2 Risks in the international financial system: key points

Financial market developments since the June *Review* have been consistent with favourable macroeconomic conditions. Global economic growth has remained robust and inflation expectations contained. Large complex financial institutions (LCFIs) have benefited from high rates of return on their equity and hold substantial cushions of capital. The downside risk that market yield curves might rise sharply in response to the recent increases in US official interest rates, prompting wider asset price volatility, did not materialise; and measures of realised and expected asset price volatility are generally lower.

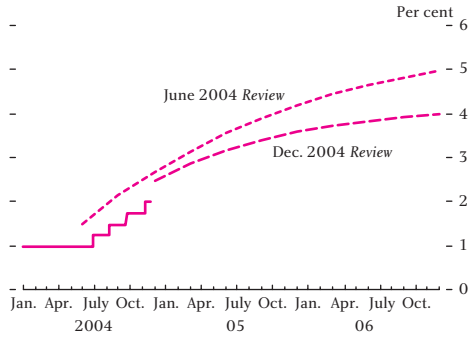
But despite the benign operating environment, there remains the possibility that financial market participants may be underestimating key vulnerabilities and mis-pricing market risks. In particular:

- Financial intermediaries and investors appear to have continued their 'search for yield' in a wide range of markets, holding positions that could leave them vulnerable to instability in the pattern of global capital flows and exchange rates, credit events or sharper-than-expected interest rate rises. A number of market participants have also discussed the possibility that risk is being underpriced. In the event of an adverse shock, any over-accumulation of exposures from the mis-pricing of assets may result in an abrupt, and costly, adjustment of balance sheets;

- Hedge funds continue to experience strong inflows from investors. Given the relatively modest returns on many hedge fund strategies, some are increasing their involvement in less liquid markets. LCFIs face a number of challenges. These include low margins and subdued demand for traditional investment banking services, which has prompted expansion into other activities, including commodity markets and provision of prime brokerage services to hedge funds. LCFIs may also need to tackle the consequences of regulatory investigation and litigation, as well as manage their participation in the rapidly growing structured credit markets;

- Large UK-owned banks have also been active in international financial markets, and their gross inter-bank exposure to foreign-owned financial institutions, including LCFIs, is sizeable. This leaves them exposed to potentially significant counterparty credit risks. And they face market risk, through both their trading books and banking books.

Chart 2.1
US dollar money market yield curves[a][b]

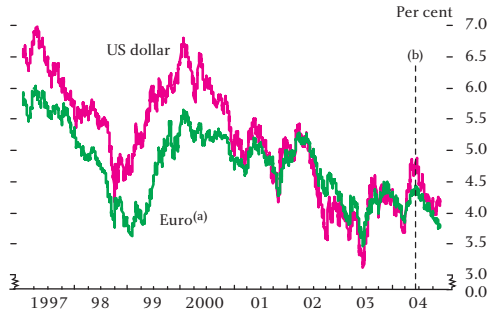


Source: Chicago Mercantile Exchange and Bloomberg.

(a) The solid line is the US policy interest rate, ie the Fed Funds target rate.

(b) The dotted and dashed lines are money market yield curves implied from three-month US dollar interest rate futures.

Chart 2.2
Ten-year nominal government bond yields

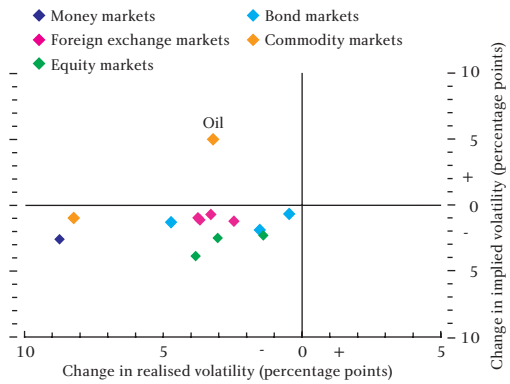


Source: Bloomberg.

(a) German bonds represent the euro.

(b) June 2004 *Review*.

Chart 2.3
Volatility of financial markets[a][b][c][d]



Sources: Bloomberg, Chicago Mercantile Exchange, LIFFE, New York Mercantile Exchange, Reuters and Bank calculations.

(a) Implied volatility calculated from three-month option prices (or as near to three months as possible).

(b) Realised volatility calculated as a 60-day rolling annualised standard deviation of returns.

(c) Changes between June 2004 and Dec. 2004 *Reviews*.

(d) Multiple data points for each market category indicate different financial instruments.

2 Risks in the international financial system

2.1 International financial markets

The market environment

At the time of the June 2004 *Review*, economic data suggestive of a stronger global cyclical upswing, particularly in the United States, had prompted upward revisions to financial markets' expectations of the path of official interest rates. Perhaps the major near-term challenge preoccupying financial intermediaries and traders was their exit strategies from a variety of positions characterising the 'search for yield' described in previous *Reviews*.[1]

In the event, while increasing official interest rates by 25 basis points four times during this period, the US Federal Open Market Committee (FOMC) has repeated "that policy accommodation can be removed at a pace that is likely to be measured".[2] The effect of this on financial markets, together with generally less strong economic data in the summer and early autumn, particularly in the United States, and rising oil prices, seems to have been to support the view that US official interest rates will not rise as far, or as soon, as anticipated in the spring (Chart 2.1).

Partly against that background, government bond yields have fallen back at longer maturities (Chart 2.2); credit spreads have continued to narrow; and equity markets are for the most part higher. Actual volatility, and expected volatility implied by options, has declined in many markets (Chart 2.3). More generally, financial intermediaries and investors have maintained many of the strategies characterising the 'search for yield'.

The current pattern of financial asset prices is, for some market participants, consistent with a benign economic outlook – a view which emphasises actual and expected global growth, well-anchored inflation expectations, and generally stronger corporate and emerging-market sovereign balance sheets.

The sustainability and the possible longer-run implications of the 'search for yield' continue, however, to be widely discussed. Concerns centre on two possible adjustment mechanisms, which could have an impact on the stability of the financial system. In the shorter term, there could be an asset price correction at some point in particular markets, perhaps with spillovers to other parts of the system. A second risk is of credit problems over a

(1) See the June 2004 *Review*, pages 47–48, and the December 2003 *Review*, pages 17–18.

(2) See, for example, the Federal Reserve Board's Monetary Policy Report submitted to the US Congress in July 2004.

longer period, possible if a sustained mispricing of credit risk resulted in an overaccumulation of debt.

In this context, many commentators and market participants have contrasted the apparently benign outlook implied by financial asset prices with the range of uncertainties and sources of downside risk that they continue to perceive. Those enumerated by practitioners include: concerns about the sustainability of the current pattern of global capital flows; the possibility of more aggressive tightening of official interest rates than is currently implied by yield curves; risks to global growth from higher oil and other industrial commodity prices; and, perhaps, an event that precipitates a more general repricing of credit risk. On this view, low implied volatility in some markets is a puzzle, and may reflect implied volatility largely tracking realised volatility – which has declined in many markets – rather than being forward-looking.

Some possible downside risks

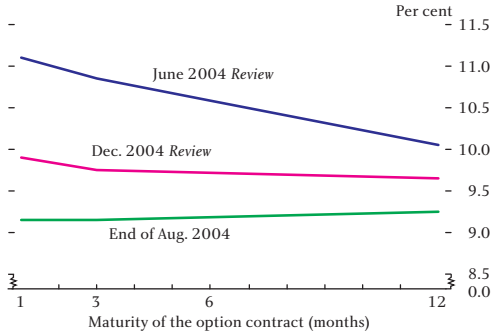
Foreign exchange markets

For much of the period, the major exchange rates were relatively stable, and implied, as well as actual, volatility fell. This encouraged a re-emergence of carry trades, with short positions against the US dollar funding long positions in, for example, the Canadian dollar, the euro and, early in the period, sterling.

