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## **Financial Stability Review**

June 2000

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## The **Financial Stability Review** aims:

- to encourage informed debate on financial stability issues, domestically and internationally
- to survey potential risks to financial stability
- to analyse ways of promoting and maintaining a stable financial system

### Essential information

The Bank of England website <http://www.bankofengland.co.uk/fsr/> has additional information about the *Financial Stability Review*. (The website also has details of job opportunities at the Bank of England at <http://www.bankofengland.co.uk/employment/>)

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This document was delivered to the printers on 21 June 2000 and, unless otherwise stated, uses data available as at 9 June 2000.



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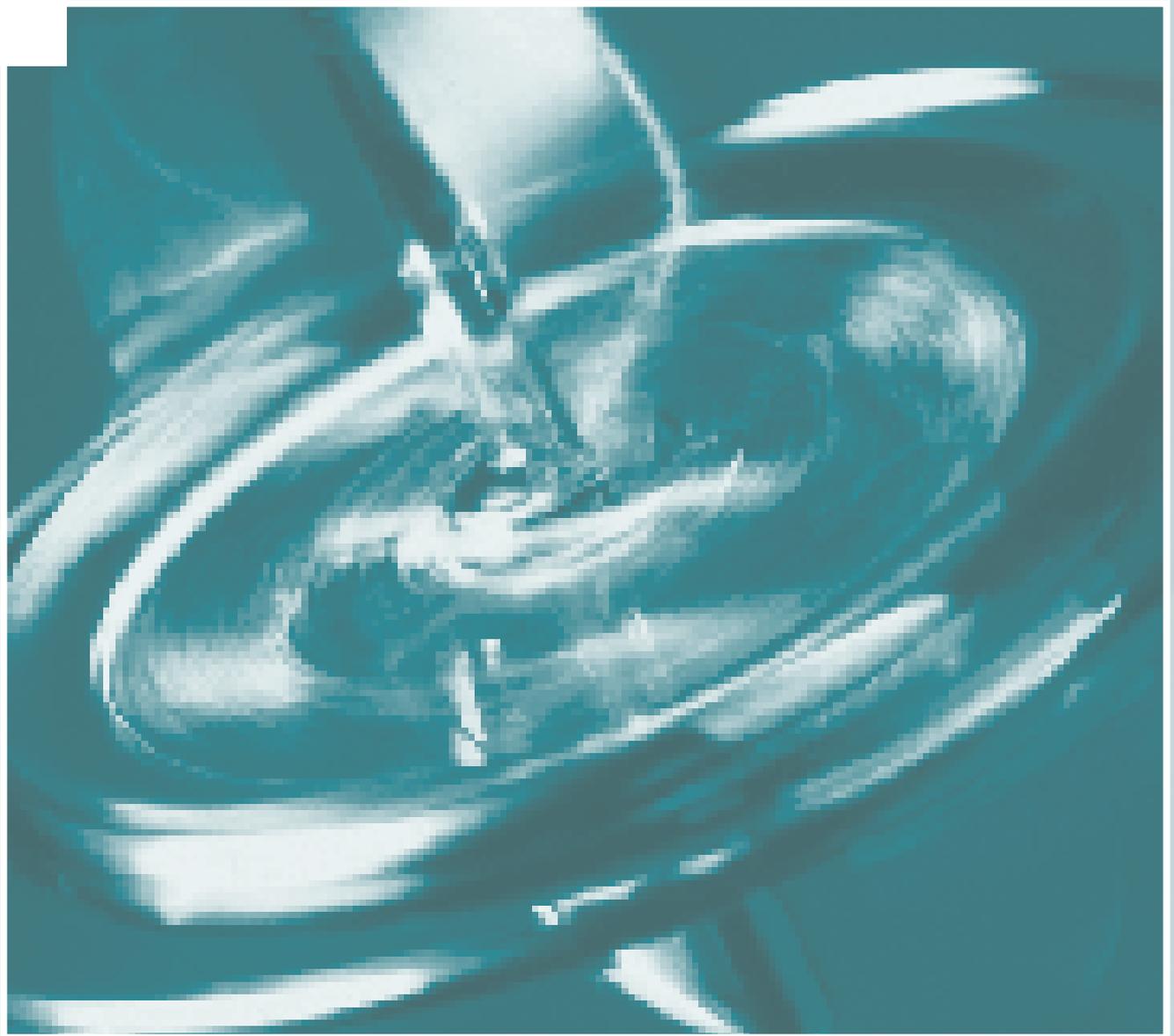
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# The financial stability conjuncture and outlook

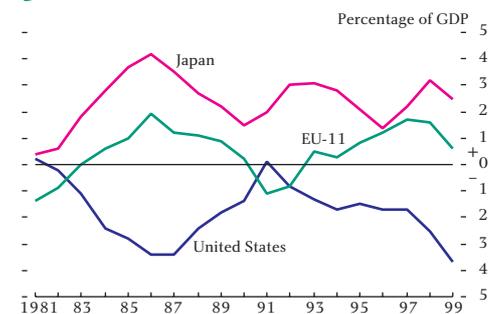
## Overview: risks to financial stability

This is the latest half-yearly review of risks to financial stability published by the Bank of England. Its scope is wide, reflecting London's position as an international financial centre, through which major disturbances more or less anywhere in the world can echo. On balance, the Bank's assessment is that risks have decreased somewhat over the past six months or so, as they had over the previous six. In particular, there has been some welcome correction in exchange rates, in high-tech equity prices, and also to a lesser extent in wider equity indices. But perceptible risks do remain. Those which the Bank sees as most important from a United Kingdom perspective are described here. The emphasis throughout is on downside risks rather than on the central (or most likely) outlook, given that the aim is to identify potential sources of systemic disruption.

### Global economic imbalances, the USA, and global financial markets

One of the most significant global risks stems from continuing current account imbalances (Chart A), and the associated accumulation of US private sector and external debt. With evidence of stronger growth in Europe and Japan (Chart B), the likely impact of higher US interest rates on domestic demand and the recent pick-up of the euro against the dollar, the risks from this source have probably moderated somewhat since the Bank's November *Review*. But the US current account deficit recently reached record levels, household debt remains high and many companies have been increasing their leverage. This may well be benign – increasing external and corporate debt may be the counterpart of investment to capture the benefits of improved productivity growth, with household debt growing in the expectation of higher future incomes. Even if the imbalances are unsustainable, the adjustment may be smooth. But that cannot be guaranteed. Triggers for a sharper adjustment could include higher than expected interest rates if aggregate demand outstrips the economy's supply capacity to the point of putting strong upward pressure on prices and earnings; or any news which prompted downward revisions of expected future productivity growth. Particularly if the latter were to occur, savings behaviour and asset prices, including exchange rates, could alter abruptly, as debts would have been accumulated on the basis of what turned out to be mistaken expectations about long-run incomes. These risks are, of course, well understood by the US authorities.

**Chart A:**  
**G3 current accounts**



Source: OECD Economic Outlook, June 2000.

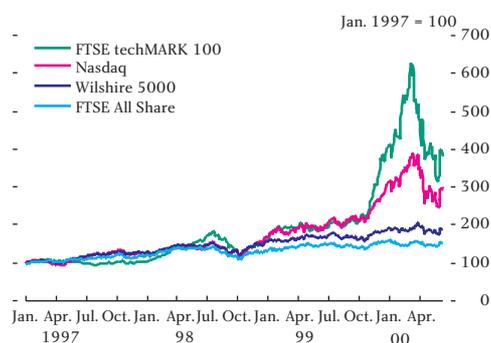
**Chart B:**  
**Consensus<sup>(a)</sup> growth rates for 2000**



Source: Consensus Economics.

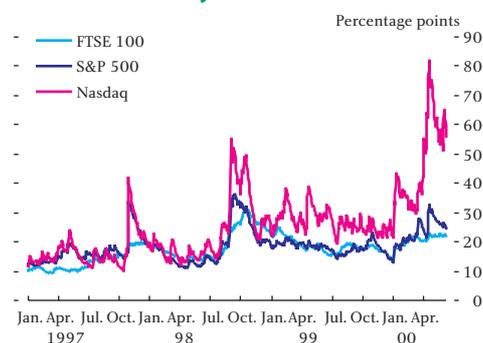
(a) Mean of forecasts compiled by Consensus Economics.

**Chart C:**  
**Equity indices in the United Kingdom and United States**



Source: Primark Datastream.

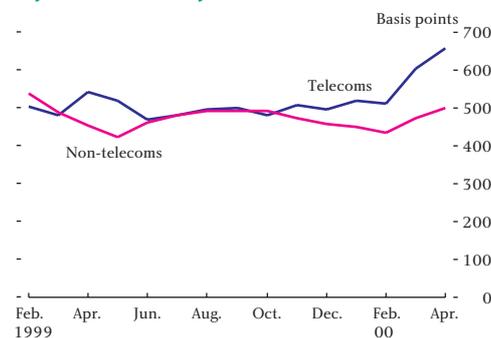
**Chart D:**  
**Historical volatility of share indices<sup>(a)</sup>**



Sources: Primark Datastream and Bank of England.

(a) Volatility calculated as annualised 252-day rolling exponentially-weighted moving average of squared daily log returns.

**Chart E:**  
**Euro-denominated sub-investment grade corporate bond spreads<sup>(a)</sup>**



Source: Lehman Brothers.

(a) Option-adjusted spreads between corporate and government bonds.

It is equally important that they are taken into account by borrowers and, perhaps especially, by banks and other lenders.

The uncertainty confronting borrowers and lenders is increased by the scale of structural change in the US economy and, to a lesser extent, elsewhere. That is one element underlying a second global risk: from the level and volatility of equity markets – especially ‘new economy’ stocks (Charts C and D). So far, there have been no material spillovers. In the face of some quite sharp falls, triggering margin calls, the myriad credit interlinkages which characterise modern financial markets have remained intact. In addition, first the expectation, and then the implementation, of tightening in US monetary policy were smoothly absorbed by the system as a whole. A degree of comfort can probably be taken from that, and from there having been some welcome correction in the level of equity market prices, particularly in high-tech stocks which had become ‘frothy’ in the spring but are now off their highs (the FTSE techMARK by around 40 per cent). But continued uncertainty in the wider economic environment and persistent volatility in markets underline the importance of rigorous risk management being maintained in financial firms.

Some particular points meriting assessment are as follows.

First and perhaps most obviously, notwithstanding the recent correction, equity markets in general, and high tech stocks in particular, continue to be highly valued on conventional measures. Market comment suggests that many intermediaries are hedged against changes in the level of equity prices generally. There is, though, a risk that investor behaviour is being unduly influenced by a perception that the high returns of recent years will persist. If a fall in the equity risk premium is a material part of the explanation for the substantial rise in the market as a whole over recent years, that perception could well prove misplaced. Such a fall would lead to a rise in the *level* of the market and would thus temporarily raise *ex post* returns, but it would mean that continuing expected rates of return were lower, other things being equal.

Second, there has been a rise in the price of credit for riskier borrowers over the past few months, perhaps most noticeably in the sub-investment grade telecommunications sector (Chart E), partly reflecting the massive demand for funds to finance investment programmes. Whether concentrated exposures to telecoms are developing in the United States and Europe may warrant monitoring by prudential supervisors as well as by risk managers.

Third, credit market spreads, and fixed-income market prices more generally, have themselves been volatile (Chart F), reflecting reduced capital committed to trading and reductions

in the current and prospective supply of government bonds. That has complicated hedging strategies (see Box 4 in Section III). In the United Kingdom, given the distortions to the long end of the gilt yield curve, any revisions to the Minimum Funding Requirement regulations applying to pension funds would need to be aired and introduced in a way which minimises the risk of exacerbating volatility in the short run.

Reduced US government bond supply has led the market to explore other possible dollar benchmark assets. In addition to swap rates, candidates have included Fannie Mae, Freddie Mac and Federal Home Loan Bank securities; but at present there appears to be a divergence between their formal status (that they are not guaranteed by the US government) and the way they are perceived by the market. Given the scale of US bank holdings of these bonds and the agencies' very large presence in dollar swap markets, it is important that perceptions should be accurate. Some adjustment in credit spreads has already occurred, following testimony to Congress by US Under Secretary Gensler.

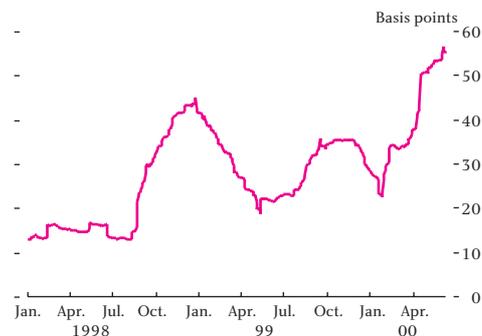
### Other overseas risks

On a positive note, there has been a sharp turnaround in the Japanese corporate sector's financial position, as firms' cash flows have improved and they have sought to repair earlier damage to balance sheets. Aggregate demand has been sustained over the past few years by fiscal policies; and projections of government debt (Chart G) suggest that there could be future constraints on government fiscal policy and specifically on the scope to implement further financial bail-outs should that prove necessary. That may not matter as much as in the recent past given the improved outlook for growth and signs of strengthening private sector demand; but parts of the financial and corporate sectors remain financially fragile, creating risks if macroeconomic expectations are not realised. It is, in any event, important that the restructuring of the deposit guarantee and safety net arrangements, now scheduled for April 2002, should be implemented smoothly as a step towards addressing the moral hazard problems created by recent state rescues and guarantees.

There are no obvious material risks to financial stability from macroeconomic conditions in the euro area as a whole, other than perhaps from the possibility of exchange rate volatility. Some small euro-area economies, most obviously Ireland, do however seem to be overheating, with strong credit growth and rapidly rising property as well as equity prices (Chart H). Whether that could create risks to stability outside the countries concerned depends partly on links between financial sectors, which need to be monitored by regulatory and other financial stability authorities.

Risks to global stability, and to the United Kingdom, from emerging market economies (EMEs) remain much smaller than

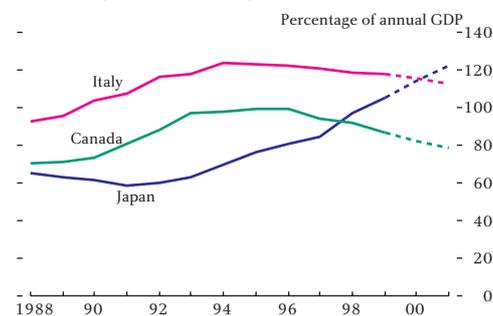
**Chart F:**  
US dollar swap spread volatility<sup>(a)</sup>



Source: Reuters.

(a) Volatility calculated as 91-day annualised standard deviation of daily swap spread changes.

