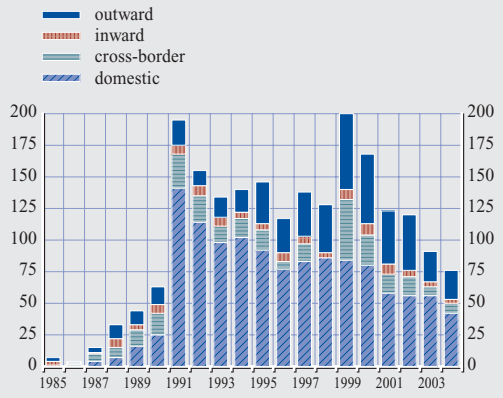


Source: JP Morgan Chase & Co.
Note: Spread between yield to maturity of euro area high-yield index (BB+ rating or below, average maturity of 5.5 years) and euro area five-year government bond yield.

5 EURO AREA FINANCIAL INSTITUTIONS

Chart S47 Number of euro area banking sector mergers and acquisitions (M&A)

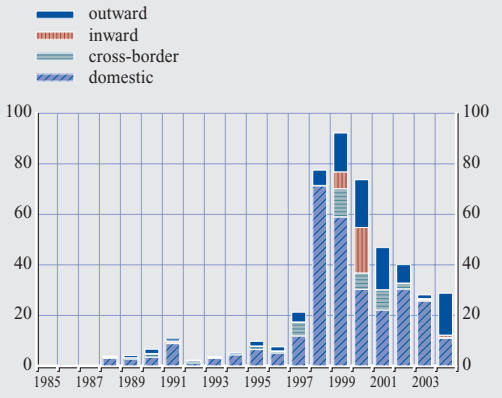
(1985-2004, number of deals)



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.

Chart S48 Value of euro area banking sector mergers and acquisitions (M&A)

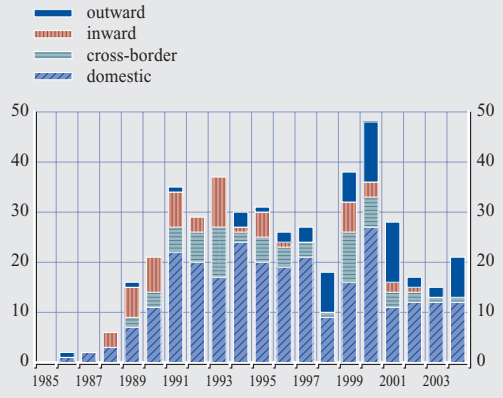
(1985-2004, value of deals, EUR billions)



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.

Chart S49 Number of mergers and acquisitions (M&A) between banks and insurance companies in the euro area

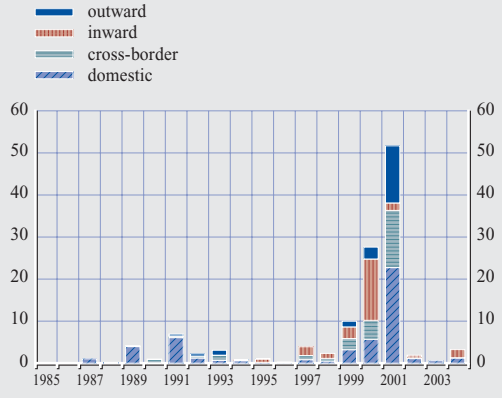
(1985-2004, number of deals)



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.

Chart S50 Value of mergers and acquisitions (M&A) between banks and insurance companies in the euro area

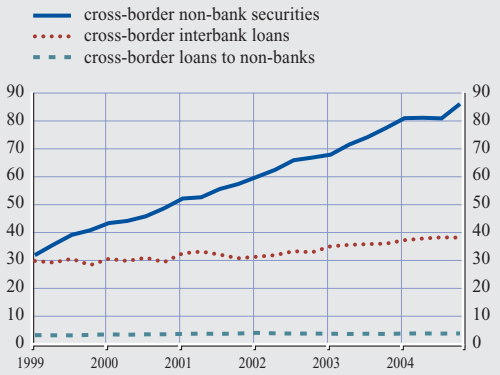
(1985-2004, value of deals, EUR billions)



Sources: Thomson Financial SDC and ECB calculations.
Note: Deals include both controlling and minority stakes.