Later in the period, the US dollar depreciated (by 5.9% on an effective basis over the period as a whole): the euro and some Asian currencies appreciated. Currency implied volatilities, which had fallen earlier in the period, rose (Chart 2.4). In part, this appeared to reflect renewed market concerns about the stability of the current pattern of international capital flows, given the large external financing needs of the United States. Foreign portfolio flows – including official flows – have tended in recent years to be more concentrated in US debt markets: as well as US Treasuries, these have included the Government Sponsored Enterprises (GSEs) and US corporate bonds (Chart 2.5). A potential risk, therefore, is that any reduction in the share of foreigners' saving going into these assets could affect their required return, with actual returns adjusting via some combination of a fall in dollar exchange rates and falls in the dollar price of these assets.

The June 2004 *Review* noted that the exchange rate policies and investment strategies of a number of Asian authorities would be relevant to developments in currency and interest rate markets. Recent price movements in the renminbi non-deliverable forward market suggest that market participants have increased their expectation of a change in China's exchange rate policies (Chart 2.6). Some commentators have described the current arrangements as akin to a *de facto* second 'Bretton Woods' system.[1] Market contacts have suggested that the stability

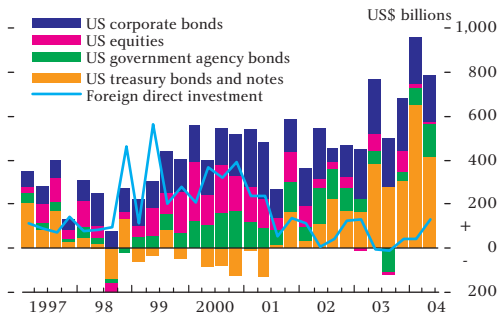
Chart 2.4
Term structure of implied volatility for the US dollar/yen bilateral exchange rate[a]



Sources: RBS Markets and Bank calculations.

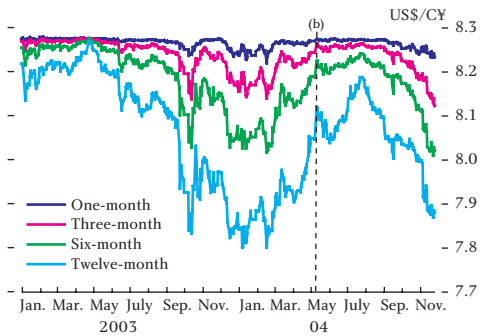
(a) Implied volatility calculated from option prices.

Chart 2.5
Foreign net purchases of long-term US securities



Sources: Federal Reserve Bank and Bank calculations.

Chart 2.6
Chinese yuan non-deliverable forwards[a]



Source: JP Morgan Chase & Co.

(a) Non-deliverable forwards are used to speculate in non-convertible or restricted currencies (such as quasi-fixed exchange rate regimes). Contracts involve no exchange of principal and are usually settled in US$.

(b) June 2004 *Review*.

implied by this is an important consideration underpinning carry trades of various types as part of the 'search for yield' in currency and interest rate markets. To the extent that the official policies on which this anticipation of stability is based proved to be less durable than markets generally appear to expect, there is a risk of potentially abrupt movements in currency and interest rate markets. For some currency pairs, for example dollar/yen, any large adjustment might be complicated by hedging in options markets, notably in relation to so-called power reverse dual currency notes, as discussed in previous *Reviews*.[2]

Interest rate markets

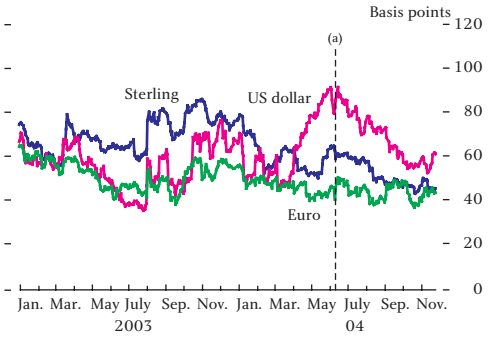
Near-term uncertainty in the market about the course of monetary policy has apparently fallen since the spring (Chart 2.7). However, a risk that policy rates in the major economies could rise further and sooner than markets currently anticipate has been identified by a number of market participants. Indeed, the published results of a number of large US banks reveal that they had been positioned accordingly in the first half of the review period, particularly on the US yield curve, sustaining losses on those positions (Chart 2.8) (see also Chapter 1.3). Proprietary survey data were also consistent with many asset managers having expressed the same view (in the sense of being short relative to their interest rate duration benchmarks). The closing of outright short, or short-of-duration-benchmark, positions in US fixed-income markets has been suggested as one factor amplifying the decline in US yields. At the same time, market contacts have suggested that others – particularly perhaps in the official sector – may have been lengthening the duration of their portfolios.

It is hard to know the extent to which financial intermediaries have hedged their exposures to interest rate risk. Some have suggested that hedging was one element in large interest rate options trades seen on US and UK exchanges in the autumn. However, were the risk of sharply higher yields to materialise – as anticipated by some in the spring – it is possible that financial intermediaries would face quite a challenge in managing the various strategies that constitute the 'search for yield', with potential knock-on effects to, for example, swap and credit spreads.

Equity markets

Equity markets in the major industrial economies have for the most part risen since the previous *Review* (Chart 2.9). Despite

Chart 2.7
Short-term interest rate uncertainty[a]

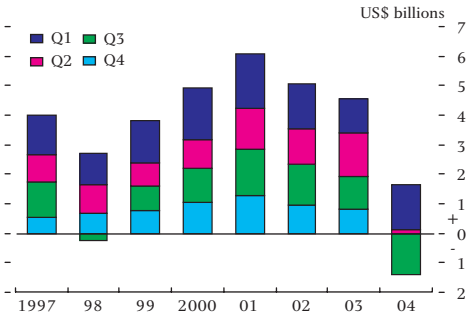


Sources: LIFFE, Chicago Mercantile Exchange and Bank calculations.

(a) Six-month volatilities implied from at-the-money options on three-month interest rate futures.

(b) June 2004 *Review*.

Chart 2.8
Interest rate trading book revenues for US banks and savings institutions[a][b]



Source: Federal Deposit Insurance Corporation.

(a) Trading revenues comprises gains/losses on positions and fees.

(b) For banks and savings institutions with assets greater than US$100 million. From March 2000, those with trading assets less than US$2 million are exempt from the reporting requirement.

(1) Dooley, M, Folkerts-Landau, D and Garber, P (2003), 'An essay on the revived Bretton Woods system', NBER Working Paper no.9971 (September); and Obstfeld, M and Rogoff, K (2004), 'The unsustainable US current account position revisited', NBER Working Paper no.10869 (October).

(2) See 'Box 3: Structured notes and the US dollar/yen exchange rate' in the June 2003 *Review*, page 43.

moderating corporate earnings growth and higher oil prices, equity markets appear to have been supported by lower risk-free rates. One category of downside risk that some market participants have identified is a shock to global oil supply, resulting in oil prices rising significantly higher than recent levels, and so potentially sufficient both materially to reduce global growth and to raise inflation expectations. While this would represent a material downside risk to global equity markets, options-derived skews on major equity indices have become slightly less negative over the review period (Chart 2.10).

High corporate profitability in some of the major economies has resulted in companies returning cash to shareholders in the form of higher dividends and share buy-backs. As well as releveraging balance sheets, this may, at least in the short run, have added further liquidity to the 'search for yield' by investors as the cash is redeployed.