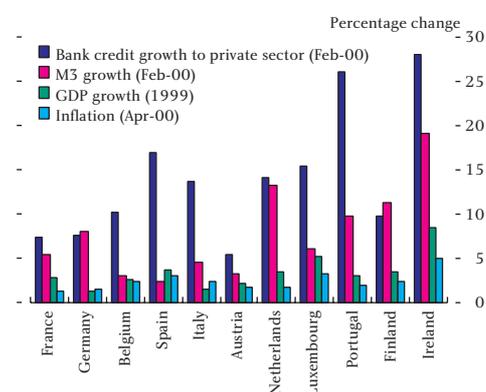
**Chart G:**  
General government gross debt<sup>(a)</sup>



Source: OECD Economic Outlook, December 1999.

(a) 2000-2001 observations are OECD forecasts.

**Chart H:**  
Asymmetric developments in the euro area<sup>(a)(b)</sup>



Sources: Eurostat, IMF and national central banks.

(a) Luxembourg M3 data are for January 2000.

(b) Luxembourg, Portugal and Ireland GDP growth data are IMF projections.

**Table A: Short-term external debt as a percentage of official foreign exchange reserves<sup>(a)</sup>**

Per cent	end-1996	end-1999
Argentina	139.3	134.4
Brazil	73.4	97.5
Mexico	138.2	73.9
Russia	235.2	129.1
Turkey	70.1	92.1
S Korea	198.3	47.5
Thailand	121.1	41.8

Sources: IMF and joint BIS-IMF-OECD-World database.

(a) Short-term debt is defined as residual short-term consolidated liabilities to banks.

during 1997–98. Growth forecasts for EMEs have generally been revised upwards, and prospects for private capital flows have generally improved, although credit spreads have risen recently, partly reflecting equity market volatility and higher US interest rates. A ‘hard landing’ in the USA would be likely to have knock-on effects. In addition, local pockets of risk remain.

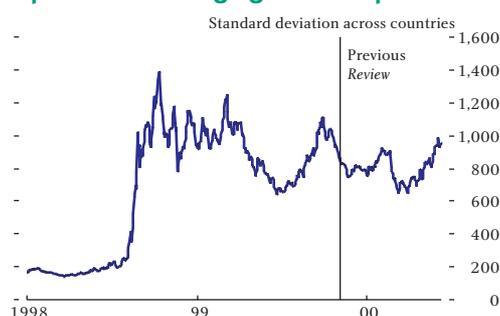
Foreign-currency financing requirements are still large in Latin America; and some countries – for example, Argentina and Brazil as well as Turkey – have to roll over large amounts of short-term debt (Table A). Although there has been some progress in reforming banking and corporate sectors in Asia, the pace seems to have slackened in some countries and much remains to be done by some if structural vulnerabilities are not to re-emerge in the future. Bond market spreads – and so implied private sector risk perceptions – remain much higher than before the 1997–1998 crises, but there is much greater differentiation between risks (Chart I). This offers a degree of reassurance that contagion may be limited in the event of individual country problems.

Continuing vulnerabilities amongst EMEs have a direct bearing on some key policy initiatives. One central lesson of recent crises, especially in those EMEs where access to deep wholesale money markets is not assured, is that liquidity needs to be placed alongside capital adequacy as a key plank of a stable banking system. The Basel Committee on Banking Supervision’s recently revised guidelines on liquidity management are, therefore, a useful and timely reminder of the importance of this issue (Box 8 in Section VI). More work is needed, nationally and in the IMF, on surveillance of banking system liquidity. In particular, it could usefully be picked up in the IMF’s Financial Sector Stability Assessments. The joint Fund-World Bank work on developing indicators of country balance sheet vulnerabilities and guidelines on prudent debt and foreign exchange reserves management is a very important complementary exercise (Box 2 in Section II).

## The United Kingdom

While various risks confront UK financial institutions and markets from the international scene, direct risks from the UK economy seem low at present. Economic growth exceeded expectations last year, and growth forecasts for this year have generally been revised upwards since the November *Review*. That will tend to make it easier for borrowers in general to service their debts – although the aggregate picture masks considerable variation across households, firms and sectors. Having been overvalued against the euro for some time, sterling has recently fallen back somewhat, which should help to alleviate pressures on internationally exposed companies. But other potential vulnerabilities may remain, given structural changes in the economy.

**Chart I: Dispersion of emerging market spreads<sup>(a)</sup>**



Sources: J P Morgan’s EMBI Global and Bank calculations.

(a) Plots standard deviation of spreads across the 24 emerging economies in J P Morgan’s EMBI Global. It does not show spreads themselves.

Direct evidence about the recent financial fragility of firms – from data on receiverships, for example – has been mixed, partly reflecting the differential impact of sterling’s strength over the past few years. There is some evidence that the profit margins of the least profitable ten per cent of firms in 1999 were unusually low relative to the average (Chart J); and that the most highly geared firms were relatively more highly geared than previously. This suggests that there could be pockets of vulnerability if macroeconomic conditions were to deteriorate.

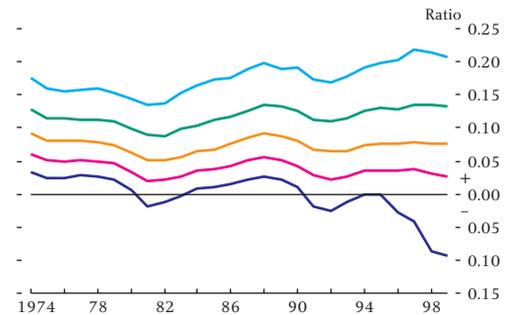
The household sector has benefited from rapid growth in personal disposable income and increases in asset prices, although the strength in the housing market has recently seemed to be moderating. Income gearing and capital gearing have not risen markedly, even though borrowing has been strong for some time and household debt is close to record levels relative to income. But the sector’s balance sheet could be adversely affected by a significant fall in equity prices and/or if nominal interest rates rose in relation to current expectations.

The UK banking system as a whole seems well placed to face the various risks summarised above. Since the November Review, the major British banks have reported continuing strong profitability and capitalisation (Chart K), comparing favourably with major banks in the United States and Europe. UK-owned banks’ exposures to EMEs remain relatively modest. Lending to the UK private sector has accelerated since last autumn, largely reflecting increases in household sector borrowing (Chart L). Competition in retail markets is intense. New entrants have won a large share of the flow of new deposits and mortgages. And there have been a few signs that the terms on which credit is granted are being relaxed. The FSA’s reviews of lending practices in mortgage and unsecured consumer credit business are, therefore, a welcome precaution.

Outside the banking sector, the problems in the life insurance industry – created by past pricing and hedging of guaranteed annuities and endowment policies – remain. There seem to be lessons here for both investors and firms about distinguishing between nominal and real returns and between expected returns and risk. But business confidence has improved recently and premium income growth has been rapid.

The integrity of the payments infrastructure should have been aided by the designation in May of CHAPS sterling and CHAPS euro under regulations implementing the EU Settlement Finality Directive (SFD), which came into effect in the United Kingdom last December. The SFD is intended to protect systemically important payment and settlement systems by putting certain aspects of their rules beyond legal doubt in the event of a participant’s insolvency. Other systems such as CREST are also

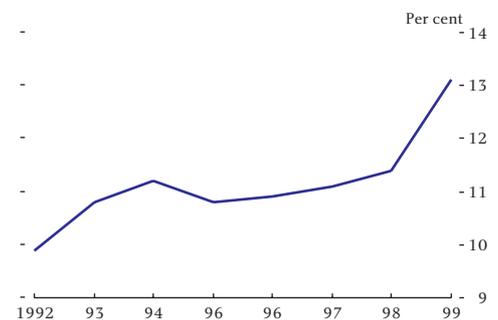
**Chart J:**  
Percentiles of distribution of profit margins<sup>(a)</sup>



Sources: Bank of England and Primark Datastream.

(a) As defined by profit before interest and tax divided by total sales. Percentiles are, from top to bottom, 90th, 75th, 50th, 25th, 10th.

**Chart K:**  
Risk asset ratio<sup>(a)(b)</sup>

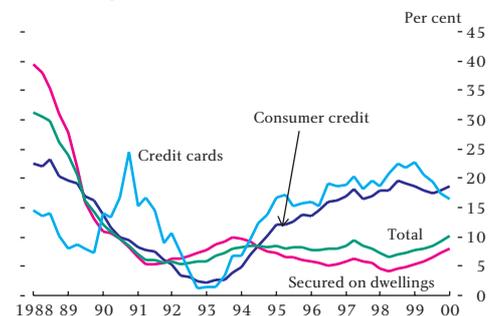


Source: Published accounts.

(a) Net capital/risk-weighted assets.

(b) Abbey National, Bank of Scotland, Barclays, Lloyds-TSB, Midland (now HSBC Bank), NatWest, Royal Bank of Scotland and Standard Chartered.

**Chart L:**  
Banks’ sterling lending to individuals (excluding the effect of securitisations)<sup>(a)(b)</sup>



Source: Bank of England.

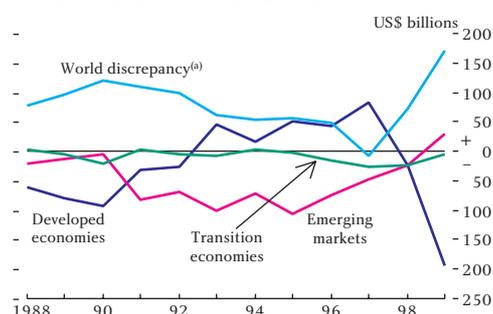
(a) Four-quarter growth rates.

(b) ‘Consumer credit’ includes credit-card lending and other lending to individuals not secured on dwellings.

likely to seek designation, further underpinning the integrity of the UK's securities clearance and settlement infrastructure.

More generally, Europe's market infrastructure – in particular, its exchanges, clearing houses and settlement systems – is going through a period of major structural change. This extends to ownership and governance arrangements: for example, exchanges are increasingly being structured as for-profit, shareholder-owned entities, which may be better able to prosper in an increasingly competitive environment. The financial risks tend, however, to be concentrated in clearing houses, which act as central counterparties in a number of important wholesale markets. It is vital that the integrity of their risk management policies and practices is maintained, which generally points to clearing houses being independent, not-for-profit, user-owned organisations.

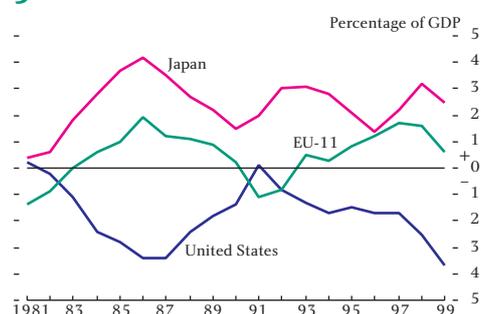
**Chart 1:**  
**World current account balances**



Source: IMF World Economic Outlook.

(a) Discrepancy reflects errors, omissions and asymmetries in statistics on current account flows.

**Chart 2:**  
**G3 current accounts**



Source: OECD Economic Outlook.

**Table 1: Consensus forecast<sup>(a)</sup> for annual GDP growth**

	1999	2000	2001
United States	4.1	4.8	3.2
Japan	0.3	1.1	1.9
EU-11	2.3	3.3	3.1
World	2.6	3.6	3.2

Source: Consensus Economics.

(a) Means of forecasts compiled by Consensus Economics.

## I Major industrial economies

### Global imbalances

There has been a pick-up in growth in the euro area and, to a lesser extent, in Japan since the November *Review*. The pace of expansion in the United States over 1999 Q4 and 2000 Q1 has remained faster still, and the US current-account deficit has continued to widen.

There have been sharp changes in current and capital account balances over the past three years. The combined current accounts of the developed economies shifted from a surplus of US\$43 billion in 1996 to a deficit of US\$195 billion in 1999 (Chart 1), largely because of the increase in the US deficit, to US\$340 billion or 3.7 per cent of GDP (Chart 2). Over the same period, EMEs' combined current account balance increased by US\$114 billion, as domestic demand fell and capital inflows declined following the Asian crisis<sup>1</sup>.

But the shifts may be coming to an end. Forecasts suggest that there will be a rebalancing of world growth over the next two years, with a slowdown in the United States; a gradual recovery in Japan; and stronger growth in the euro area and developing countries (Table 1). Consensus forecasts also suggest that the US current account deficit will stop widening next year. However, the deficit could be checked more rapidly by disruptive sharp changes in confidence and expectations within the United States, with implications for asset prices and exchange rates.

Despite this risk, which has been overhanging markets for some time, the expected volatility of the dollar exchange rate implied by options prices has remained within the range established over the past decade. In contrast, the uncertainty generated by the depreciation of the euro has caused its implied volatility against other major currencies to rise over the past year (Chart 3 shows the volatility of the euro, proxied before 1999 by the Deutschmark). Market contacts suggest that there are few large uncovered positions amongst intermediaries in the foreign exchange markets at present; hedge funds in particular are less active than up to the 1998 crisis.

### United States

The US economy has grown much faster than expected at the time of the previous *Review*, with GDP increasing at an annualised rate of 7.3 per cent in 1999 Q4 and 5.4 per cent in 2000 Q1. Consensus growth forecasts for 2000 have been revised up by 1 percentage point to 4.8 per cent (Chart 4). Credit to the non-financial private sectors grew by 9.8 per cent in the year to

<sup>1</sup> There is a marked gap between the estimated US\$238 billion deterioration of the current-account position of the developed economies and the recorded US\$114 billion improvement for EMEs. That largely reflects errors, omissions, and asymmetries in statistics on current-account flows around the world.

2000 Q1, while equity prices remain very high despite the downward adjustment in technology stock prices since March (see Section 3). Against this background, the Federal Reserve has raised interest rates by 100 basis points since the *November Review*.

#### Risks to the US outlook

Sharp changes in the macroeconomic environment can threaten financial stability by bringing about large swings in exchange rates and aggregate demand that were not anticipated by lenders and borrowers. There are some such risks in the United States at the moment, arising on the one hand from the current imbalance between aggregate demand and supply, and on the other from the uncertain behaviour of trend productivity. First, output may have risen above the level at which non-inflationary growth can be sustained, so that a greater-than-expected tightening of monetary policy would be required to bring the United States back on a sustainable growth path. Second, given the inevitable uncertainties about the implications of structural changes and, in particular, new technologies, there is a risk that the rate of growth the economy can sustain in the longer term may be lower than households and firms now expect. If expectations were to change for the worse, so would the expected ability of borrowers to service and repay loans.

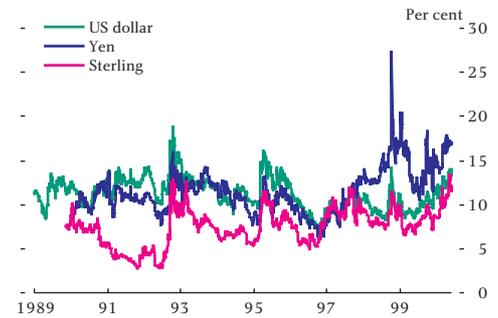
A sharp fall in US asset prices in response to any reappraisal of the sustainable rate of growth would also tend to bring about a rebalancing of international asset portfolios and a reversal in the growth of the surplus on the US capital account, slowing the growth of US net foreign liabilities (Chart 5). The subsequent changes in income and exchange rates would depend upon how quickly expectations changed, and how US monetary and fiscal policies reacted.