Chart S51 Cross-border activity of euro area MFIs

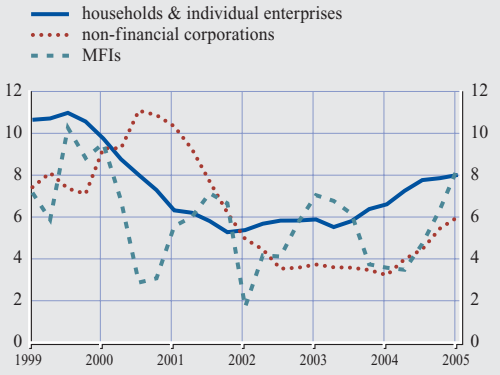
(Q1 1999 - Q4 2004, % of total domestic outstanding amounts)



Source: ECB.
Note: Cross-border activity refers to cross-euro area activity (i.e. it excludes international activities in non-euro area and third countries).

Chart S52 Annual growth of euro area MFI loans extended by sector

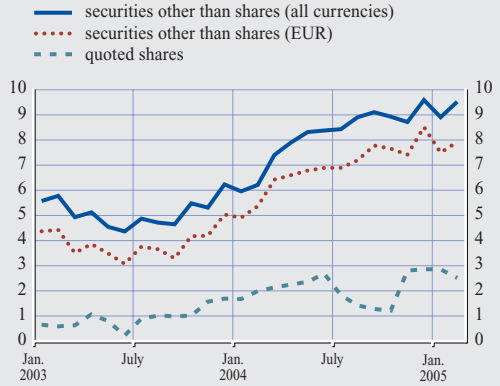
(Q1 1999 - Q1 2005, % per annum)



Source: ECB.
Note: Data are based on financial transactions of monetary and financial institutions' loans.

Chart S53 Annual growth of euro area MFIs' securities and shares issuance

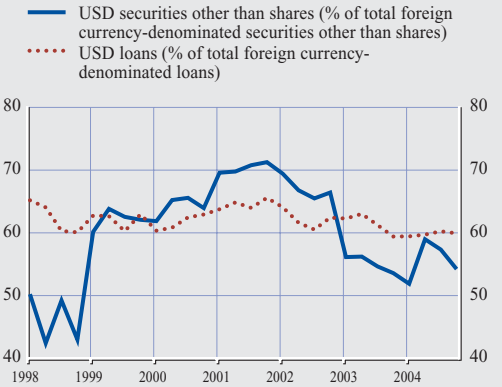
(Jan. 2003 - Feb. 2005, % per annum)



Source: ECB.

Chart S54 Euro area MFIs' foreign currency-denominated assets, selected balance sheet items

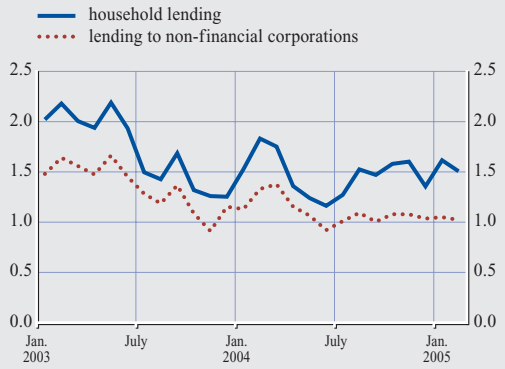
(Q1 1998 - Q4 2004)



Source: ECB.

Chart S55 Lending margins of euro area MFIs

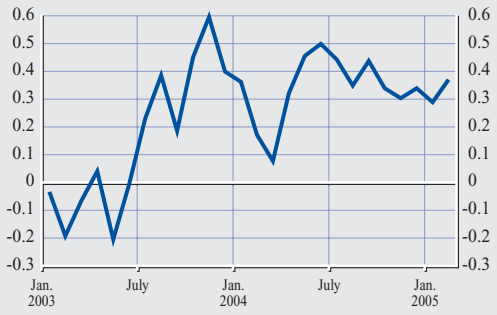
(Jan. 2003 - Feb. 2005, % points)