Risks from the corporate sector

Another downside risk is a credit event that resulted in a, perhaps abrupt, repricing of risk. Potential sources of such risk might include a crystallisation of difficulties in a particular sector – possible examples are automobile manufacturing or the aviation industry – that resulted in a significant credit ratings downgrade, or even administration, for a particular firm. Alternatively, regulatory or judicial investigations and actions might have a sufficient impact in particular industries to result in significant movements in the prices of their debt and equity. The insurance sector has been a recent focus for the markets in this respect, with the price of default protection rising markedly for a brief period (Chart 2.11).

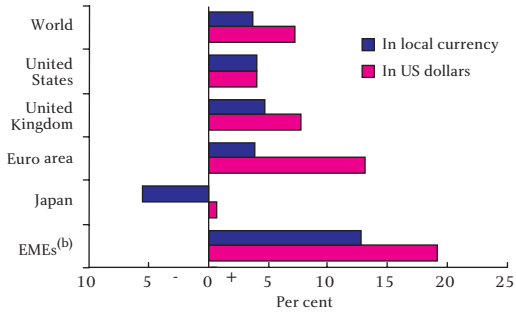
The global insurance industry has also been confronted with an unusually high frequency of natural catastrophes since the previous *Review*, notably the US hurricane season. Losses will be mostly borne by US primary insurers. Global reinsurers were little affected, partly because the losses were spread over a number of discrete events, rather than one large event.

Less liquid markets

The risks outlined above have been the subject of stress tests by a number of financial intermediaries. Should any of them crystallise, a degree of comfort can be taken from the depth and liquidity of the major traded markets, and indeed from the generally strong balance sheets of the large complex financial institutions in particular. Market participants have, however, suggested that some other markets, which have experienced recent rapid growth associated with the 'search for yield', but which remain less liquid, could be vulnerable to less orderly adjustment.

An example of this was apparent in late summer when there were reports of large-scale sales of Japanese and other Asian

Chart 2.9
Regional equity index performance[a]

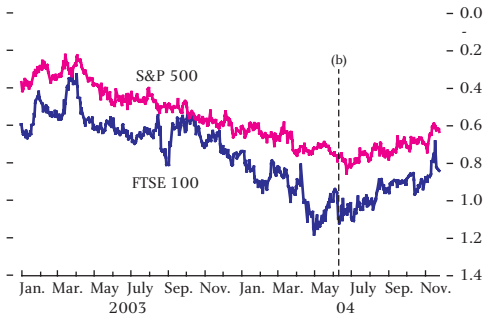


Sources: Morgan Stanley Capital International, Bloomberg and Bank calculations.

(a) Percentage change in market capitalisation weighted indices between the June 2004 *Review* and Dec. 2004 *Review*.

(b) Emerging market economies.

Chart 2.10
Implied equity index skews[a]

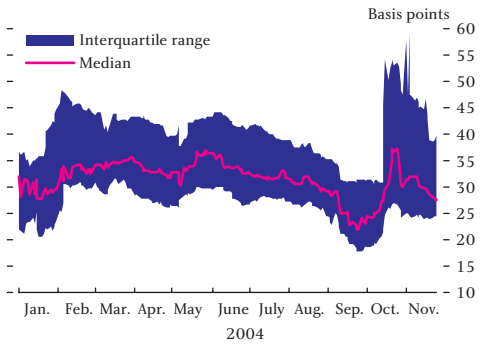


Sources: Chicago Mercentile Exchange, LIFFE and Bank calculations.

(a) A negative skew indicates there are more extreme outcomes below the mean of the distribution than there are above.

(b) June 2004 *Review*.

Chart 2.11
CDS premia for large insurers[a][b]

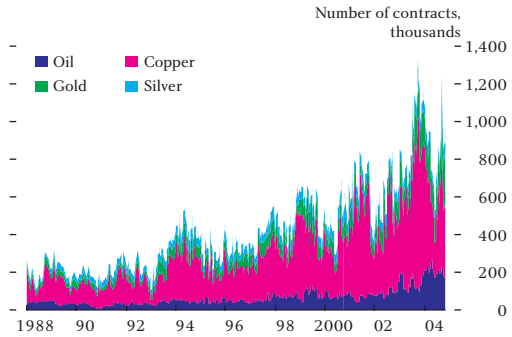


Source: Markit.

(a) Includes multi-line and monoline insurers, reinsurers and insurance brokers.

(b) Annual premia for credit protection on issuers using ISDA documentation, measured as mid-point between last bid and ask quotes of five-year senior debt CDS contracts.

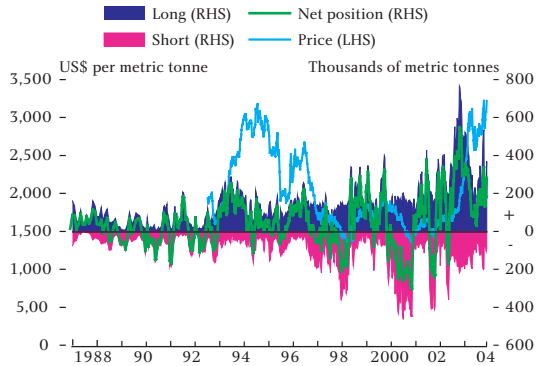
Chart 2.12
Speculative positions in commodity futures[a]



Sources: Commodity Futures Trading Commission and Bank calculations.

(a) Sum of long and short non-commercial positions, ie positions unrelated to commercial hedging activities.

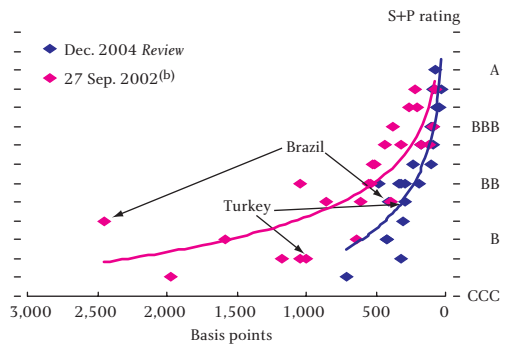
Chart 2.13
Speculative positions in copper futures[a]



Sources: Commodity Futures Trading Commission and Bank calculations.

(a) Non-commercial positions, ie positions unrelated to commercial hedging activities.

Chart 2.14
Sovereign credit rating and bond spreads for selected EMEs[a]



Sources: JP Morgan Chase & Co. and Standard & Poor's.

(a) Lines represent logarithmic best-fit lines. Ratings are plotted linearly.

(b) Peak in bond spreads.

convertible bonds by hedge funds and bank trading desks. This appears to have been prompted by falls in the mark-to-market value of convertible bonds as implied equity volatility declined, perhaps exacerbated by retail investors effectively selling volatility by purchasing structured notes with embedded optionality.[1]

Commodity markets

The sharp rise in commodity prices has drawn new capital into these markets. Data on speculative positioning bear this out to an extent (Chart 2.12). Many have associated the sharp single-day fall in some industrial metals prices in the autumn with speculative activity (Chart 2.13). At the same time, investors are turning their attention to commodity markets, as part of a wider trend towards increasing their portfolio allocations to so-called 'alternative asset classes'.[2] In many cases, their exposures to the commodities sector appear to take the form of investments in products linked to commodity indices; or of investments in, for example, those hedge funds that trade commodity markets.

Emerging market economies (EMEs)

Just as the widening of credit spreads in the spring was particularly pronounced for emerging market sovereign and corporate debt, so too has been the subsequent spread narrowing. EME equity prices have also risen strongly, especially in emerging Europe and Latin America.