#### The household sector

The impact of any reassessment of long-run prospects is likely to be greater, the more that households and firms have anticipated future higher productivity growth in their own financing decisions. Households recorded a financial deficit in 1999 for the first time since 1955, largely as a result of the fall in gross saving; in 2000 Q1, the deficit amounted to 2.5 per cent of GDP. Borrowing by households has increased very rapidly over the past few years, pushing up the stock of outstanding debt to 97 per cent of disposable income in Q1 2000. Household income gearing has risen for the past five years, and is high given the current relatively low nominal interest rates (Chart 6).

The build-up of household debt could be a rational response to the apparent rise in long-run productivity growth and the rise in equity prices. And on the basis of valuations of equities and real estate, household balance sheets appear stronger than ever, with household net worth at record levels in relation to GDP (Chart 7). Households continue to be net purchasers of equities

**Chart 3:**  
Euro exchange rate implied volatilities<sup>(a)(b)</sup>

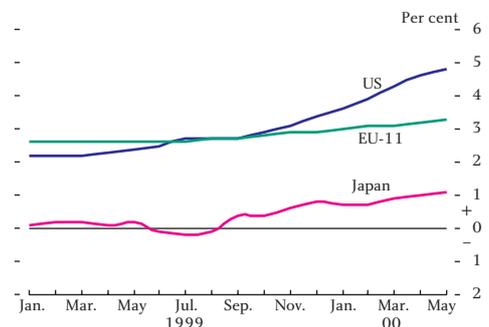


Source: Natwest capital markets.

(a) Three month.

(b) Deutschmark used instead of euro before January 1999.

**Chart 4:**  
Consensus<sup>(a)</sup> growth rates for 2000



Source: Consensus Economics.

(a) Mean of forecasts compiled by Consensus Economics.

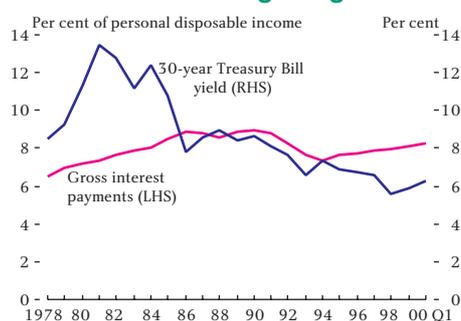
**Chart 5:**  
US net foreign assets<sup>(a)</sup>



Source: Board of Governors of the Federal Reserve System: 'Flow of Funds Accounts of the United States', 2000 Q1.

(a) The final observation is 2000 Q1.

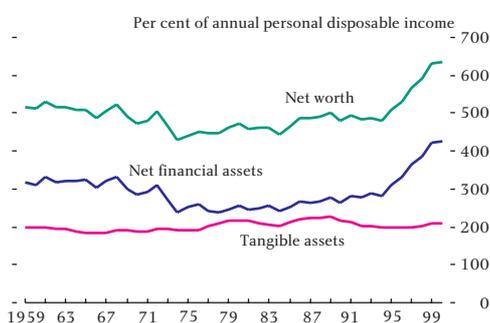
**Chart 6:**  
**US household income gearing**



Sources: NIPA and Primark Datastream.

via mutual funds, suggesting that they remain optimistic about asset prices. Indeed, despite market turbulence, the net inflows to US equity funds were at record levels in the first four months of 2000 (Chart 8), while lending by securities dealers and brokers to households (mainly margin debt) increased sharply up to Q1 (Chart 9). Margin debt did fall in April, but remains high. Household portfolios are exposed to an equity price fall: direct and indirect holdings of equities amount to 38 per cent of household financial assets. Some households may be relying on their ability to roll over existing debt or sell financial assets in order to meet payments of interest and principal. A sharp fall in equity prices might make this more difficult, and would particularly affect those who have taken on significant margin debt.

**Chart 7:**  
**US household wealth<sup>(a)(b)</sup>**



Source: Board of Governors of the Federal Reserve System: 'Flow of Funds Accounts of the United States', 2000 Q1.

(a) Equities and real estate at market values.

(b) The final observation is 2000 Q1.

### The corporate sector

The financial position of the business sector in aggregate appears more robust than that of the household sector, although not all indicators are favourable. Non-financial firms recorded a financial deficit of 1.5 per cent of GDP in 1999 and 1.8 per cent in 2000 Q1, which is relatively small. Income gearing in the corporate sector has risen for the past three years, but remains much lower than in the 1980s or early 1990s (Chart 10). The market value of the non-financial business sector's net financial assets (excluding equities) at end-1999 was higher relative to GDP than at any time since the late 1960s. But the ratio of debt to GDP in the sector is only just below its previous peak (Chart 11). And the stock of borrowing has risen by well over 40 per cent since 1995.

**Chart 8:**  
**Net inflows into US equity mutual funds**



Source: Investment Company Institute.

Consistent with a less favourable view of corporate finance, there have been many more ratings downgrades than upgrades for US bond issuers since mid-1998 (although the pace of this 'rating drift' has eased recently). The default rate on US corporate bonds was 3 per cent in the year to March 2000 compared with 2.8 per cent in 1999; the corresponding figures for speculative-grade bonds in the year to May were 5.4 per cent and 5.7 per cent. The telecommunications sector accounted for 20 per cent of bond defaults in Q1. Standard and Poor's (S&P) have argued that the health care, telecoms and real estate investment trust sectors, because of their rapid growth and higher leverage, pose heightened default risks to lenders.

### Commercial banking

How robust is the US banking system to potential shocks? It is well provided with capital. According to the Office of the Comptroller of the Currency (OCC)<sup>2</sup>, the overall Basel ratio for US commercial banks at the end of 1999 was 12.2 per cent, well above the 8 per cent minimum. And banks' net income, which affects how quickly capital can be restored after losses are

<sup>2</sup>: See OCC *Quarterly Journal*, March 2000.

incurred, rose by 16 per cent in 1999. Non-interest income has continued to be the fastest growing source of operating revenue, but its durability in a downturn is open to question, particularly for banks active in trading and venture capital business (see below). After five years of decline, the overall net interest margin was flat in 1999 at 3.5 per cent. That compares with 1 to 2 per cent margins typical in many European Union (EU) countries.

Large banks reported the strongest results, with buoyant non-interest and overseas earnings. Small banks suffered from declining margins, lower non-interest income, increasing expenditures and higher provisions; the return on assets for small banks was the lowest since the recession of 1991.

There have been a few signs of deterioration in the quality of banks' loan books. Risk-weighted assets rose from 77.5 per cent of total assets in 1998 to 79.2 per cent in 1999, which the Federal Deposit Insurance Corporation (FDIC)<sup>3</sup> see as implying higher exposure to credit risk. Non-current commercial and industrial loans rose by 28.8 per cent in 1999, and write-offs increased by 51.4 per cent. On the other hand, the levels remain low relative to the loan books, and write-offs of consumer loans fell. Anecdotal evidence suggests that there was a relaxation of loan underwriting standards two to three years ago. But banks appear to have responded to higher risks recently by tightening corporate lending standards, as confirmed by the latest quarterly Federal Reserve survey of loan officers. According to the FDIC, banks have tended to shift towards longer maturity fixed-rate assets, while building up liabilities that mature and reprice in less than a year (Chart 12); that would increase the industry's exposure to interest-rate risk to the extent that positions were unhedged.

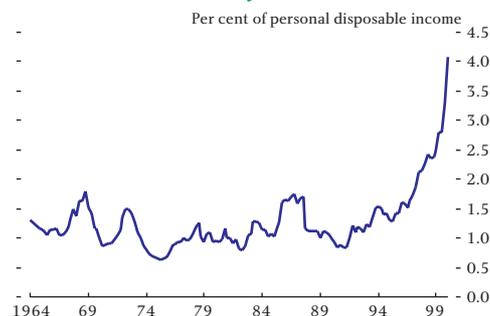
The main danger is that banks may be relying too heavily on projected loan repayments that will materialise only if expansion continues – as pointed out by the Federal Reserve Chairman Alan Greenspan<sup>4</sup>. S&P, in its report 'Financial System Stress' (January 2000), estimated that 5–15 per cent of loans by banks could default if the United States were to experience a long and deep recession like that of 1973–74 (note, however, that the estimate was similar in an exercise undertaken in 1999). Fitch IBCA<sup>5</sup> suggested that nonperforming assets started to rise at the end of 1998, having fallen since 1991. Venture capital exposures of large US banks have grown significantly, and capital gains on such 'private equity' accounted for a sizeable proportion of some of the largest institutions' profits in 1999 and into 2000. Such exposure concentrations need to be viewed in the light of the risks to the US economy which were highlighted above. The Federal Reserve is

3: See FDIC *Quarterly Banking Profile* 1999 Q4.

4: In a speech to the Independent Bankers Association of America on 8 March.

5: See 'US banking quarterly review – 1999 Q4'.

**Chart 9:**  
**US household security credit<sup>(a)(b)</sup>**

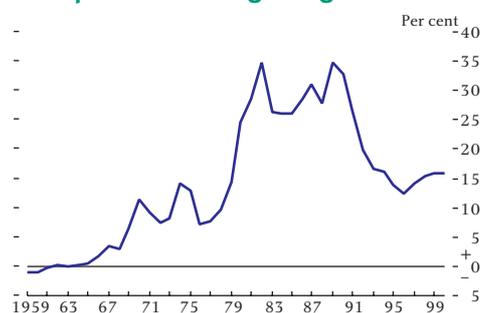


Source: Board of Governors of the Federal Reserve System: 'Flow of Funds Accounts of the United States', 2000 Q1.

(a) Security credit is defined as gross lending by dealers and brokers to households.

(b) The final observation is 2000 Q1.

**Chart 10:**  
**US corporate income gearing<sup>(a)(b)</sup>**



Source: Primark Datastream.

(a) Net interest/corporate profit (with inventory valuation and capital consumption adjustments).

(b) The final observation is 2000 Q1.

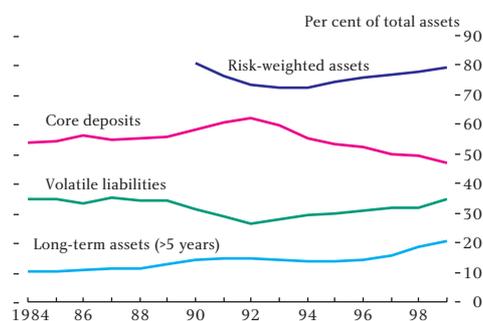
**Chart 11:**  
**US non-financial business sector debt-to-GDP ratio<sup>(a)</sup>**



Source: Board of Governors of the Federal Reserve System: 'Flow of Funds Accounts of the United States', 2000 Q1.

(a) The final observation is 2000 Q1.

**Chart 12:**  
Recent trends in US commercial banks' balance sheets<sup>(a)(b)</sup>

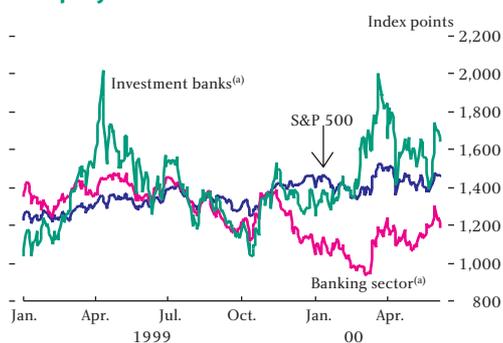


Source: Federal Deposit Insurance Corporation.

(a) Core deposits: total domestic deposits excluding time deposits over US\$100,000.

(b) Volatile liabilities: non-deposit liabilities which mature or re-price in less than a year plus time deposits of over US\$100,000.

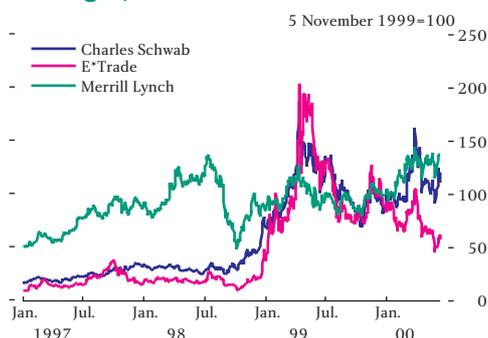
**Chart 13:**  
US equity market indices



Source: Bloomberg.

(a) Indices rebased to equal the S&P 500 on 5 November 1999.

**Chart 14:**  
Share prices of selected US equity brokerages/investment banks



Source: Bloomberg.

proposing to require banks to set aside capital equivalent to 50 per cent of the value of such 'merchant banking' investments.

Despite commercial banks' generally strong recent performance, equity markets appear to have taken a negative view of their earnings prospects. Since mid-1999, there has been a sharp fall in commercial bank share prices, both absolutely and relative to the market (Chart 13). Investors may think that the commercial banking industry has become more contestable. The internet revolution may hasten disintermediation and price transparency, both of which may entail pressure on profitability in the long run.

#### Investment banking

Investment banks have earned high profits because of the high turnover in securities markets and the opportunities last year for capital gains. It has allowed them to build up their equity buffer and in most cases reduce gross leverage (assets/equity). Firms' reduced risk appetite following the financial market turbulence of 1998 and early 1999 seems to have persisted and is reflected in their attempts to reduce their exposure to spread products and less liquid markets. They have managed to reduce dependence on trading income; client business and commission levels have become more important. But average underwriting fees have narrowed, and most experienced reductions in fee income last year.

The major global market events of the past few years are evident in investment bank and discount broker share prices. In contrast to the major investment banks the share prices of discount brokerage firms such as Charles Schwab and E\*Trade were unaffected by the market turmoil of autumn 1998 (Chart 14). Since then, investment banks shares have performed strongly (Chart 15), reflecting the high proportion of earnings from fee-generating activities such as underwriting and Initial Public Offerings (IPOs). Their share prices mirrored the Nasdaq/IPO exuberance during the spring of this year, falling back with April's correction. This suggests a market view that investment bank earnings – as well, perhaps, as those of some major commercial banking groups involved in investment banking in recent years – could be hit in the event of a sharp fall in equity market prices or in a flat market by reduced primary and secondary market activity.

The Gramm-Leach-Bliley Act came into effect on 12 March, repealing the long-standing restrictions substantially separating the banking and securities industries (contained in the Glass-Steagall Act of 1933). It also allows securities firms to become either Investment Bank Holding Companies, regulated by the Securities and Exchange Commission (SEC), or Bank Holding Companies, which would be regulated by the Federal Reserve as well as the SEC. That opens up the welcome possibility that the currently unregulated affiliates of US

securities companies<sup>6</sup> may become subject to regulatory capital requirements.

## Japan

Although GDP fell in the second half of last year, it grew by 2.4 per cent in 2000 Q1 (boosted by a leap-year effect), and growth prospects have improved. The consensus forecast of growth in 2000 has increased since November from 0.6 per cent to 1.1 per cent (Chart 4). Japan's domestic private sector saving has always been high relative to GDP, but last year the widening fiscal deficit helped to narrow the current account surplus to 2.5 per cent of GDP, from 3.3 per cent in 1998 (Chart 16).