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 S56 Deposit margin of euro area MFIs

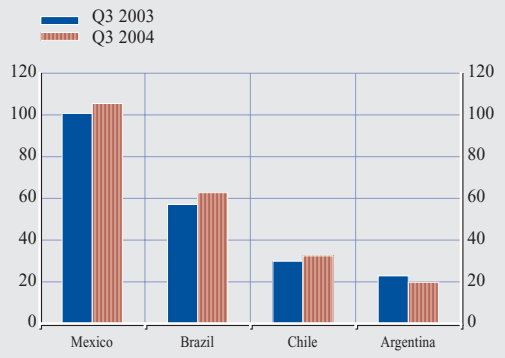
(Jan. 2003 - Feb. 2005, % points)



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 S57 International exposure of euro area banks to Latin American countries

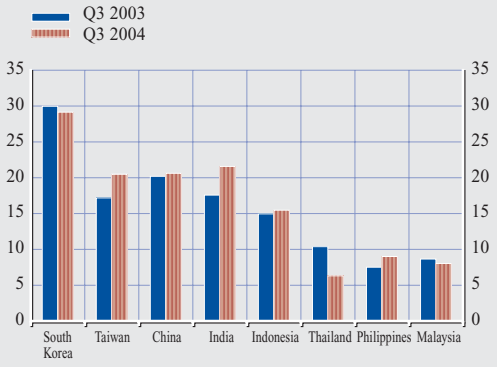
(USD billions)



Source: Bank for International Settlements (BIS).

Chart S58 International exposure of euro area banks to Asian countries

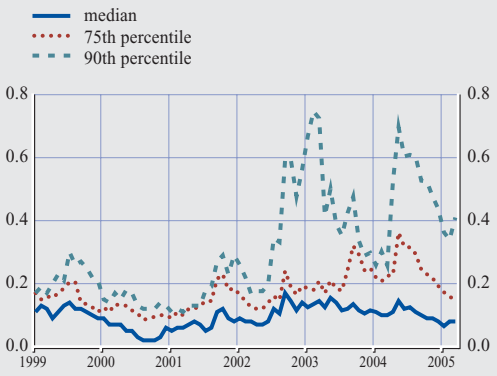
(USD billions)



Source: Bank for International Settlements (BIS).

Chart S59 Expected default frequencies (EDF) for large euro area banks

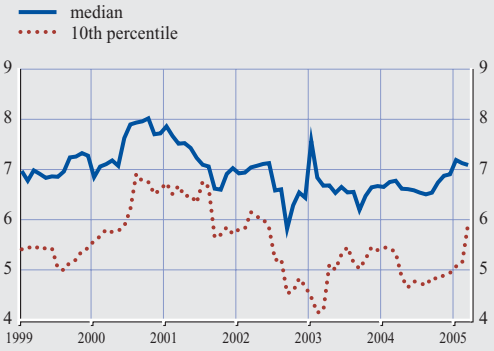
(Jan. 1999 - Apr. 2005, probability out of 100)



Sources: Moody's KMV and ECB calculations.

Chart S60 Distance to default for large euro area banks

(Jan. 1999 - Mar. 2004)



Sources: Moody's KMV and ECB calculations.
Note: An increase in the distance to default reflects an improving assessment.

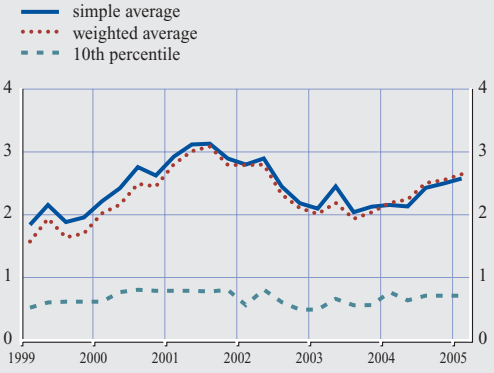
Chart S61 European financial institutions' credit default swaps on senior and subordinated debt

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

Source: JP Morgan Chase & Co.
Note: European financial institutions corresponds to JP Morgan Chase & Co.'s definition.