Low funding costs have resulted in strong foreign currency issuance of bonds and syndicated loans this year, especially by EME companies (see Chapter 1). Some contacts have drawn attention to record high sales of heavily over-subscribed issues of Russian corporate bonds, despite concerns about property rights highlighted by the Yukos case and difficulties in the banking sector. More generally, the narrowing of sovereign spreads since their peak in autumn 2002 suggests a significantly larger perceived reduction in credit risk than do ratings agencies' credit upgrades, especially among lower credit quality sovereigns (Chart 2.14). However, models of spreads based on fundamentals suggest that EME spreads remain higher than predicted.

Market contacts report that the 'search for yield' in EMEs, in particular via carry trades, has re-emerged. However, there have also been suggestions that recent flows into EMEs, which have

(1) See 'Box 5: Convertible bond arbitrage' in the June 2001 *Review*, page 73; and Rule, D, Garratt, A and Rummel, O (2004), 'Structured note markets: products, participants and links to wholesale derivatives markets', Bank of England *Financial Stability Review*, June.

(2) See the box 'Search for alpha' in the *Bank of England Quarterly Bulletin* Autumn 2004, pages 272–273.

increased further in 2004 (Chart 2.15), will be less prone to reversal. Hedge funds and institutional investors are reported to be showing interest in EMEs on a longer-term basis than in the mid-to late-1990s. It is difficult to evaluate such judgments, since they are not dissimilar from those made in the mid-1990s. A protracted period of stability, with more modest returns than during the recent rally, may be necessary to embed these holdings in long-term portfolios.

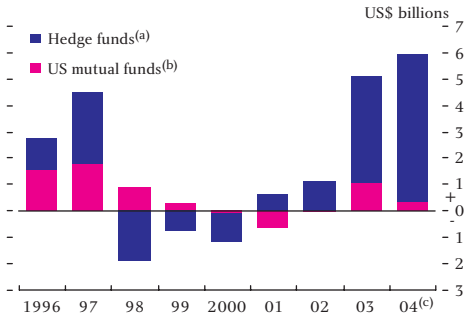
Credit markets

Since the relatively brief repricing of risk and tightening of credit conditions in the spring, many of the trends in credit markets described in the June 2004 *Review* have re-emerged, and in some cases may have intensified (Chart 2.16). A general narrowing of credit spreads is consistent with an improved outlook for corporate credit risk; only a few troubled sectors, such as airlines and the automobile industry, are exceptions. With generally modest demand for net external finance, spreads have fallen to equilibrate the demand for credit risk exposure with supply. The questions are whether risk is being priced properly, and to what extent the search for yield is leading to excessive leverage – for example in the leveraged buy-out and structured credit markets. Issuance by sub-investment-grade companies has remained relatively high, which in the past has been a precursor of an increase in defaults (Chart 2.17).

In the syndicated loan market, contacts report lengthening maturities and further weakening in terms and conditions. This is particularly the case for leveraged loans, for which demand has continued to be strong in the United States and Europe (Chart 2.18). Leverage multiples are reported to be near late-1990s highs (including examples of over six times equity), and covenants have been relaxed. However, the market may now be less concentrated by industry sector than in the late-1990s (when the focus was the technology, media, and telecommunications sector), although refinancing of cable companies has been one pocket of concentration in Europe. It also seems that risk transfer may be aided by a greater share of loan issuance being taken up by non-banks, including, for the moment, hedge funds; and by greater syndication of loans bridging to high-yield debt issuance – although it remains to be seen to what extent these developments will persist if credit conditions tighten.

Risk transfer also increasingly occurs via the structured credit markets, which have continued to expand very rapidly. One driver is said to have been European and Asian regional banks seeking to increase their international credit exposures synthetically, apparently on the view that they could build a higher quality and more diversified book more easily that way than in the cash loan markets.

Chart 2.15
Investment in EME securities



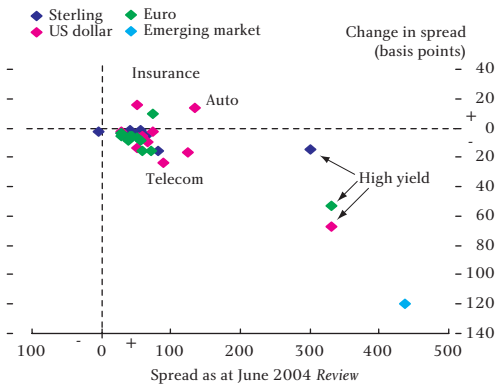
Sources: TASS Research, Investment Companies Institute and Bank calculations.

(a) Net capital inflows into EME hedge funds reporting to TASS.

(b) Institutional investment in EME equity US mutual funds.

(c) Data for 2004 are annualised.

Chart 2.16
Changes in regional and sectoral bond yield spreads(a)(b)(c)



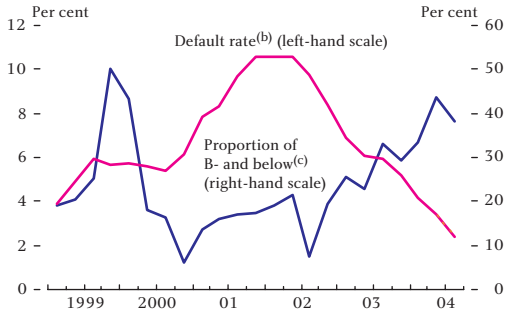
Sources: Merrill Lynch and Bank calculations.

(a) Spread over swaps.

(b) Each point represents a bond index from the Merrill Lynch Global Index System.

(c) Changes in spread between the June 2004 *Review* and Dec. 2004 *Review*.

Chart 2.17
US bond issuance versus default rate(a)



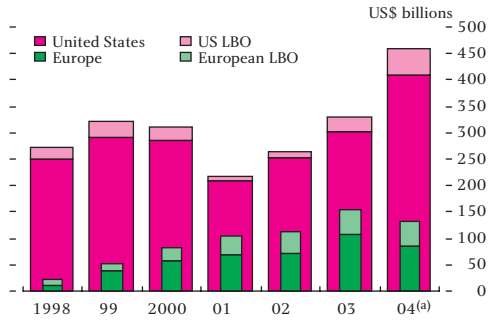
Sources: Moody's Investors Service, Thomson SDC Platinum and Bank calculations.

(a) S&P ratings at launch.

(b) Twelve-month issuer-weighted speculative-grade default rate.

(c) Proportion of B- and below rated US domestic bond issues out of total sub-investment-grade issues.

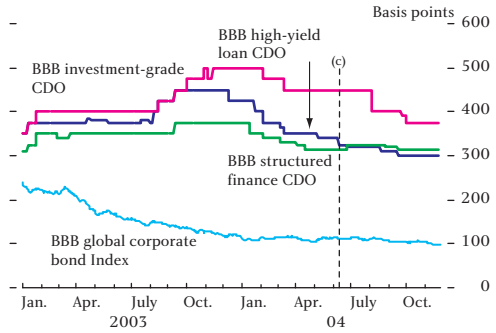
Chart 2.18
Leveraged loan issuance



Sources: Loan Pricing Corporation and Bank calculations.

(a) 2004 data are annualised based on 2004 Q1-Q3 data.

Chart 2.19
Structured credit spreads[(a)] versus bond yield spreads[(b)]



Sources: JP Morgan Chase & Co. and Merrill Lynch.

(a) Spreads over Libor on BBB-rated tranches of collateralised debt obligations (CDOs) with a variety of underlying assets.

(b) Spreads over swaps for BBB-rated corporate bonds (CDS premia generally trade higher than bond or loan spreads).

(c) June 2004 *Review*.