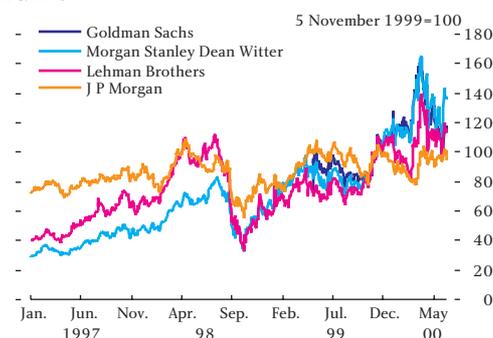
### Non-financial sectors

In 1999, the public sector financial deficit widened to 10 per cent of GDP, from 7 per cent in 1998. That increased the level of general government net debt (excluding those assets set aside for future social security fund expenditure) to 88 per cent of GDP by the end of 1999, and expected fiscal deficits for 2000 and 2001 look set to increase the ratio above 100 per cent. Box 1 explores Japan's fiscal outlook further. The public sector debt burden could limit the government's room for manoeuvre on fiscal policy and on any future public assistance for the financial sector. In some circumstances, it might also trigger a sudden increase in the risk premium on long-term Japanese government bonds (JGBs). That could, in turn, impose losses on banks, although their holdings of government bonds are believed to be mainly of shorter maturities.

Potential outflows from Post Office Saving accounts present another risk to the JGB market, as the value of maturing ten-year time deposits increased sharply in April and will remain high throughout FY2000 and FY2001 (Chart 17). As the government has reinvested these postal deposits in the JGB market, the fear has been that any rapid withdrawal of funds from the Post Office could force it to sell JGBs. So far, however, almost 54 per cent of maturing deposits have been reinvested in ten-year deposits, in line with the government's projection. But they offer a much lower rate of interest (0.25 per cent compared with 5.88 per cent in 1990) and can be withdrawn after only six months lock-in, so the risk of further substantial outflows from postal savings remains.

The household sector financial surplus declined to 2.7 per cent of GDP in 1999 from 6.5 per cent in 1998. The fall seems to reflect a decline in saving rather than an increase in investment, possibly reflecting a recovery in confidence in the financial system. Although Japanese households are apparently still averse to holding risky assets – currency and deposits are 55 per cent of their financial assets, as compared with 17.4 per cent in the

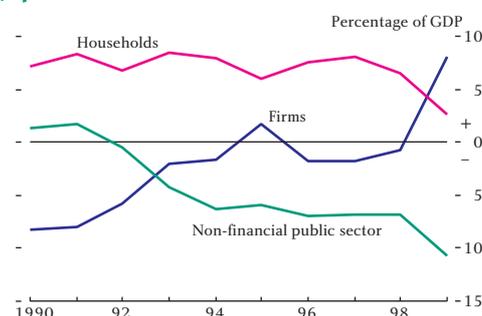
**Chart 15:**  
Share prices of selected US investment banks



Source: Bloomberg.

Note: J P Morgan, which is a commercial bank, is included since its activities closely resemble those of investment banks.

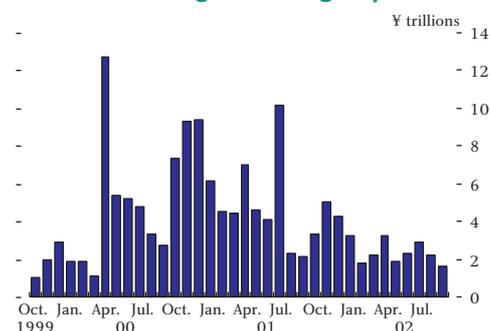
**Chart 16:**  
Japanese financial balances<sup>(a)</sup>



Sources: Bank of Japan and Japanese Economic Planning Agency.

(a) 1990-97 fiscal year data, 1998-99 calendar year data.

**Chart 17:**  
Post Office savings maturing deposits<sup>(a)</sup>

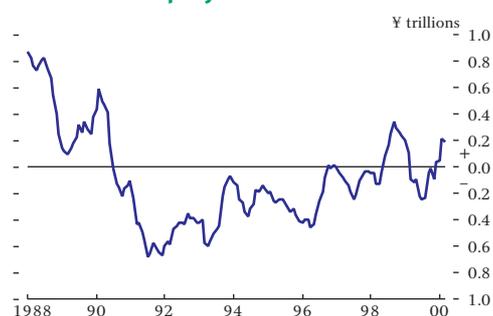


Source: Ministry of Posts and Telecommunications.

(a) Amount of savings certificate deposits made ten years earlier.

6: These affiliates are often used to book swaps and other derivatives business which does not need to be placed in an SEC-regulated broker-dealer.

**Chart 18:**  
**Net sales of equity investment trusts<sup>(a)</sup>**

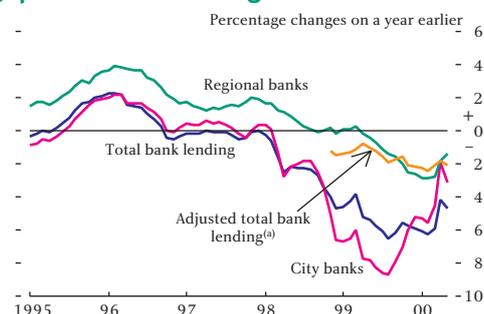


Source: Bank of Japan, The Investment Trust Association.  
**(a)** Six-month moving average used to smooth volatile monthly data. Most Japanese workers receive bonuses on a six-monthly basis.

United Kingdom and 12.4 per cent in the United States – sales of securities investment trusts (Japanese mutual funds), especially of ‘new economy’ domestic equities funds, have increased since the November Review (Chart 18).

The financial balance of the private non-financial corporate sector is estimated to have risen to a record 8 per cent of GDP in 1999 (from a 0.7 per cent deficit in 1998). That reflected both a return to modest real GDP growth and improvements in profitability due to progress in corporate restructuring. Ministry of Finance data show an 18 per cent increase in pre-tax profits for all non-financial firms in 1999, while Tokyo Stock Exchange (TSE) listed non-financial firms reported a combined 13 per cent increase in pre-tax profits.

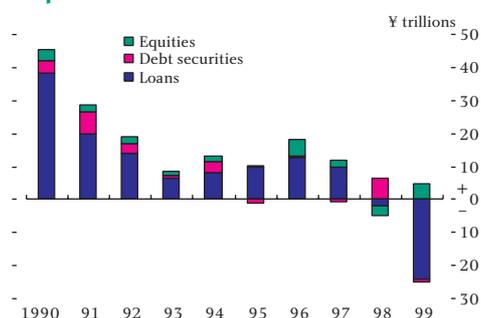
**Chart 19:**  
**Japanese bank lending**



Source: Bank of Japan.  
**(a)** Adjusted for debt write-offs.

Firms have used this financial improvement to restructure their balance sheets. In 1999, the corporate sector repaid ¥24 trillion in loans, compared to ¥2 trillion in 1998. This decline in bank lending appears to reflect falling corporate demand rather than supply constraints (Chart 19). Equity issuance in 1999 increased to ¥5 trillion, but companies raised less via commercial paper than they had the previous year (Chart 20). TSE-listed firms used their 13 per cent pre-tax profits increase to cover ¥3 trillion of unfunded pension liabilities and to write off sizeable valuation losses on real estate, reducing net profits to 20 per cent below the previous year’s level. As firms did not legally have to make these write-offs until the next financial years, their action suggests some improvement in financial conditions (Chart 21) and an increased acceptance of the need for more transparent accounting for valuation losses. While the rise in aggregate corporate saving has been necessary in order to restore corporate balance sheets, it has been deflationary, contributing to the fiscal challenge facing Japan.

**Chart 20:**  
**Financing of industrial and commercial companies<sup>(a)</sup>**



Source: Bank of Japan Flow of Funds.  
**(a)** Calendar year data for 1990-97, fiscal year data for 1998-99.

The overall improvement masks a wider dispersion of corporate performance, reflecting a shift of resources from ‘old economy’ to ‘new economy’ sectors. The resulting frictional costs are reflected in unemployment and bankruptcy rates that remain high by Japanese standards (Chart 22). High profile cases of corporate distress included the Sogo department store group’s plea in April to its 73 banks for ¥639 billion debt forgiveness. According to the Nikkei newspaper<sup>7</sup>, many of the banks have only just started to increase their provisions against their loans to Sogo. Any lack of prior provisioning against Sogo (which had net liabilities of ¥580 billion at the end of February) could suggest that, despite improved bad debt disclosure and provisioning, further bankruptcies could still add to Japanese banks’ bad debt problems.

7: Nikkei 23 May 2000.

**Table 2: Japan: mega-bank mergers**

Former banks	Announcement and implementation date	New mega-bank name and total assets
Dai-ichi Kangyo Bank Fuji Bank Industrial Bank of Japan	19 August 1999 announcement to integrate in autumn 2000	<b>Mizuho</b> Financial Group ¥140 trillion assets
Sumitomo Bank Sakura Bank	14 October 1999 announcement merger now on for April 2001	<b>Mitsui Sumitomo Bank</b> ¥98 trillion assets
Bank of Tokyo-Mitsubishi Nippon Trust Mitsubishi Trust & Banking	19 April 2000 announcement to integrate in April 2001	<b>Mitsubishi Tokyo</b> Financial Group ¥87 trillion assets
Sanwa Bank Tokai Bank	14 June 2000 announcement to integrate in spring 2001	New name to be announced ¥74 trillion assets

Source: Banks' unconsolidated results for year to March 2000.

*The financial sector*

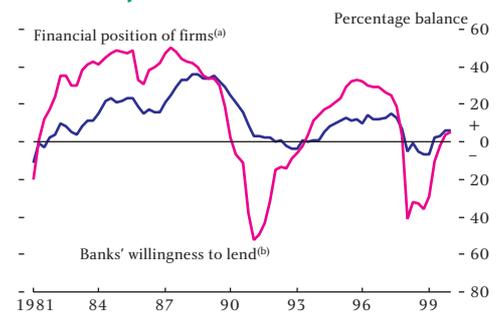
The rise in the stock market between the end of September 1999 and the end of March 2000 (Chart 23) made it easier for banks to sell part of their equity holdings at a profit. That, combined with a reduction in risk-weighted assets, raised the average Basel capital adequacy ratios of the major banks to 11.75 per cent as at the end of March 2000. However, the Topix has fallen by almost 10 per cent since the end of March<sup>8</sup>. Most of the major banks record their equity holdings at book value, but from September banks will be required to allow for their unrealised losses on marketable securities. This could significantly reduce the banks' capital adequacy ratios. Banks remain vulnerable to the impact of continuing weakness in land prices on collateral values (Chart 24). They seem to be unwilling to sell real estate at what may be the bottom of the market, and the Bank of Japan's zero interest rate policy means that the cost of carrying problem loans is negligible. Further corporate bankruptcies could also erode banks' capital.

Current plans envisage the formation of four new Japanese mega-banks<sup>9</sup>, each one of the world's largest banking groups ranked by assets (Table 2). The merged banks have the potential to be more profitable and more robust in the event of any future financial shocks. However, to unlock safely this profit potential,

<sup>8</sup>: With 'new economy' and smaller companies (as illustrated by the Jsdq index of OTC stocks) experiencing larger price declines and increases in volatility.

<sup>9</sup>: Since the previous Review, two further mega-bank alliances have been announced (between Bank of Tokyo-Mitsubishi and Mitsubishi Trust Bank and between Sanwa Bank, Asahi Bank and Tokai Bank – although Asahi Bank has since withdrawn) and there has been a realignment of larger non-bank financial institutions in line with the new mega-banks.

**Chart 21:**  
**Tankan corporate finance indicators**

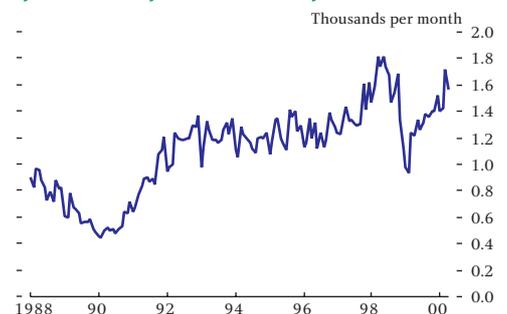


Source: Bank of Japan quarterly 'Tankan' survey of business sentiment, diffusion indices for principal enterprises.

(a) Percentage balance of respondents answering 'easy' minus 'tight'.

(b) Percentage balance of respondents answering 'accommodative' minus 'severe'.

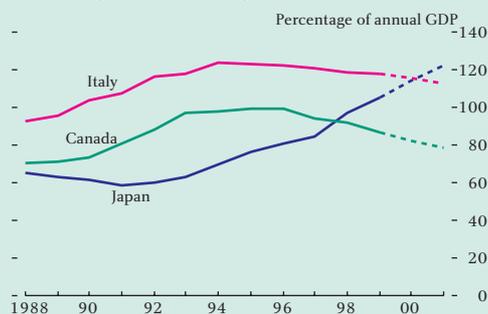
**Chart 22:**  
**Japanese corporate bankruptcies**



Source: Bloomberg.

Chart A:

General government gross debt<sup>(a)</sup>

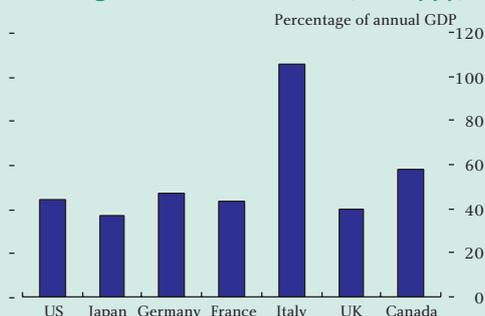


Source: OECD Economic Outlook.

(a) 2000-2001 observations are OECD forecasts.

Chart B:

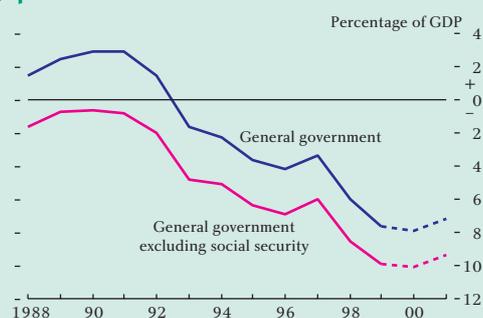
General government net debt (end-1999)



Source: OECD Economic Outlook.

Chart C:

Japanese fiscal balances<sup>(a)</sup>



Source: OECD Economic Outlook.

(a) 2000-2001 observations are OECD forecasts.