Chart S62 Large euro area banks' earnings per share (EPS)

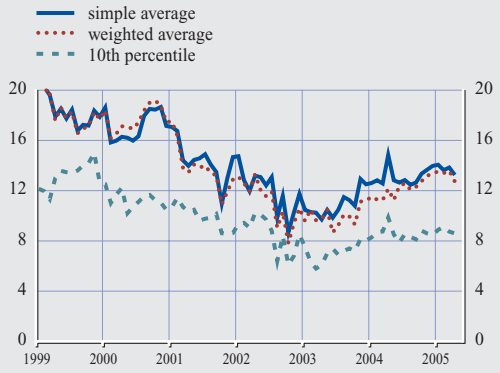
(Q1 1999 - Q1 2005, %)



Sources: Thomson Financial Datastream and ECB calculations.

Chart S63 Price-earnings (P/E) ratios for large euro area banks

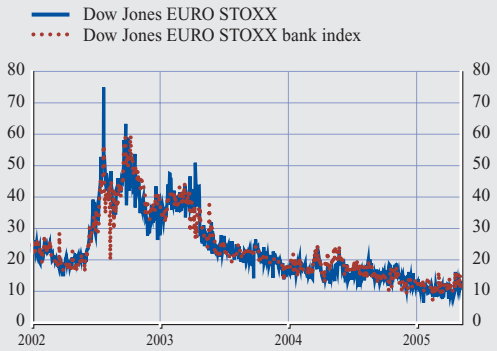
(Jan. 1999 - Apr. 2005, %)



Sources: Thomson Financial Datastream and ECB calculations.

Chart S64 Implied volatility for Dow Jones EURO STOXX total market and bank indices

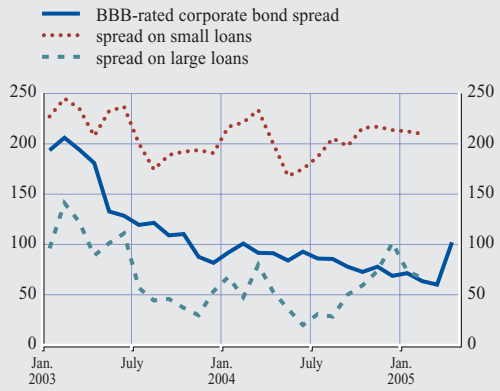
(Jan. 2002 - May 2005)



Source: Bloomberg.

Chart S65 Euro area corporate bond and bank loan spreads

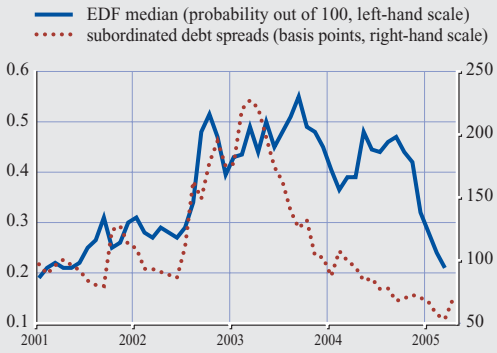
(Jan. 2003 - Apr. 2005, basis points)



Sources: ECB and Thomson Financial Datastream.
Note: Spread between rate on loans to non-financial corporations with one up to five years' initial rate fixation below (small) and above (large) 1 EUR million, and the three-year government bond yield.

Chart S66 Subordinated bond spreads and expected default frequencies (EDF) for the euro area life insurance industry

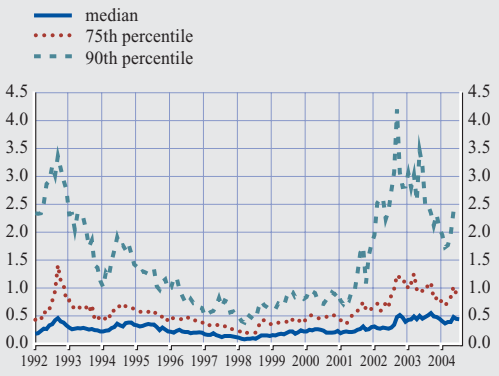
(Jan. 2003 - Apr. 2005)



Sources: Moody's KMV and JP Morgan Chase & Co.