The structured credit markets have, indeed, made it possible for more investors to diversify and leverage credit portfolios – in other words, some previously missing markets now exist. Recently, the renewed compression in corporate bond spreads has spurred greater and more complex use of leverage – for example, so-called CDO-squared (and, more recently, CDO-cubed) – as dealers seek to assemble tranches of portfolios that meet investors' return, risk and credit rating criteria while also yielding expected profits for the arrangers (Chart 2.19). But the 'search for yield' may well have driven spread compression too far. For example, some of the largest declines in credit spreads this year have been in companies with wide credit spreads given their credit rating. In addition to the influence of economic fundamentals, declines in the spreads of these companies are said, by many practitioners, also to reflect their inclusion in structured credit portfolios. This is because their relatively wide spreads allow the arranger to increase yields without affecting the ratings of the tranches.

When dealers arrange tranches of credit portfolios for investors, the investor effectively sells credit protection, leaving the intermediary with an unhedged position where they have effectively bought protection. Dealers typically aim to (delta) hedge by selling sufficient protection – in the single-name credit default swap (CDS) market, or using the DJ iTraxx credit indices – to offset their exposure to movements in credit spreads. If the tranches are leveraged, the size of the hedge will be a multiple of the tranche size. Market contacts say that the scale of these hedging flows has put downward pressure on CDS premia, which at times have fallen below the spread over Libor on an issuer's bonds. In this way, investor demand for portfolio tranches feeds through into narrower spreads on corporate bonds. Until the markets become fully liquid and efficient, it is possible that this could occasionally drive a wedge between fundamentals and market prices.

The distinguishing features of the commodity, EME and structured credit markets described above have been strong increases in participation by financial intermediaries and end-investors; relatively strong recent returns; and relative illiquidity. While developments in these markets may be warranted by fundamentals in each case, it is possible that they may also be characterised by a degree of exuberance. If so, they may be a component of a gradual overaccumulation of exposures brought about by any material mispricing of risk; or they may be vulnerable to a nearer-term adjustment which, in the presence of leverage, could potentially be quite abrupt.

2.2 Hedge funds and leverage

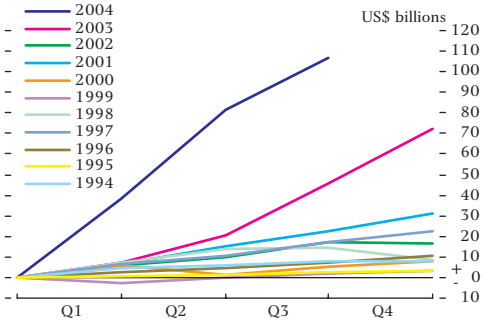
Inflows into hedge funds have continued at record levels, despite the relatively modest returns of many strategies recently (Chart 2.20 and Chart 2.21). Low volatility and an absence of directional trends in many major markets for much of the year have contributed to an environment which many funds have found difficult. To generate returns, as described above, some have been increasing their involvement in less efficient markets, where mispricing – and so positive risk-adjusted returns – may conceivably be more likely. This has been especially marked in credit markets, where hedge funds have become more active in lending (for example second-lien tranches of syndicated loans) and distressed debt as well as CDO tranches. Consistent with this, some hedge funds have moved into private-equity-like strategies; and some private equity firms have set up hedge funds. In a separate development, it seems that a few hedge funds have now established vehicles to write catastrophe reinsurance. To some extent, such strategies obtain a return for illiquidity.

As previous *Reviews* have noted, a combination of leverage, relatively illiquid assets and, in many cases, model-based approaches to trading and valuation may, in the event of material asset price shifts, exacerbate stressed conditions. In such circumstances, much would depend on the maturity structure of funds' liabilities. Evidence here is mixed. A number of the largest and most high-profile funds appear to have succeeded in lengthening – or maintaining – the lock-ins they are able to impose on their investors. Others (perhaps particularly those reliant on investments by funds of hedge funds) appear still to offer their investors monthly, or quarterly, liquidity – and are thus potentially more at risk of sharp withdrawals of funds in the event of a change in sentiment. Some intermediaries may offer more frequent liquidity to clients who invest in hedge-fund-linked products.

Previous *Reviews* have highlighted the difficulty in measuring leverage in the hedge fund sector. In part this is because of the absence of directly observable measures. But it is also because leverage can take many different forms: individual investors and funds of funds may be leveraged, as well as the funds themselves; and hedge funds may have 'economic leverage', via derivatives or via assets that themselves embody leverage.[1] Crude proxies for funded leverage, for example lending to the Cayman Islands, where many funds are domiciled, have continued to show strong increases (Chart 2.22). Notwithstanding public reports of significant trading losses at individual large funds, market contacts have suggested that, taken as a whole, the fund sector is

(1) As discussed most recently in 'Box 5: Hedge fund industry leverage' in the June 2004 *Review*, page 53.

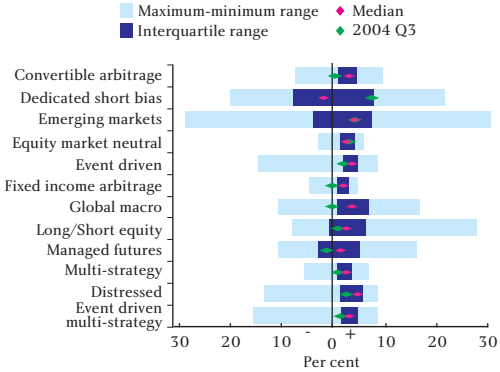
Chart 2.20
Cumulative flows of capital into hedge funds[a]



Source: TASS Research.

(a) Figures are based on the TASS hedge fund database, which currently contains 3,023 reporting and 2,036 non-reporting funds.

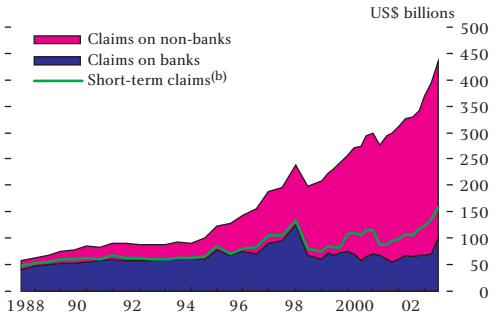
Chart 2.21
Performance of hedge fund strategies[a]



Sources: TASS Research, Bloomberg and Bank calculations.

(a) Using data for 1994 Q1 to 2004 Q3.

Chart 2.22
Bank lending to entities domiciled in the Cayman Islands[a]

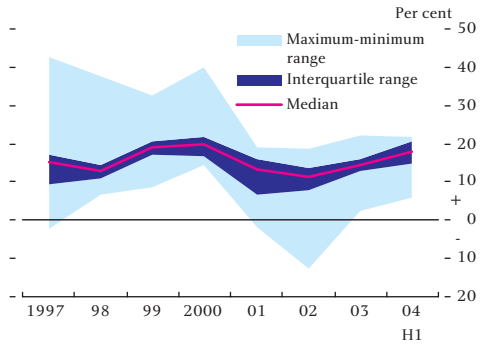


Source: Bank for International Settlements.

(a) Consolidated claims of BIS-reporting banks on the Cayman Islands.

(b) Claims with maturity of up to one year.

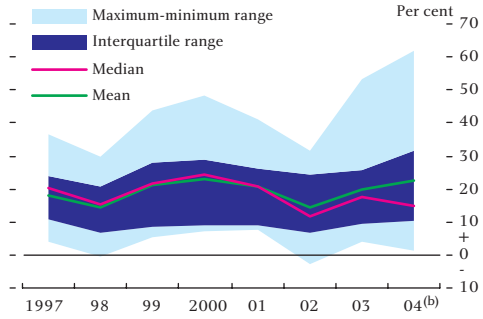
Chart 2.23
Return on equity for LCFIs[a]



Sources: Earnings releases and Bank calculations.

(a) Net income divided by average shareholders' equity, annualised for 2004 H1.