## Box 1: Japan's fiscal position

The Organisation for Economic Co-operation and Development (OECD) estimate that Japan's general government gross debt-to-GDP ratio<sup>1</sup> was 105.4 per cent of GDP at the end of 1999 and project that it will reach 122 per cent of GDP at the end of 2001. By way of comparison, Italy's debt-to-GDP ratio peaked at 124 per cent at the end of 1994 and Canada's peaked just under 100 per cent at the end of 1995 (Chart A). At first sight these figures suggest that Japan now faces a more serious fiscal position than Italy or Canada did in the mid-1990s. The picture differs if one looks instead at the net debt-to-GDP ratio, offsetting all government financial assets against its financial liabilities. The OECD estimate that at the end of 1999 Japan had the lowest general government net debt-to-GDP ratio in the G7 (Chart B).

Japan's relatively low level of net government debt reflects the fact that, unlike most countries, it has a partly funded public pension scheme. According to the OECD, the assets of Japan's public sector social security funds amounted to 47 per cent of GDP at the end of March 1998. These assets are hypothecated to meet the contingent liabilities arising from the public sector pension system. It is, however, misleading to include the assets of the social security system but not the associated pension liabilities in fiscal projections. Japan faces a rapidly ageing population so it is likely to need to draw down these social security assets or else raise social security contributions. Hence general government net debt excluding social security assets may be a more useful measure of government debt for the purposes of assessing the sustainability of the fiscal position. At the end of 1999 the debt-to-GDP ratio on this measure was about 84 per cent of GDP, second only to Italy amongst the G7 countries.

The OECD project that the general government financial deficit (excluding the surplus run by the social security system) will remain around 10 per cent of GDP over the next two years (Chart C). On these projections, the debt-to-GDP ratio (excluding social security) would reach 100 per cent of GDP by the end of 2001. Ratios of such a magnitude were in the past associated with an increase in the risk premium on long-term government debt. For example, in 1992 and 1993 when Italy's net debt-to-GDP ratio was around 100 per cent of GDP, the spread between Italian and German nominal long-term interest rates was over 5 percentage points while the consumer price inflation differential was around 1.5 percentage points.

<sup>1</sup>: After allowing for some limited netting off of holdings of central and local government debt.

the banks will need to strengthen their risk assessment expertise and also to handle the management risks created by large mergers. The authorities in turn, will need to ensure that such massive financial institutions do not become a significant source of systemic risk.

At present ‘moral hazard’ must be a major problem in the Japanese financial system. It is important that new and more restricted safety net arrangements are put in place, with the transition handled in a way which does not reawaken depositor nervousness. The government had planned to move from full to partial deposit protection in April 2001, in order to reduce moral hazard. On 29 December 1999, the government decided to postpone the change by a year, citing the need to allow time for the Financial Supervisory Agency to conduct inspections of smaller financial institutions previously supervised by local government. This decision followed an official report on 21 December 1999 from the Financial System Council on Japan’s future financial system safety net, which recommended smaller changes in the scope of deposit protection (eg by continuing full protection of accounts used to settle business transactions), in order to minimise depositor anxiety and avoid financial instability. The report also made several proposals for coping with future bank failures, including:

- a new framework to allow transfer of an insolvent bank’s sound assets and deposits to a receiver institution;
- existing ‘bridge bank’ system (using an existing or new government receiver institution if no private buyer can be found);
- injection of public money into weak banks and nationalisation of bankrupt banks (as emergency measures in the event of systemic risk).

While a menu of crisis management policy tools is desirable, it is important that it does not compound moral hazard risks by creating the impression of a ‘no fail’ policy. This risk would be reduced by holding shareholders and managers accountable, as the Japanese authorities have done when nationalising failed or failing banks.

Beyond the banks, developments since the previous *Review* in Japan’s troubled life insurance sector – new regulation, take-overs of weaker firms, and improved investment performance – have eased concerns about long-term solvency to some degree. In December and January, the government announced three policy initiatives: a recapitalisation of the Life Insurance Policyholders Protection Corporation; revisions to accounting rules; and a framework allowing ailing insurers to cut policy yields without entering liquidation. Several weaker life insurers have sought to ensure survival through recapitalisation, assisted either by related

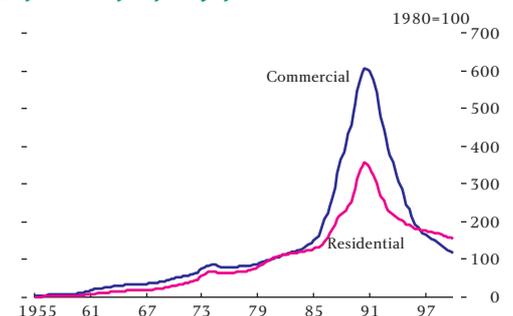
**Chart 23:**  
**Japanese equity market indices**



Source: Bloomberg.

- (a) Broader (capitalisation-weighted) index than the Nikkei.
- (b) Index of over-the-counter stocks, mainly smaller or newly established companies.
- (c) Indices rebased to equal the Topix on 5 November 1999.

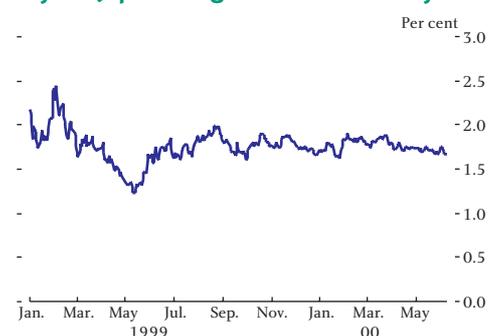
**Chart 24:**  
**Japanese property price indices<sup>(a)</sup>**



Source: Primark Datastream.

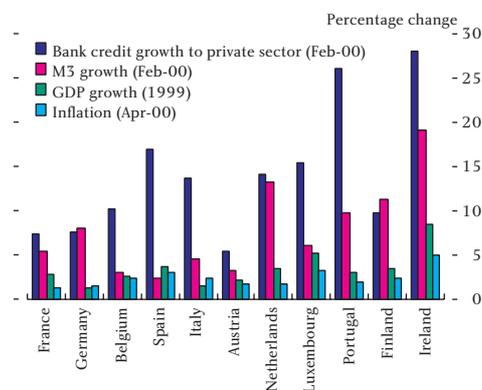
- (a) Land prices in the six major cities.

**Chart 25:**  
**10-year Japanese government bond yields**



Source: Bloomberg.

**Chart 26:**  
**Asymmetric developments in the euro area**<sup>(a)(b)</sup>



Sources: Eurostat, IMF and national central banks.

(a) Luxembourg M3 data are for January 2000.

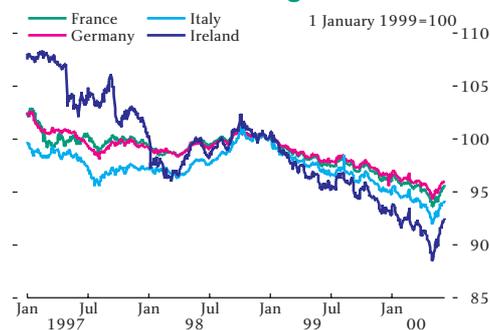
(b) Luxembourg, Portugal and Ireland GDP growth data are IMF projections.

**Table 3: Euro-area monetary developments**

	April 2000 end of month level (€ billions)	Annual growth rate
M3	4,901	6.5
Credit to euro-area residents	8,453	8.1
External assets	2,320	4.1
External liabilities	2,157	16.3
Long-term liabilities	3,674	6.9

Source: European Central Bank press release  
 (29 May 2000).

**Chart 27:**  
**Nominal effective exchange rates**



Source: Bank calculations.

companies or by foreign acquirers. The rise in the stock market in the financial year to March 2000 will have helped bolster the end-year market values of insurers' investment portfolios and solvency margin ratios (which are only calculated for end-March), though the Topix has now fallen back to its November *Review* level. Risks remain, as shown by the failure of Daiichi Mutual Fire and Marine Insurance Co (the first failure of a Japanese casualty insurer since World War II) on 1 May and of Daihyaku Mutual Life on 30 May. Whereas difficulties would be aggravated if the equity market were to fall sharply, a rise in JGB yields (Chart 25) could help the life insurers because their liabilities have a longer duration than their assets.

## The euro area

### Area-wide developments

The prospects for growth in the euro area have improved in the past six months, as in the United States and Japan (Chart 4); sectoral imbalances in saving and investment in the euro area as a whole are less evident than in those countries. The European Central Bank (ECB) has raised interest rates from 2.5 per cent to 4.25 per cent since the previous *Review*. Over the same period, the euro depreciated by over 10 per cent in effective terms, before recovering half the lost ground. Since the previous *Review*, the volatility of the euro/dollar exchange rate has increased.

Area-wide bank credit expansion (Table 3) has continued to be faster than nominal GDP growth. Growth of bank credit to euro residents in the year to April 2000 was 8.1 per cent, with credit<sup>10</sup> to the private sector up 11.4 per cent, and loans by 10.3 per cent. Bond issuance by the corporate sector continues at a pace well in excess of the rates typical prior to EMU (Table 4). These data suggest that the leverage of the private sector is increasing. The strength of overall credit expansion in spite of increasing interest rates reflected strong consumer and industrial confidence, M&A activity, and the interplay between credit and rising property prices. On the liabilities side, banks are experiencing disintermediation as mutual funds, in particular equity and bond funds, have been growing more rapidly than the stock of bank deposits. In order to finance credit expansion, banks have turned more to long-term bond issuance and interbank financing from outside the euro area (Table 3). Intra-euro area interbank lending has also grown rapidly<sup>11</sup>.

### Differentials across the euro area

Growth rates within the euro area still differ considerably (Chart 26). Since the ECB is unable to act directly where the risk of 'overheating' is confined to a small part of the euro area, the questions arise: whether gearing and asset prices could

<sup>10</sup>: Including both loans and securities held by banks.

<sup>11</sup>: See ECB Monthly Bulletin, April 2000.

**Table 4: Euro-denominated bond issues<sup>(a)</sup>**

€ billions	1998	1999	2000 Jan.-May
Central government	43.3	46.3	32.1
Private bank	243.0	329.5	131.5
Public bank	176.8	196.8	64.7
Private corporate	32.6	127.0	35.0
<i>of which EU-11</i>	18.4	84.6	15.3
Private finance	41.8	66.3	22.0
Other	63.5	75.7	22.5
<b>Total</b>	<b>601.0</b>	<b>841.6</b>	<b>307.7</b>

Source: Capital Data.

(a) Excludes auction-issuance, which implies an under-estimate of bond issuance by the national governments.

overshoot sustainable levels in some countries; whether domestic banking sectors in those countries would be robust to any subsequent correction; and whether there could be contagion to the rest of the euro area and, in particular, to the UK.

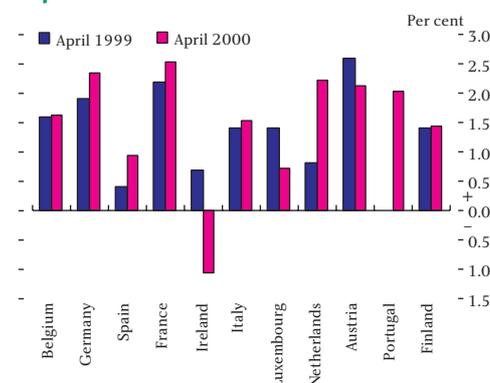
Growth differentials are already associated with differences in inflation<sup>12</sup>. Among the high-growth countries, inflation in April 2000<sup>13</sup> was 5 per cent in Ireland, 2.5 per cent in Finland and 3 per cent in Spain, although it was relatively low in Portugal (1.9 per cent) and the Netherlands (1.7 per cent). Such differentials could be exacerbated given the euro's depreciation over 1999, since the economies differ in their trade patterns. Ireland's nominal effective exchange rate weakened by 11.9 per cent between the start of 1999 and 3 May 2000, because of the importance of its trade with the United Kingdom and United States, while that of, for example, France, fell by 6.5 per cent (Chart 27). The variations in inflation give rise to differences in real interest rates, implying that monetary conditions are looser in countries with the highest inflation (Chart 28).

Rates of credit expansion are high in several of the high-growth countries, too; for example, in February 2000, they were over 20 per cent in Ireland and Portugal, compared with well below 10 per cent in France and Germany (Chart 26). There is a close link between credit growth and asset price increases – in particular, mortgage lending and house prices. The current annual rates of increase of house prices in Ireland and the Netherlands remain around 20 per cent. House prices in Ireland, the Netherlands and Finland have all risen by over 50 per cent since 1993 (Chart 29).

<sup>12</sup>: There are other factors behind changes in inflation differentials, such as changes in indirect taxation, convergence in the prices of tradable goods and the so-called 'Balassa-Samuelson' effect, which predicts that the relative price of non-traded goods rises more in countries with higher relative productivity growth.

<sup>13</sup>: Based on the harmonised index of consumer prices (HICP).

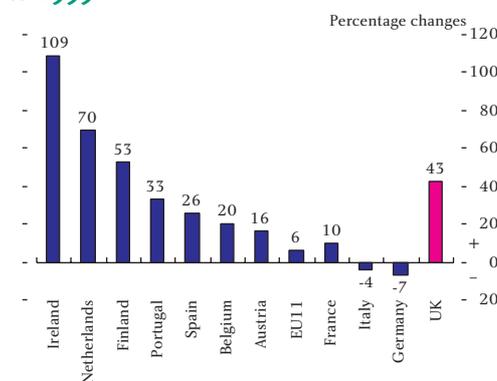
**Chart 28:**  
**Ex post real three-month interest rates**



Sources: European Central Bank and European Commission: 'Weekly Review of Financial Market Developments' (26/05/00).

Note: April 1999 observation for Portugal is zero.

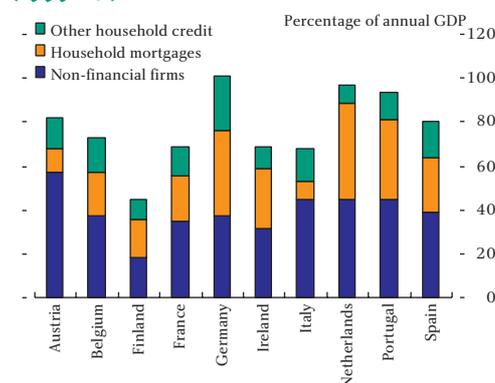
**Chart 29:**  
**Cumulative house price movements 1993 to 1999<sup>(a)</sup>**



Source: CSFB Euro-11 special report: 'Housing matters' (12/04/00).

(a) 1999 data are CSFB estimates.

**Chart 30:**  
**Stock of bank lending to the private sector (1999 Q1)**



Source: European Central Bank.

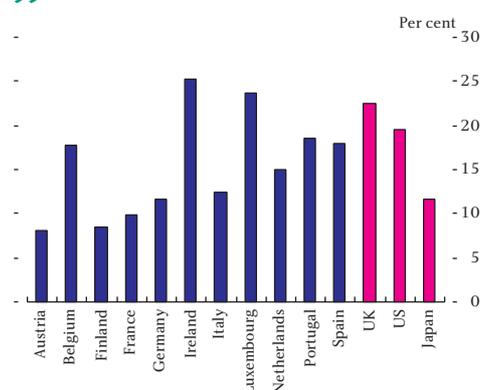
**Chart 31:**  
**Euro area equity market indices**



Source: Bloomberg.