Chart S67 Expected default frequencies (EDF) for the euro area life insurance industry

(Jan. 1992 - Mar. 2005, probability out of 100)



Source: Moody's KMV.

Table S3 Euro area consolidated foreign claims of reporting banks on individual countries

(USD billions)

	2002 Q1	2002 Q2	2002 Q3	2002 Q4	2003 Q1	2003 Q2	2003 Q3	2003 Q4	2004 Q1	2004 Q2	2004 Q3
Total all countries	**3,102.0**	**3,358.1**	**3,356.2**	**3,645.1**	**3,850.3**	**4,171.3**	**4,150.3**	**4,348.7**	**4,828.3**	**4,815.5**	**4,892.8**
Hong Kong	27.4	28.1	30.2	25.2	26.3	30.3	30.0	31.9	35.3	36.3	36.7
Singapore	28.3	22.1	29.3	24.9	31.4	31.0	31.6	29.1	34.8	34.1	34.2
Total offshore centres	**241.3**	**238.5**	**247.0**	**237.8**	**269.4**	**272.8**	**290.6**	**302.4**	**331.6**	**343.6**	**364.6**
China	15.8	17.7	17.4	16.0	18.5	19.0	20.2	19.0	20.4	22.5	20.6
India	11.6	11.6	11.1	13.9	14.7	15.9	17.6	18.4	21.4	21.1	21.6
Indonesia	14.1	14.9	14.6	14.6	14.7	15.8	15.0	15.2	15.2	14.4	15.5
Malaysia	7.5	7.4	7.2	7.2	7.4	8.2	8.7	8.7	8.4	7.9	8.0
Philippines	6.3	6.5	6.8	6.7	6.6	6.9	7.5	7.5	8.8	8.7	9.0
South Korea	19.6	20.6	20.7	21.7	23.6	27.0	30.0	29.9	32.9	31.4	29.1
Taiwan	8.2	10.1	12.0	11.1	11.7	13.6	17.2	17.9	22.1	23.7	20.5
Thailand	11.1	10.6	10.5	9.5	9.6	9.5	10.4	9.9	10.1	9.3	6.3
Total Asia and Pacific EMEs	**107.1**	**113.6**	**114.8**	**115.0**	**121.6**	**130.9**	**142.9**	**145.1**	**160.3**	**162.0**	**151.4**
Russia	28.6	23.2	24.0	24.1	24.3	25.8	28.0	33.3	37.1	34.2	34.2
Turkey	19.5	20.4	19.4	20.3	20.6	20.5	20.8	22.5	22.7	23.3	23.6
Ukraine	0.9	0.9	0.8	0.9	0.9	1.1	1.3	1.8	1.8	2.2	2.4
Total European EMEs	**197.2**	**214.3**	**219.5**	**236.6**	**244.2**	**256.0**	**270.6**	**322.8**	**330.1**	**342.0**	**353.1**
Argentina	25.3	23.2	23.3	23.3	23.5	23.1	22.9	21.6	20.3	19.8	19.8
Brazil	69.2	64.7	54.8	55.4	51.2	54.4	57.1	59.4	59.1	58.4	62.7
Chile	29.7	28.6	27.6	28.5	29.3	29.2	29.9	32.6	31.9	31.0	32.5
Colombia	8.2	8.1	7.4	6.9	6.8	6.7	6.7	6.4	6.8	6.7	6.9
Ecuador	0.6	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.9
Mexico	108.0	106.6	98.2	100.6	98.2	100.7	100.7	103.9	106.6	107.2	105.5
Peru	10.7	10.9	10.8	9.2	8.7	9.8	9.2	9.5	9.3	9.5	9.6
Uruguay	4.9	3.0	2.8	2.5	2.2	2.0	2.1	2.0	1.9	2.0	2.0
Venezuela	12.4	10.8	10.5	11.1	10.5	10.8	11.7	13.1	12.1	12.5	12.7
Total Latin American and Caribbean	**277.8**	**265.7**	**245.2**	**247.0**	**239.9**	**245.9**	**249.8**	**258.4**	**258.0**	**256.5**	**261.3**

Source: Bank for International Settlements (BIS).