Chart 2.24
Proportion of net revenues attributable to trading for LCFIs[a]

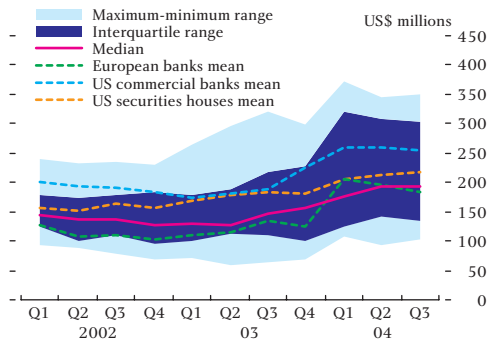


Sources: Earnings releases and Bank calculations.

(a) Net trading revenues as a proportion of total net revenues.

(b) 2004 data annualised from 2004 H1 or 2004 Q1 and Q2 data, contingent are LCFI reporting convention.

Chart 2.25
Trading book market risk for LCFIs[a][b]



Sources: Regulatory filings, earnings releases and Bank calculations.

(a) Average value-at-risk adjusted to a ten-day holding period, 99% confidence interval and US$, as necessary.

(b) For LCFIs reporting quarterly value-at-risk, thus excluding one European bank and both UK banks.

not as leveraged as in 1998. Nevertheless, given strong growth and the apparent increase in 'economic leverage', it seems plausible to believe that potential leverage in the hedge fund sector may have been increasing in recent years. An important question is therefore whether investor expectations of hedge fund returns are moderating in line with the greater efficiency in markets potentially resulting from increased hedge fund activity and investment bank product innovation.

2.3 Major financial institutions

Large complex financial institutions

The large complex financial institutions (LCFIs)[1] as a whole continue to be financially strong, although a number of challenges have become more apparent since the June 2004 *Review*. In aggregate, the group continues to be highly profitable (Chart 2.23). Judging from market-based indicators, there has been a moderate reduction in concern over both creditworthiness and profitability. The price of protection against an LCFI default has fallen since the previous *Review*.

Profitability has varied significantly across business lines. Traditional activities such as investment banking, particularly for the US LCFIs, have been subdued until recently. In part this reflects conditions in primary financial markets, most notably mergers and acquisitions, and initial public offerings of equity. To maintain high profitability in aggregate, the LCFIs have relied on revenues from trading activities (Chart 2.24). More recently, markets that have traded in tight ranges, and low and falling volatility, have been reflected in lower trading revenues. In response, LCFIs in aggregate have increased their exposure to market risk (Chart 2.25), as measured by value-at-risk (VaR).[2] Some, however, reduced their VaR. But a fall in VaR does not necessarily indicate a reduction in the size of trading positions; it could simply be a mechanical effect of lower historical volatility being reflected in updates of the data sets that are used in many market risk systems.

The LCFIs face a number of challenges. First, as recent experience has emphasised, there is a risk of regulatory investigations and litigation. As well as direct costs such as legal expenses (Chart 2.26) and the absorption of senior management's time, there can be reputational consequences. Questions have been posed about the challenges inherent in

(1) The December 2001 *Review* page 81 described the criteria used to determine an LCFI peer group. It comprises: ABN Amro, Bank of America, Barclays, BNP Paribas, Citigroup, Credit Suisse, Deutsche Bank, Goldman Sachs, HSBC, JP Morgan Chase & Co, Lehman Brothers, Merrill Lynch, Morgan Stanley, Société Générale and UBS.

(2) VaR is an aggregate measure of downside risk, defined as the maximum loss over a target horizon such that there is a low, pre-specified probability that the actual loss will be larger. See Jorion, P (2002), 'Fallacies about the effects of market risk management systems', Bank of England *Financial Stability Review*, December.

managing such large and complex institutions, and about how to balance the influence of the various different dimensions of matrix-management structures.

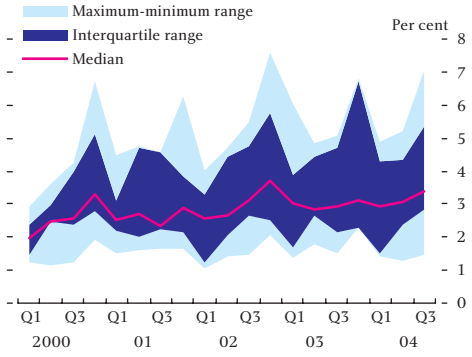
These risks are not confined to the banking sector but can extend to some of the LCFIs' most important counterparties, including two of the US Government Sponsored Enterprises (GSEs), Freddie Mac and Fannie Mae, and some global insurers. As noted above, the recent marked widening for a brief period of some insurance companies' CDS premia illustrated the effect that regulatory and judicial investigations can have on their perceived credit standing. For some, who are active as risk-taking intermediaries in global capital markets, maintaining a very high credit rating is intrinsic to their business model.

Second, the rapid growth in structured credit markets has brought challenges. Dealers' back offices seem to have struggled to keep pace with front offices, with backlogs of unconfirmed trades. There are questions about the models used, which have known limitations and are untested in stressed market conditions. More generally, it is unclear to what extent these new markets would remain liquid in a less benign credit or trading environment. On the one hand, active two-way markets with a wide range of participants now exist in most investment-grade single name CDSs and in the standardised CDS indices and index tranches. Dealers are planning regular price fixings in these instruments to provide greater transparency, including reference prices for more complex derivatives. And arbitrage between the portfolio and single-name credit markets, and between CDS, bond and loan markets, should help to underpin liquidity throughout the credit markets – for example, dealers could quickly move to exploit any misalignment between CDS premia and required returns on CDO tranches by structuring synthetic CDOs. On the other hand, the markets remain untested in the face of a sharp widening of credit spreads or a sharp increase in default correlation. The rapid growth of the structured credit markets, the narrowing of credit spreads and the wider 'search for yield' have drawn in many new participants during a period when modelling and operational infrastructure are still developing. It is unclear how they would respond in stressed market conditions.

Finally, LCFIs continue to adapt business models as competition reduces risk-adjusted returns in some markets. In some products, firms compete primarily to gain market share and league table ranking. For some while now, this has been most obvious in equity market block trades, often undertaken at narrow discounts, as highlighted in previous *Reviews*.[1] As time passes, this seems to be part of a broader pattern of equity market intermediation involving more risk taking, making it slightly

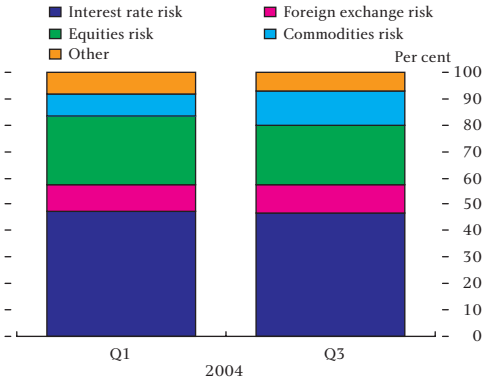
(1) See the December 2003 *Review*, page 29.

Chart 2.26
Professional fees paid by US LCFIs as a percentage of net revenues[a][b]



Sources: Company reports and Bank calculations.
(a) Professional fees used as a proxy for legal expenses.
(b) Data for five of the seven US LCFIs due to disclosure.

Chart 2.27
Trading book market risk for LCFIs[a][b], proportions by market risk category

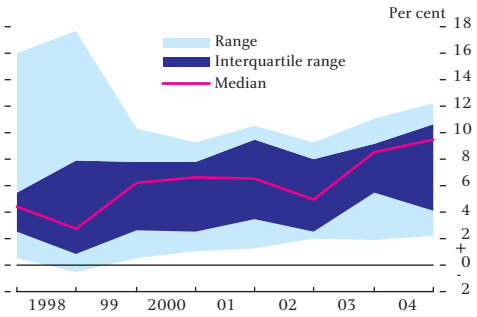


Sources: Regulatory filings, earnings releases and Bank calculations.