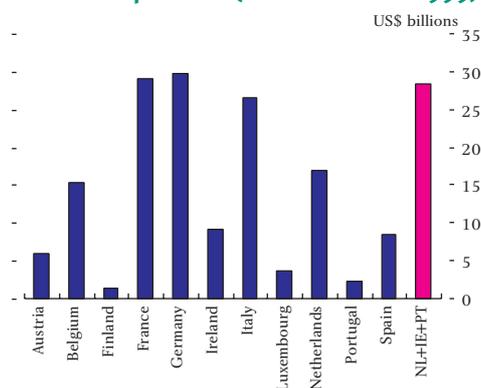
Note: Banking sector index and technology index rebased to equal the DJ Euro Stoxx index on 5 November 1999.

**Chart 32:**  
**Return on equity for Euro-area banks in 1998**



Source: Bureau van Dijk BankScope.

**Chart 33:**  
**UK bank exposures (end-December 1999)**



Source: Bank for International Settlements.

Note: NL: Netherlands, IE: Ireland, PT: Portugal.

Credit growth has outstripped broad money growth in several countries, notably Portugal, but also in Ireland, Italy, the Netherlands and Spain (Chart 26), implying that their banks have been increasing the share of non-deposit and external liabilities on their balance sheets. As a counterpart, the exposures of these countries' banking sectors to the international interbank market have tended to increase. For example, Portuguese banks' net external interbank liabilities, which are mainly in euros, amount to over 10 per cent of GDP.

Do any risks to financial stability arise from the divergent behaviour of some euro-area economies? Past experience (including that of the United Kingdom in the late 1980s) suggests that rapid credit expansion, especially following financial liberalisation, may lead to excessive gearing if banks and borrowers fail to recognise the point at which gearing and asset prices become unsustainable (for an indication of gearing, see Chart 30). Some of these countries are catching up with average productivity in the EU, exploiting opportunities for high investment returns. That makes the equilibrium level of gearing particularly difficult to assess, both for borrowers and lenders. High gearing could increase the vulnerability of household and corporate sectors to shocks, such as a loss of competitiveness due to higher relative inflation. Given the high proportion of floating-rate debt in Ireland and Portugal, any ECB interest-rate rises are likely to have a greater effect on expenditure there than elsewhere in the euro area, *ceteris paribus*.

Banking sectors appear reasonably robust. In most euro-area countries, aggregate capital adequacy ratios are well in excess of the Basel minimum, and there was an improvement in most euro-area banks' profitability in 1999. Euro-area bank share prices have risen since the previous *Review*, albeit less than stock prices in general (Chart 31). However, euro-area banks have had to face a longer-term contraction in interest-rate margins. Although non-interest income has risen to compensate, as in the United States, its durability is untested. Returns on equity tend to be high for banks in the higher growth countries (Chart 32), but that may partly reflect unsustainably rapid increases in the demand for credit.

Whether risks to stability elsewhere could arise from financial shocks in one of these countries depends on linkages between financial sectors. The combined UK banking exposures to some of the potentially overheating countries are substantial (Chart 33); exposures to the Netherlands are large, and together with Ireland and Portugal they are similar to those of France or Germany. The exposure of German, French and Italian banks to these three countries is also significant. It is important that countries' regulatory and other financial stability authorities keep a close eye on banking system risk, particularly when domestic banks are active internationally.

## II Emerging market economies

### Capital market developments

The November *Review* highlighted the tight external credit market conditions facing EMEs during much of 1999. Since then, debt negotiations have been successfully concluded between Russia and its London Club creditors, Mexico's credit standing has improved, and output in parts of Asia and Latin America has recovered. The prospects for growth in EMEs, particularly in Asia, Russia, and Mexico, have been revised upwards over the past six months (Table 5).

Against this background, aggregate spreads over US Treasuries have fallen by around 100 basis points since the November *Review* (Chart 34). But, since the start of the year, excluding Russia and Ecuador, spreads have in fact risen by around 110 basis points (more than the 25 basis point fall in ten-year US Treasury yields)<sup>14</sup>. Some of the increases in spreads this year may reflect a pick-up in bond and syndicated loan market borrowing, as well as the rise in US interest rates discussed below. Gross bond issuance by emerging market economies in 2000 Q1 exceeded US\$30 billion. That was the highest quarterly figure since the Asian crisis in 1997 Q3, though it is difficult to gauge the extent to which it represented a deferral from the end of 1999 as a result of Y2K effects (Chart 35)<sup>15</sup>. Access to international capital markets has not been confined to higher-rated sovereign borrowers such as Mexico. There has also been an increase in issuance by borrowers rated speculative grade or lower, such as Turkey and most Latin American economies. The volume of syndicated lending in 2000 Q1 was, at US\$28.1 billion, a post-Russia-crisis high, though this may reflect lending to finance specific projects in Asia<sup>16</sup>.

The Institute of International Finance is now expecting net private external financing of around US\$200 billion during 2000, compared with US\$170 billion at the time of the November *Review* (Table 6). Looking further forward, the IMF is forecasting a further increase in private capital inflows in 2001. There are reports of increased interest from investors who do not routinely buy EME paper.

These recent and prospective increases in net capital flows to EMEs in aggregate have not affected the marked divergence in regional spreads. Indeed, it has in fact increased slightly since the previous *Review* (Charts 36 and 37), particularly since the middle

<sup>14</sup>: Spreads weighted by the exposure of UK banks have also risen by some 50 basis points, to around 500 basis points. For a discussion of this measure, see Cunningham, A (1999): 'Emerging Economy Spread Indices and Financial Stability', *Financial Stability Review*, pp 115-127, November.

<sup>15</sup>: According to the Emerging Market Traders Association, turnover in emerging market debt was around 53 per cent higher than in 1999 Q4, and around 40 per cent higher than a year earlier. The increased trading volume may have contributed to the fall in spreads during Q1 by reducing liquidity premia.

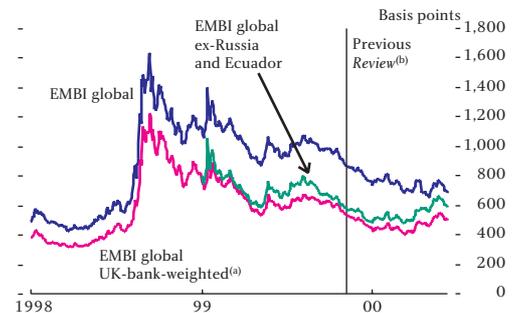
<sup>16</sup>: For example, a project financing loan to the Taiwan High Speed Rail Corporation accounted for some US\$9 billion.

**Table 5: EME growth prospects in 2000**

Per cent	At time of November Review	Latest IMF prediction
Asia	5.4	6.2
Latin America	3.9	4.0
Transition Economies	2.8	2.6

Source: IMF *World Economic Outlook*, Autumn 1999 and Spring 2000.

**Chart 34: EME sovereign bond spreads**

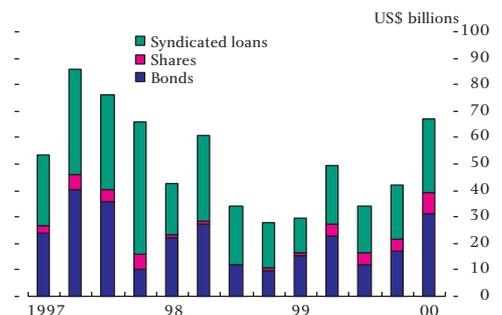


Sources: J P Morgan and Bank calculations.

(a) Uses EMBI global components weighted by exposure of UK banks.

(b) Level at the time of November 1999 *Review*.

**Chart 35: Gross foreign currency financing by instrument**



Source: Capital Data.

**Table 6: Private sector forecasts of emerging market economy net external financing**

US\$ billions	1999	2000
At November <i>Review</i>	157.6	169.7
Current projection (April 2000)	155.5	198.0

Source: Institute of International Finance

**Table 7: Current account deficits and amortisation burdens in Latin America**

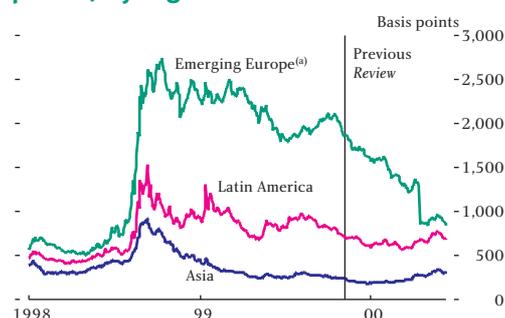
	Current account deficit in 2000 <sup>(a)</sup> (percentage of 1999 GDP)	Expected amortisation <sup>(b)</sup> in 2000 (US\$ billions)	Expected trade balance in 2000 <sup>(c)</sup> (US\$ billions)
Argentina	-4.7	16.0	-0.8
Brazil	-4.1	30.0	3.3
Mexico	-3.7	28.1	-8.2

(a) Source: IMF World Economic Outlook.

(b) Defined as amortization payments on debt of maturities over a year. Source: Argentine Ministry of Finance, Central Bank of Brazil and Chase Manhattan Corporation.

(c) Source: Consensus Forecasts.

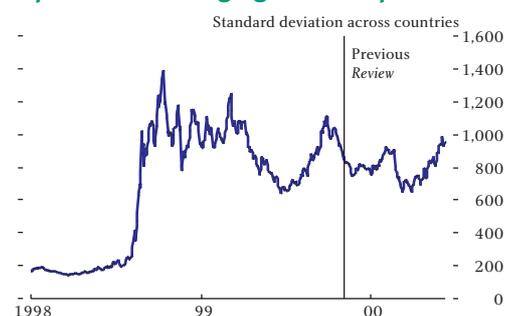
**Chart 36:  
Emerging market economy sovereign bond  
spreads, by region**



Source: J P Morgan's EMBI global index.

(a) Soviet-era debt instruments (principal notes or 'Prins', and interest-arrears notes or 'lans') were taken out of EMBI global index on 14 April 2000, and replaced by new eurobonds to be issued in exchange. This accounts for the discrete decline in spreads on that day.

**Chart 37:  
Dispersion of emerging market spreads<sup>(a)</sup>**



Source: J P Morgan's EMBI Global and Bank calculations.

(a) Plots standard deviation of spreads across the 24 emerging economies in J P Morgan's EMBI Global. It does not show spreads themselves.

of March; the standard deviation is around 300 basis points higher than then. That may be explained partly by investors differentiating more amongst EMEs according to their particular circumstances, which suggests that the risk of contagion may have fallen. The divergence may be partly due to differences in the demand for external funds too. While they have risen slightly since the previous *Review*, Asian spreads remain below pre-crisis levels, influenced by lower foreign currency financing needs. Aggregate current account surpluses in Asia are expected to be US\$32 billion in 2000, according to the most recent IMF *World Economic Outlook*, somewhat larger than expected at the time of the November *Review*. By contrast, countries in Latin America continue to run sizeable current account deficits, and are expected to increase their demand for external funds in 2000. The actual and expected amortisation burden in Latin America is also likely to exceed net foreign currency earnings, further raising the demand for new external funds (Table 7).

The picture in emerging Europe and the Middle East is more varied. Although emerging European spreads have declined steadily since the November *Review*, this has largely reflected events in Russia. Developments elsewhere, particularly the build-up of a large current account deficit in Poland and the associated currency volatility, could potentially offset some of this decline. The demand for credit in the region is fairly strong (particularly Turkey), although some countries (such as Russia and Ukraine) have very limited access to international capital markets. External borrowing in the Middle East is relatively low, and credit demand is likely to have been reduced by the rise in oil prices and the need to lower fiscal deficits. More generally, although the rise in oil prices has largely unwound the adverse terms of trade shock caused by the fall between 1997 and 1999, spreads facing oil exporters have not narrowed markedly relative to other emerging market economies (Chart 38). This may be because the oil price rise is perceived as temporary following the announcement, on 29 March, of an easing of Organisation of Petroleum Exporting Countries (OPEC) production restraints. There has also been speculation about further production cuts at the OPEC meeting on 21 June. Although the average price of oil rose from US\$22.8/barrel at the time of the November *Review*

to US\$29.3/barrel on 9 June, futures prices imply an expected decline towards US\$20.7/barrel in two years' time<sup>17</sup>.

Chart 39 plots expected US interest rates against emerging market spreads, excluding Russia and Ecuador. Actual and expected increases in US interest rates typically have a negative impact on emerging market prospects because they raise debt service costs and adversely affect growth prospects through trade. US monetary policy announcements in December and February had little impact on average spreads. But spreads have risen by almost 100 basis points since the tightening of US monetary policy on 21 March. Creditors may be beginning to think that the external environment is increasing the risk of debt service problems.

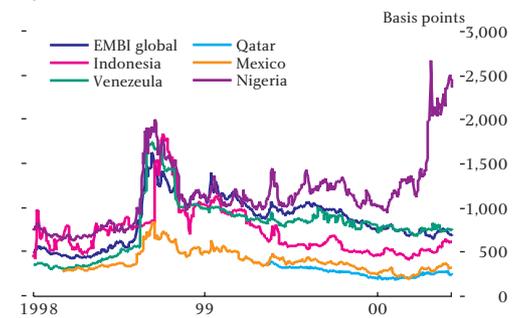
The impact of changes in exchange rates or interest rates is likely to be strongest on those countries, notably in Latin America, where there are large external financing needs and activity in the real and financial sectors is closely correlated with that in the United States. But even in countries with less foreign debt, a sharp change in market sentiment could lead to a difficult external financing environment, as falling equity prices dent firms' balance sheets and net worth.

The sharp fall in the Nasdaq index during April and the associated equity market volatility was accompanied by a fall in emerging market equity prices (Chart 40). The levels of volatility of emerging market equity and bond prices have risen markedly since the start of the year, although they remain below the levels recorded at the time of the Russian and Brazilian crises. The technology, media and telecommunications (TMT) sector accounts for over 50 per cent of market capitalisation in Asia, and over 20 per cent in both Latin America and emerging Europe. The emerging market IT index has fallen by around 17 per cent since its peak on 29 March, similar to the correction in the Nasdaq over the same period. Notwithstanding this correction, price-earnings ratios in Latin America and non-Japan Asia remain somewhat higher than during the 1990s (Chart 41). (Section III discusses the behaviour of industrial country equity prices in greater detail.)

### Risks to financial stability from EMEs

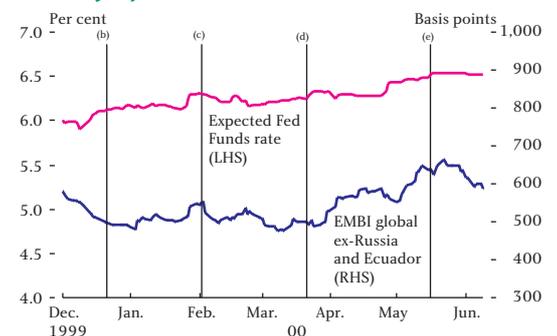
The developments in the external environment discussed above pose one type of risk to the emerging economies. Another is that a resumption of capital flows might exceed the pace of reform, particularly in the Asian crisis countries, to the extent of sowing seeds for future bouts of instability. A third, related, risk arises from weaknesses in national balance sheets, reflecting for

**Chart 38:**  
Sovereign bond spreads of prominent oil exporters



Sources: Bloomberg and J P Morgan.

**Chart 39:**  
US interest rates<sup>(a)</sup> and emerging market economy spreads



Sources: J P Morgan and Chicago Board of Trade.

(a) Based on June 2000 US federal funds rate futures contract.

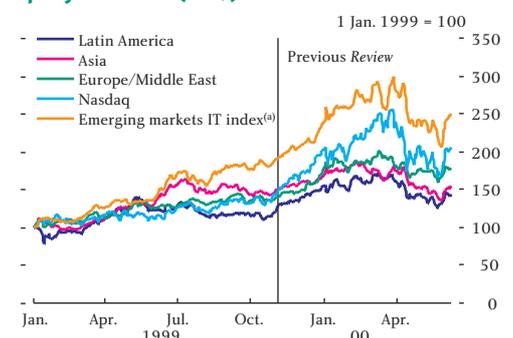
(b) 21 December, bias to tighten.

(c) 2 February, 25 basis point rise.

(d) 21 March, 25 basis point rise.

(e) 16 May, 50 basis point rise.

**Chart 40:**  
Nasdaq and emerging market economy equity indices (US\$)



Source: Bloomberg.

(a) MSCI emerging markets information technology index.

<sup>17</sup> The Bank of England May *Inflation Report* and May *Quarterly Bulletin's* assessment of the international environment discuss oil and commodity price behaviour in greater detail.

**Table 8a: Short-term external debt as a percentage of official foreign exchange reserves<sup>(a)</sup>**

Per cent	end-1996	end-1999
Argentina	139.3	134.4
Brazil	73.4	97.5
Mexico	138.2	73.9
Russia	235.2	129.1
Turkey	70.1	92.1
S Korea	198.3	47.5
Thailand	121.1	41.8

Sources: IMF and joint BIS-IMF-OECD-World database.

(a) Short-term debt is defined as residual short-term consolidated liabilities to banks.

**Table 8b: Short-term debt as a percentage of total external debt<sup>(a)</sup>**

Per cent	end-1996	end-1999
Argentina	23.0	24.6
Brazil	24.2	19.0
Mexico	16.4	15.2
Russia	30.3	10.1
Turkey	22.5	31.8
S Korea	47.1	26.9
Thailand	37.2	19.8

Source: joint BIS-IMF-OECD-World Bank database.

(a) Short-term debt is defined as residual short-term consolidated liabilities to banks.

**Chart 41: EME price-earnings ratios**



Source: Primark Datastream.

example imprudent external or internal debt structures in the public and/or banking sectors<sup>18</sup>.

The very different sources of potential imbalances in emerging market economies point to the importance of an integrated approach to risk management. The Financial Stability Forum's Working Group on Capital Flows recently recommended steps that countries could sensibly take to reduce vulnerability to liquidity crises and improve ability to withstand shocks (Box 2). These recommendations have a resonance now, as short-term debt is again expected to make up a significant portion of capital inflows to emerging markets during 2000; the Institute of International Finance is forecasting short-term debt to be around 35 per cent of total new borrowing. Tables 8a and 8b show how in Latin America short-term external debt as a percentage of reserves and of total external debt remains around pre-crisis levels.

**Chart 42: Argentina: country<sup>(a)</sup> and currency risk<sup>(b)</sup>**



Source: Bloomberg.

(a) Country risk is the spread on sovereign bonds, as recorded by J P Morgan's EMBI (Global constrained) measure.

(b) Currency risk is the difference between 90-day peso and dollar loans on the Buenos Aires interbank market.

As highlighted in the November *Review*, while reform measures are proceeding, inherited risks from short-term debt stand out for three countries in particular – Brazil, Turkey and Argentina. For the first two, imbalances remain in public-sector and bank balance sheets. In Argentina, by contrast, risks persist from large net foreign currency liability positions held by the public and corporate sectors.

#### Argentina

Currency risk in Argentina has declined sharply since the November *Review* (Chart 42), reflecting the resolution of uncertainty about the commitment to the currency board at the time of the October presidential elections. Table 9 illustrates the structure of Argentina's external balance sheet as at end-1999. The net foreign currency liability positions of the public and corporate sectors remain large. The amortisation burden is

<sup>18</sup>: A general discussion of this issue is contained in Box 4 (pp 22-23) in the *Conjuncture and Outlook* in the November *Review*.

## Box 2: Monitoring and managing risks from international capital flows

The April report of the Financial Stability Forum's Working Group on Capital Flows suggested a number of measures to help manage capital flows<sup>1</sup>. In the first place, national authorities need to assess the consequences of their policy actions, and in particular examine the extent to which they have the effect of encouraging biases towards short-term external and foreign currency debt. Beyond that, the Working Group recommended an integrated, prudential risk management framework for monitoring and assessing the risks and liquidity of the economy as a whole. This involves conducting a country risk *audit* which would be aided by drawing up balance sheets designed to identify significant exposures to maturity and foreign-currency mismatches and other risks – for the whole economy and for key sectors. A range of vulnerability indicators and stress tests needs to be developed to assess the resilience of balance sheets to shocks from the real or financial economy.

Policymakers are best placed to tackle risk management problems in the public and banking sectors, which are also the sectors generally most relevant to systemic risk. The Group recommended that operational guidelines, or sound practices, be formulated for public sector debt and liquidity management and suggested, amongst other things, that:

- a government should have a transparent risk and liquidity strategy covering the whole of the public sector, contingent as well as actual claims and obligations, and all currencies;
- the measures of cost and risk employed should be clear and should address rollover risk;
- interactions between debt and foreign exchange reserves policy should be addressed, in the light of a country's foreign exchange regime and its standing in international capital markets;

- interactions with risks in the private sector should be taken into account, including in foreign exchange reserves policy.

The International Monetary and Finance Committee (IMFC)<sup>2</sup> has asked the IMF and World Bank to develop such guidelines promptly.

On the banking side, the Group stressed the importance of prudent liquidity management alongside capital adequacy, urging that a high profile be given to the new Basel liquidity guidelines (see Box 8 in Section 6), and that banking system liquidity and foreign currency risk be covered in macroprudential assessments. It also suggested that, until a country's supervisory capacity is adequate, explicit regulations designed to limit liquidity and foreign exchange risks might need to be considered. Some emerging market economies are unlikely to be in a position to implement in full or rapidly the new capital adequacy framework being developed by the Basel Committee. It is therefore, very welcome that the Basel Core Principles Liaison Group is considering how the planned new capital accord can best be extended to emerging market economies.

More generally, good information is fundamental to risk management. The Working Group recommended that agencies with responsibility for financial stability should, therefore, promote better disclosure by banks (eg on liquidity in different currencies) and other financial firms, as well as better data on aggregate external financial positions. Gaps remain in the data on countries' external debt and on the creditor side. It is, for example, unsatisfactory that debtor-side data are often published (including under the IMF's SDDS) on the basis of original rather than residual maturity and of market rather than face values, and without a foreign/domestic currency split. Amortisation schedules, by currency, are needed to monitor and manage liquidity risks.

<sup>1</sup>: The Forum's work is available on [www.fsforum.org](http://www.fsforum.org)

<sup>2</sup>: *Communiqué* of the International Monetary and Financial Committee of the Board of Governors of the International Monetary Fund, 16 April 2000.

**Table 9: Argentina – foreign currency denominated financial assets and liabilities<sup>(a)</sup>**

US\$ billions	Assets	Liabilities	Net position
Public sector	27.8	113.4	-85.5
Private			
non-bank private	56.0	80.1	-24.2
banking	81.1	67.1	13.9

Source: Banco Central de la Republica Argentina and Bank calculations.

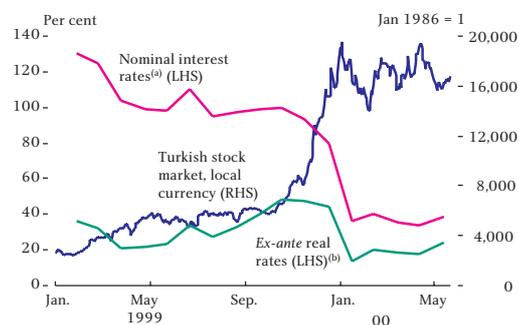
(a) Based on December 1999 data.

US\$16 billion in 2000. Argentina has already raised US\$8.1 billion this year through international bond issuance, and has agreed an IMF programme of US\$7.2 billion. Despite some progress in public debt management, however, short-term external debt remains high; and the consolidated public sector deficit rose to 3.8 per cent of GDP in 1999. These factors may partly explain why country risk, as measured by spreads on Argentine sovereign debt, has not fallen.

#### Brazil

In Brazil, the government has had some success in implementing key fiscal and monetary policy measures. But some of the fiscal problems that were at the root of Brazil's difficulties persist. Public sector debt was 47 per cent of GDP in Brazil at end-1999, compared with 42.4 per cent at the time of the 1998 crisis. The fiscal deficit, which was 10 per cent of GDP in 1999, is expected to be under 4 per cent of GDP in 2000, and a primary surplus of 3.25 per cent is forecast. The inflation targeting regime has also gained in credibility. The short maturity of government borrowing and heavy reliance on floating-rate and US dollar-indexed securities continues, however, to make debt dynamics sensitive to shifts in market sentiment. The government has taken steps to improve the structure of its domestic debt since the November Review. The share of floating-rate debt fell to 59 per cent in March from 68 per cent a year earlier, and that of dollar-linked debt to 22.5 per cent from 25.5 per cent. The share of fixed-rate debt now stands at 13 per cent, compared with 1.2 per cent in March 1999, and its maturity has increased to nine months, from around six months. But as long as such a debt structure persists, debt dynamics are liable to be adversely affected by any swings in investor sentiment that put downward pressure on exchange rates. At US\$30 billion, debt service obligations in 2000 are in excess of reserves.

**Chart 43:**  
**Turkish equity prices and interest rates**



Sources: Bloomberg and Bank calculations.

(a) Short-term Treasury bill issue rate.

(b) Ex-ante real rates calculated using short-term Treasury bill issue rates and a linear interpolation based on the assumption that the IMF inflation target is achieved at year-end.

#### Turkey

Risks to financial stability from Turkey seem to have moderated since the previous Review. On 22 December, the IMF approved a three-year programme of US\$4 billion aimed at disinflation and public debt stabilisation. The programme has resulted in considerable, conceivably excessive, market optimism – equity prices have risen by 136 per cent since the November Review and

nominal and real interest rates have fallen sharply (Chart 43). This, together with privatisation and fiscal measures, has improved the budgetary position. But substantial risks remain. In particular, there is a risk to the credibility of the stabilisation package if disinflation were to be slower than expected. The decline in the measured *ex ante* real interest rate appears unusually rapid, and there is a risk that future *ex ante* real interest rates could increase if inflation outturns were higher than expected. As Table 10 shows, the foreign currency net asset position of the public and banking sectors has not altered markedly since the previous *Review*. Shorter-term debt of less than two years continues to represent almost half of Turkey's public domestic debt stock. It is mostly held by Turkish banks, which in turn rely on short-term foreign borrowing for financing. These debt interlinkages could expose Turkey to material rollover, interest rate, and exchange rate risks if there were to be setbacks to the IMF programme.

**Table 11: Percentage of firms unable to meet current debt repayments, selected Asian countries**

	1996	1998	1999 Q2	Projected <sup>(a)</sup> (2000 - 2002)
Indonesia	17.9	58.2	63.8	52.9
Korea	11.2	33.8	26.7	17.2
Malaysia	5.6	34.3	26.3	13.8
Thailand	10.4	30.4	28.3	22.3

Source: Global Economic Prospects 2000, World Bank.

(a) Projections based on current interest rates.

#### Asian crisis countries

In the main Asian crisis countries, economic prospects have generally improved considerably. But there are still concerns about the extent to which banks remain burdened with non-performing loans, and the pace and scale of restructuring – both corporate and financial. Bank credit plays a crucial role in economic activity in the region. For example, private sector credit is around 80 per cent of GDP in Korea, compared with around 20 per cent in Mexico. Table 11, based on World Bank estimates and forecasts, illustrates the extent of corporate distress. It suggests that more than a quarter of stock market listed firms in Korea, Thailand, and Malaysia were unable to service their debt obligations in mid-1999. The situation in Indonesia was much worse. The forecasts imply that even with the current pace of reform, corporate distress will remain substantial and could be exacerbated if interest rates were to return to the levels of the early 1990s (Chart 44). The mirror image of firms' inability to meet debt obligations is the impairment of bank capital adequacy brought about by non-performing loans, which are high despite low interest rates (Table 12). Although progress has been made in recapitalising the banking sector, the fiscal costs involved remain significant.

**Table 10: Turkey – net foreign currency asset position**

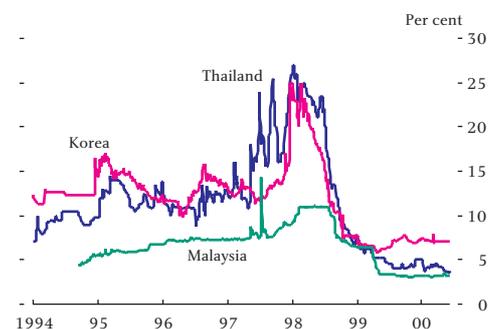
US\$ billion	Net position at November 1999 <i>Review</i> <sup>(a)</sup>	Net position at June 2000 <i>Review</i> <sup>(b)</sup>
Public sector	-29.5	-27.0
Banking sector	-10.1	-13.2

Sources: Turkish Central Bank, Turkish Bankers' Association and Bank calculations.

(a) Based on June 1999 data.

(b) Based on December 1999 data.

**Chart 44: Asian short-term interest rates<sup>(a)</sup>**



Sources: Bloomberg and Primark Datastream.

(a) Malaysia and Thailand: three-month interbank rate. Korea: three-month certificate of deposit rate.

**Table 12: Financial sector weakness, selected Asian countries**

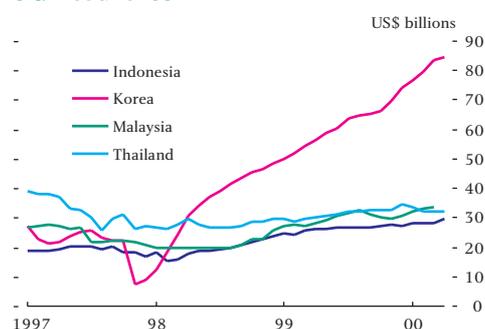
	NPLs <sup>(a)</sup> /total loans per cent	NPLs/GDP per cent	Remaining fiscal cost of recapitalising commercial banks as percentage of GDP <sup>(b)</sup>
Indonesia	50	25	48
Korea	19	27	4
Malaysia	20	30	6
Thailand	45	60	8

Source: Global Economic Prospects 2000, World Bank.