(a) Average value at risk adjusted to ten-day holding period and 99% confidence interval.

(b) For LCFIs reporting quarterly value-at-risk, thus excluding one European bank and both UK banks.

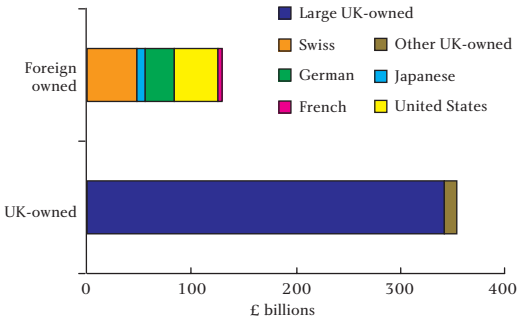
Chart 2.28
Large UK-owned banks' dealing income as a percentage of operating income[a]



Sources: Published accounts and Bank calculations.

(a) Includes seven of the ten largest UK-owned banks.

Chart 2.29
UK-resident banks' participation in the unsecured interbank market, September 2004[a][b]



Source: Bank of England.

(a) Lending in all currencies. Includes unsecured loans and holdings of CD and CP issued by other UK-resident banks.

(b) Unconsolidated data that include intra-group transactions.

more like fixed-income market intermediation. The range of markets covered by LCFIs generally has also been broadening. Notably, a number of LCFIs are increasing their involvement in commodity markets, either through adjustment of the composition of their trading risk (Chart 2.27) or through the purchase of commodity trading operations.

Perhaps the most significant developments, under way for a while now, centre around the servicing of hedge funds. In particular, competition to provide prime brokerage services has intensified (Box 6). Some LCFIs have taken further steps into the hedge fund sector, for example through the outright purchase of funds. Such acquisitions, together with a more explicit focus on in-house hedge funds at some LCFIs, may simply be an extension of their asset management business and so bring further revenue diversification. But experience suggests that to avoid costly mis-steps, acquisitions and expansion needs to be in line with long-term business strategy, and that appropriate risk management and controls need to be put in place and maintained.

2.4 Implications for the UK financial system

Large UK-owned banks too are active in the international financial markets discussed above, through their trading, funding, underwriting, and investment activities. Indeed, in the past three years some UK banks have increased their market activities as reflected in global league tables (especially bonds, syndicated loans, and foreign exchange). Although volatile, dealing profits of large UK-owned banks have also grown noticeably as a proportion of total income (Chart 2.28). This could be interpreted as another indication of greater financial market involvement.[1]

Counterparty credit risk

UK banks have significant counterparty exposures to foreign-owned financial institutions, including the LCFIs discussed above. Around a fifth of large UK-owned banks' foreign on-balance-sheet claims are international claims against foreign banking sectors.[2] Foreign-owned banks are also significant participants in the London unsecured interbank market (Chart 2.29), although the size of this participation has not changed materially since the June 2004 *Review*.

(1) Dealing profits should, however, be interpreted with some caution. Some banks, for example, include the net interest income earned on the dealing book as dealing income. Net interest income on the dealing book can be influenced by factors other than short-term financial market activity. For example, if the yield curve is upward sloping and dealing positions are being funded at the short end of the yield curve, this will provide positive net interest income to dealing income.

(2) See 'Box 2: UK-owned banks' international exposures' in the June 2004 *Review*, page 28.

Box 6: Prime brokerage

As noted on pages 58–60, one of the challenges facing LCFIs is to continue to adapt their business models as risk-adjusted returns are apparently declining in some markets. For many, this has included placing increased empasis on servicing hedge funds. Competition among major banks and securities houses for prime brokerage mandates remains strong. Prime brokerage in this context is a portmanteau term for a range of hedge fund services that may comprise many or all of: extension of (mainly secured) credit; securities lending; trade executions; cash management; clearing and settlement; custody; reporting, accounting and other fund administration services; technology platforms; and capital introduction (introducing potential investors to hedge fund managers).[1] The core of the prime brokerage relationship is financing of hedge funds' positions and clearing and settlement of their trades.

Three broad categories of prime brokerage can be identified, although there is some overlap between them and delineations may not in practice be clear-cut:

- *Equity prime brokerage*, sometimes referred to as *'traditional' prime brokerage*, comprises, for the most part, secured financing of long equity positions, securities lending to cover short positions and associated custody services.

- *Synthetic prime brokerage* is a more recent development and typically involves enabling hedge funds to take positions using contracts for differences or total return swaps. The funds might otherwise have taken these positions by buying or selling short the underlying securities. The broker may hedge its resulting positions by trading in the underlying securities, or finding offsetting positions in the rest of its book. For new entrants to the industry, this may be part of a strategy to become an additional prime broker to the fund's main broker: this way, they can get funds' business without offering administrative and ancillary services.

- *Fixed-income prime brokerage* is targeted at macro and relative value fixed-income funds. It combines elements of the two categories above, and involves providing a service covering some or all of bonds, repo, over-the-counter derivatives (such as swaps), foreign exchange and futures clearing. The exchange-traded derivatives and over-the-counter derivatives aspects of both fixed-income and traditional prime brokerage are sometimes referred to as *derivatives prime brokerage*. As part of this service, the prime broker may clear over-the-counter derivatives with other dealers by interposing itself between the fund and the dealer; that way, the prime broker has the potential counterparty exposure to the dealer.

Challenges for prime brokers

Risk management by prime brokers is generally thought to have improved in the past few years and many hedge funds – particularly among the largest – have themselves been increasing their own risk management capabilities. Market contacts, both in major banks and securities houses and in hedge funds, have suggested that there is a general determination in the industry 'not to repeat the 1998 experience'. Nevertheless, and particularly in the context of competition among prime brokers, a number of challenges remain.

Concerns have been expressed that competition is resulting in initial margin requirements (applied by prime brokers to hedge funds' positions) being relaxed. This is perhaps especially the case in synthetic and fixed-income prime brokerage, where much of the value comes from selling derivatives to hedge funds . The challenge for prime brokers is therefore to maintain an appropriate balance between the interests of the firms' trading desks and those of prudent credit control.

Prime brokers need to assure themselves that they have sufficient scope to ensure that their margin requirements are adequate in changing circumstances. Some prime brokers have reported pressure from hedge funds to give a commitment that margin terms will remain constant for a defined period, or to relinquish so-called 'termination events' that allow the prime broker to demand repayment of borrowing if the net asset value of the fund falls below

(1) See 'Box 5: Prime brokerage' in the June 2004 *Review*, page 56.

a certain trigger level – provided the hedge fund continues to meet its obligations to the prime broker in that period. From the point of view of the funds, the motivation is to help them manage their liquidity risks, especially in stressed circumstances. But prime brokers need to weigh that against their own need for flexibility to provide themselves with an adequate margin cushion in circumstances when market volatility increases.

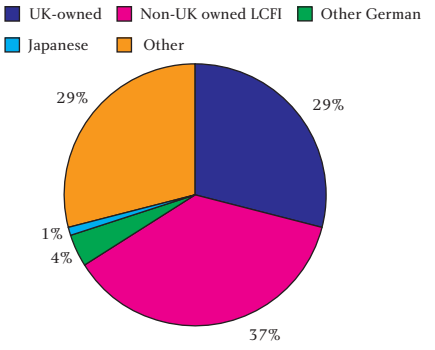
As prime brokers expand the range of instruments in which they can provide a service, so the number of positions across which they can offer margin offsets, based on past covariances in the positions (so-called VaR-based margining) increases. While the motivation for this is based on prudent risk management principles, prime brokers will need to be sure that the terms they apply reflect their potential exposures in stressed conditions; and that their ability to net their exposures to funds in the event of default, potentially across different legal jurisdictions, is enforceable.

A related point, noted in the June 2004 *Review*, is that many funds – particularly the larger – have a number of prime brokers. From the funds' perspective, this is a prudent attempt to diversify their sources of liquidity. But individual prime brokers need to consider the implications for them of hedge funds having multiple prime brokers, and their risk management approach where they lack a comprehensive picture of a fund's overall leverage and any concentration of its positions.

As discussed in the main text, hedge funds are said to be increasingly involved in less liquid and more 'exotic' markets, where positions may be taken in bespoke structured derivative instruments or in illiquid securities or loans, such as distressed debt. Prime brokers need to judge on what terms to provide financing for these positions. Considerations include whether the fund's leverage and the quality of its capital (for example the lock-in arrangements that apply to investors) are appropriate given the illiquidity of its assets.

These less liquid markets tend to be relatively specialised, and there may only be a small number of banks and securities houses actively participating and so providing liquidity. In this context, a few banks and dealers are conducting 'major player exit' stress tests to try to calibrate the effects on their positions – including exposures within their prime broker operation – of another bank or dealer (or large hedge fund) leaving particular markets. Other banks and securities houses may wish to consider, and similarly attempt to model, their own exposures in this context.

Chart 2.30
Large UK-owned banks' 'large exposures' to financial firms, September 2004



Sources: Bank of England and FSA regulatory returns.

Regulatory 'large exposures' returns submitted to the FSA[1] capture both on-balance-sheet and off-balance-sheet instruments. They show that large UK-owned banks have material counterparty exposures to LCFIs, investment banks, and other internationally active financial institutions. Furthermore, collectively these exposures are of the same order of magnitude as their exposures to other large UK-owned banks (Chart 2.30). Exposures to Japanese and German financial firms (excluding LCFIs) are more modest.

UK banks' wholesale market activities also result in counterparty exposures to non-financial companies. One channel is through UK banks' increasing share of syndicated lending (Chart 2.31), which is predominantly to non-financial firms. Another channel is via their role as sponsors in the asset-backed commercial paper (ABCP) market, where their participation has grown

(1) For regulatory purposes, 'large exposures' are defined as the largest twenty exposures equal to or under one-year maturity that are both larger than £250 million in size and over 5% of the Large Exposures Capital Base (LECB), plus any other longer-term exposures that equal or exceed 10% of LECB. LECB is defined as Tier 1 capital plus Tier 2 capital less any regulatory deductions.

significantly in recent years. In both cases, however, the ultimate risk to UK banks will depend on the extent to which exposures have been hedged or sold on, which is difficult to assess.

Market and liquidity risk

Some UK banks allocate a material proportion of their economic capital to cover market risk (although less than that allocated to credit risk). Market risks are typically classified as being in the 'trading' or 'banking' book, an accounting distinction also used by banking regulators.

The trading book

The largest UK-owned banks all disclose market risk in the trading book using a value-at-risk (VaR) method. Interest rate (or yield curve) risk continues to make up the majority of their VaR, with the rest consisting mostly of foreign exchange and equity risk. Average VaR as a percentage of quarterly earnings was little changed for UK banks in the six months to 2004 H1, following falls during 2003. VaR remains low for most UK banks when compared with US and European LCFIs (Chart 2.32).

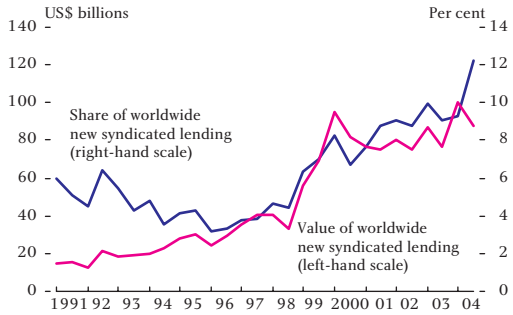
However, it is well recognised that standard measures of VaR should be interpreted with some caution. They provide no information on the nature of potential losses beyond the reported confidence threshold, and for trading positions in particularly illiquid markets (such as distressed debt, high-yield credit and Mergers and Acquisitions (M&A) arbitrage strategies) the assumed holding period may not provide a sufficient time to liquidate positions. To address these types of issues, in their internal risk management banks tend to use a range of different VaR assumptions, and supplement VaR analysis with both stress tests and scenario analysis of market prices and market liquidity.

The banking book

Although increasing marginally, large UK-owned banks' trading books still make up the minority of total assets (Chart 2.33). But UK banks also take market risk in their banking books, to the extent that they run mismatches between the maturities and interest rate terms of their deposits and lending.

Disclosure of market risk in the banking books of UK banks is made according to Financial Reporting Standard 13 (FRS13), which requires that net liabilities open to repricing at different maturities are reported. However, as discussed in the June 2004 *Review*, this measure has a number of pitfalls, including a focus on contractual rather than behavioural maturities (which may differ because of factors such as mortgage prepayment and current accounts not being repriced regularly). Reflecting such weaknesses, for internal purposes UK banks use a number of alternative methods of measuring market risk in the banking book, including VaR, stress testing and scenario analysis. Implementation of Basel II may result in further improvement in

Chart 2.31
Large UK-owned banks' share of new worldwide syndicated lending[(a)(b)]

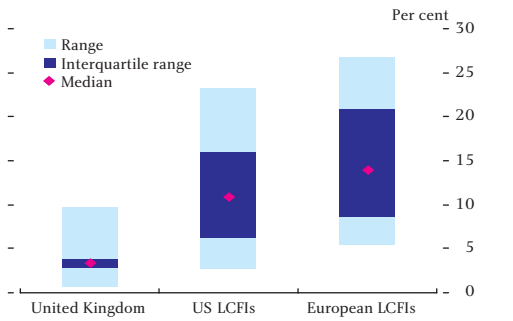


Source: Dealogic.

(a) Includes cancelled loans, but excludes amendment and unsigned loans.

(b) Where the actual proportions provided by each syndicate member are unknown, loan amounts have been split equally amongst participating banks.

Chart 2.32
Average trading VaR as a percentage of average quarterly operating income, as at end 2003[(a)(b)(c)]



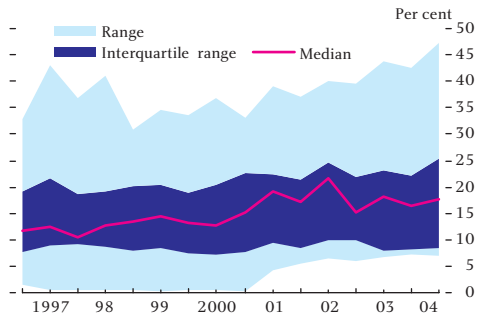
Sources: Published accounts and Bank calculations.

(a) Published VaRs have been adjusted to a ten-day holding period and a 99% confidence interval. This assumes independent and normally distributed returns.

(b) Average quarterly income is calculated from annual income.

(c) Data for six UK-owned banks, seven US LCFIs and six European LCFIs.

Chart 2.33
Large UK-owned banks' trading book assets relative to total assets[a][b]



Sources: Bank of England and FSA regulatory returns.

(a) Includes data for banking groups' subsidiaries prior to merger or acquisition.

(b) Includes seven of the ten largest UK-owned banks.

market risk measurement and better disclosure. What publicly available data there are suggest that VaR in the banking book is larger than in the trading book for many large UK-owned banks. Nevertheless, despite the yield curve flattening since the June 2004 *Review*, UK banks have not reported material losses to the banking book.