(a) Non-performing loans.

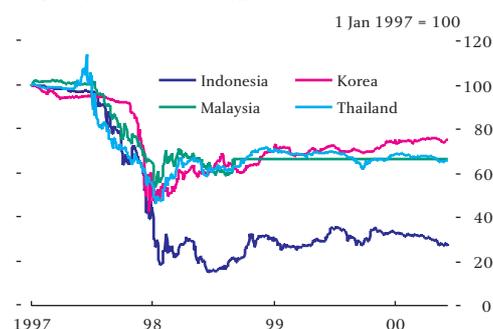
(b) World Bank estimates of government funds yet to be disbursed as at mid-October 1999.

**Chart 45(a):  
Gross international reserves in selected  
Asian countries**



Sources: IMF and Bloomberg.

**Chart 45(b):  
Selected Asian nominal exchange rates  
vis-à-vis the US dollar**



Source: Bloomberg.

So the hangover from the 1997-98 crises, by impairing the financial system's capacity to absorb future shocks, is itself a continuing source of vulnerability.

The scale of renewed capital inflows could also conceivably pose challenges for monetary and exchange rate policy in the main crisis countries. The situation in Korea is striking. Inflationary pressures have emerged as capacity utilisation has returned to pre-crisis levels. The authorities have sought to manage the exchange rate, building up reserves to offset potential upward pressures from resumed capital inflows (Charts 45(a) and 45(b)). But the intervention has been less than fully sterilised, and the resulting increases in broad money growth have further added to inflationary pressure. The annual growth rate of M2 was around 30 per cent in April, compared with an average annual growth rate of 19 per cent in 1998. Interest rates were raised by 25 basis points to 5 per cent in February, and forward rates suggest that short-term rates are expected to rise to 9 per cent one or two years ahead. Although the recovery in Korea is more advanced than in other parts of Asia, some other countries which have been actively managing their exchange rates may face similar latent inflationary pressures.

**Table 13: Korea – external balance sheet**

January 2000 - US\$ billions	Assets	Liabilities	Net position
Total	146.5	136.8	9.7
Long-term	25.0	96.9	-71.9
Short-term	121.5	39.9	81.6
of which public	77.6	29.5	48.1
of which Domestic			
financial institutions	51.9	46.5	5.4
of which Foreign banks	4.0	13.3	-9.3
of which Corporations	13.0	47.5	-34.5

Source: Korean Ministry of Finance and Economy.

As Table 13 illustrates, the aggregate external balance sheet in Korea does not reveal large-scale mismatches. But the Korean chaebol remain highly geared and the debt maturity is typically less than three years. So the risks from rising domestic interest

rates seem significant. The five largest chaebol were set debt-equity targets of 200 per cent by end-1999. With the exception of Daewoo, the targets appear to have been met – largely through equity issuance rather than substantial debt reduction. Domestic Korean banks and investment trust companies (ITCs) own most of the chaebol debt. The recent liquidity problems of some affiliates in the Hyundai group highlight how corporate failures can expose financial vulnerabilities, particularly amongst the ITCs. So further corporate and financial restructuring is required to reduce ITC redemption risks.

In Indonesia, the IMF has recently approved disbursement under a new programme that emphasises structural reform. The build-up of bad debts means that banking reform will eventually impose large fiscal costs. Public debt has already risen to around 100 per cent of GDP, making public finances potentially vulnerable to interest rate and oil price shocks. Political uncertainty is also high. Although direct UK bank credit exposures to Indonesia are relatively low (US\$3.2 billion), BIS-area exposures to the region, at around US\$200 billion, are significant.

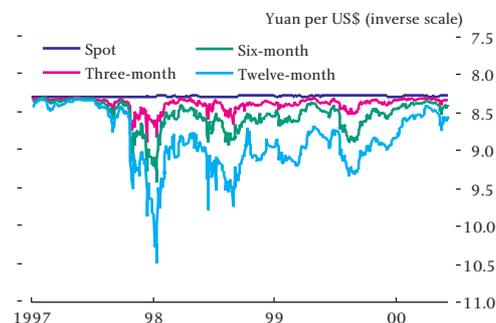
How resilient are banking systems in the region? Since the November *Review*, there have been runs on second-tier banks in the Philippines and Taiwan – although these do not appear to have had wider destabilising effects, despite a marked pick-up in Philippine spreads. Banking sector reforms in the Asian crisis countries have included recapitalisation schemes, formation of asset management companies and reduced barriers to entry for foreign banks. Explicit deposit insurance schemes have been developed in some cases, and regulatory capital ratios above the Basel minimum are generally reported – although differences in accounting standards make comparisons difficult and ratios above the 8 per cent minimum are needed in systems exposed to particularly volatile capital markets. In some countries (for example, Indonesia and Korea) recapitalisation has been achieved by freely offering government bonds to banks. While bolstering capital adequacy, this exposes the banking sector to fiscal risks and potentially reduces incentives to engage in effective intermediation.

#### China and Hong Kong

In China, economic growth has picked up since the previous Review. Annual GDP growth was 8 per cent in 2000 Q1, compared with an average annual growth rate of 7.1 per cent during 1999. As a result, current expectations of devaluation, as measured by currency forward rates, have receded (Chart 46).

As noted in the November *Review*, risks to financial stability in China may stem from the interaction between state-owned enterprises and the banking system, with a prospectively significant fiscal cost. Weak revenue-raising capabilities and

**Chart 46:**  
**Chinese non-deliverable forward rates**



Source: Standard Chartered.

future contingent liabilities (for example, pensions) mean that the question of public debt sustainability may arise in the medium term. Efforts to contain bad debts appear to have progressed since November, and include the establishment of asset management companies. The momentum of these reforms seems likely to be maintained if economic growth remains strong. Medium-term growth prospects could be enhanced by entry into the World Trade Organisation (WTO). In the shorter run, confidence could be affected if WTO entry is not achieved and, if it is, membership could entail some short-term output costs that could slow the pace of reform.

Pressures on the currency board in Hong Kong have also dissipated. Consensus forecasts suggest real GDP growth of 5.8 per cent in 2000, compared with 2.7 per cent expected at the time of the *November Review*. Property prices have been falling – they dropped 7.1 per cent on a year earlier in April and are down by 47 per cent compared with the peak in October 1997. Short-term interest rates have risen since the *November Review*, so that *ex post* real rates of interest, at around 14 per cent, remain high. Together with declining property prices, that may affect bank balance sheets, especially as residential loans account for almost a third of total local lending by the banking sector. But the Hong Kong Monetary Authority reports that the banking system is well capitalised<sup>19</sup>.

#### *Russia*

Russia accounted for around 6 per cent of BIS-area bank claims on emerging market economies at the end of 1999. Since the *November Review*, there has been greater political stability, and an agreement with the London Club on the rescheduling of US\$32 billion of commercial bank debt. The agreement significantly reduces the net present value of the debt and extends its maturity profile. High oil prices have contributed substantially to an improved outlook for economic activity – Consensus Forecasts suggest that GDP growth in 2000 is expected to be 4.1 per cent, compared with 1.4 per cent at the time of the *November Review*. These factors have contributed to a sharp fall in spreads of around 1,500 basis points since November. Some US\$10 billion in external debt payments are due this year, compared with foreign reserves of US\$19.9 billion. So the immediate risks appear, on balance, to have moderated. But considerable economic reforms are still needed to sustain the recovery and maintain external debt repayments. Russia's ability to satisfy IMF programme conditions will be critical to the restoration of access to private capital flows.

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<sup>19</sup>: A detailed discussion of the Hong Kong banking sector is offered in Carse, D 'The importance of corporate governance in banks', speech delivered to the Association of International Accountants, 17 March 2000.

### III International financial markets

Six months ago, the most tangible short-term risk to stability was from how markets and firms would manage the millennium-date change (see Section IV of the November Review). As 1 January approached, however, concerns tended to become less pronounced, partly because major central banks had made it clear that they stood ready to provide additional liquidity to markets if that proved necessary. In the event, there were no significant problems. Since then, market conditions have been anything but calm – ‘new economy’ equities in particular have been highly volatile. But so far there have been no material spillovers. A degree of comfort can probably be taken from that, from markets having smoothly absorbed US monetary policy tightening, and from there having been some welcome correction in equity market prices, particularly ‘new economy’ stocks, and in exchange rates. Continued uncertainty in the wider economic environment and persistent volatility in markets do, though, underline the vital importance of rigorous risk management being maintained in financial firms.

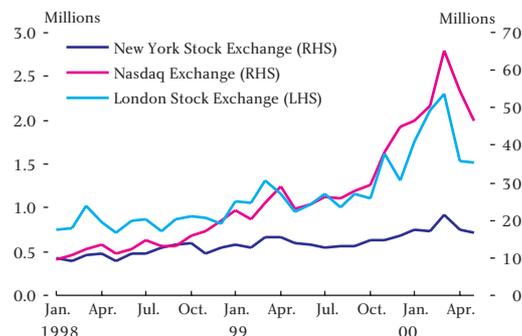
#### Equity markets

##### Infrastructure performance: a few strains

Trading and settlement volumes in equity markets around the world increased sharply during the first quarter of 2000 (Charts 47 and 48), partly reflecting retail investors being drawn into the market by sharply rising prices towards the end of 1999 and into 2000 (volumes have fallen back more recently, but remain high). While settlement and clearing systems have coped well, a few strains appeared in some automated trading systems. Such systems have potential benefits for efficiency and stability, but they could also give rise to risks if they break down or malfunction. Recent incidents include the closure of the Swiss Stock Exchange trading platform, SWX, for one and a half days on 11-12 November 1999; and, since the November Review, the closure of the Toronto Stock Exchange system for half a day on 7 March 2000; the London Stock Exchange’s electronic order book, SETS, opening more than half a day late on 5 April 2000; and the late opening of the Milan Bourse system on 26 April.

Whether breakdowns have wider consequences for stability depends on their duration, the coincidence of price-sensitive events, and how easily market participants can find other ways to trade, such as via alternative trading systems or bilaterally with market makers. Some of the recent problems did, in fact, occur during a period of a high equity market volatility (Chart 49), but fortunately there were no material knock-on effects. It is important that these incidents be followed up by regulators and that any lessons are learned by infrastructure providers.

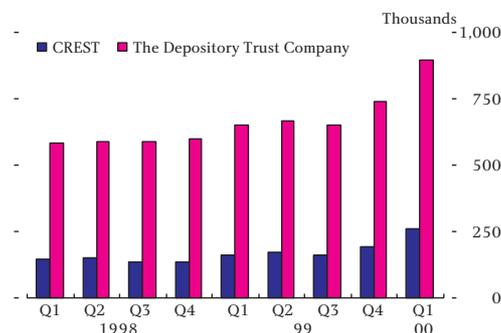
**Chart 47:**  
Monthly number of bargains on the LSE, NYSE and Nasdaq<sup>(a)</sup>



Sources: London Stock Exchange, New York Stock Exchange and Nasdaq.

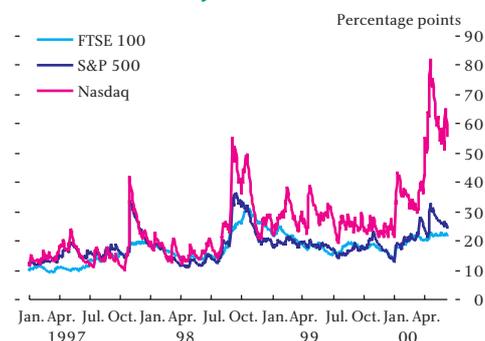
(a) Data are collected on a different basis by each exchange and may not be comparable.

**Chart 48:**  
The average daily number of settled transactions within CREST and DTC



Sources: CREST and the Depository Trust Company.

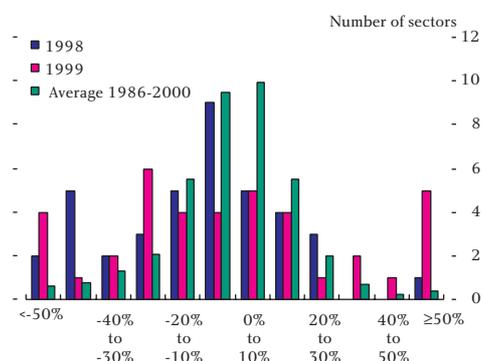
**Chart 49:**  
Historical volatility of share indices<sup>(a)</sup>



Sources: Primark Datastream and Bank of England.

(a) Volatility calculated as annualised 252-day rolling exponentially-weighted moving average of squared daily log returns.

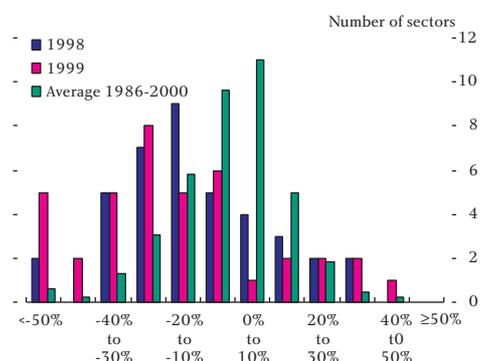
**Chart 50:**  
**Distribution of sectoral returns in excess of FTSE All-Share index returns**



Sources: Primark Datastream and Bank of England.

Sectors with returns in one or more periods in excess of 50% were telecoms, IT hardware, IT software, steel and other metals, mining, electronics and electrical equipment. Sectors with excess returns of -50% and below were IT hardware, household goods and textiles, forestry and paper, water, tobacco, electricity, food production and processing, steel and other metals.

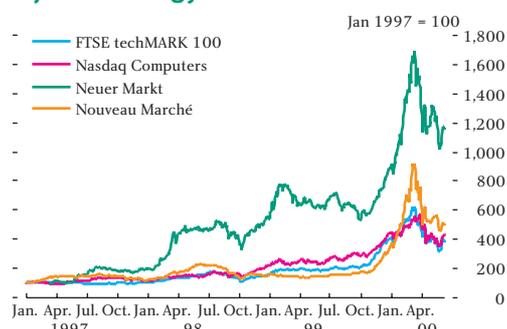
**Chart 51:**  
**Distribution of sectoral returns in excess of Datastream US total market index returns**



Sources: Primark Datastream and Bank of England.

Sectors with excess returns in one or more periods of -50% and below were real estate, mining, water, tobacco, distributors, support services, food and drug retailers.

**Chart 52:**  
**Major technology indices**



Source: Primark Datastream.

*Market correction and volatility*

The prolonged rise in the overall level of world equity markets has been described in previous *Reviews*. In the United Kingdom, the pattern of sectoral returns in recent years has also been striking. The distribution of returns of the 39 FTSE All-Share individual sectoral indices changed shape dramatically in 1998 and 1999, with several sectors (both ‘old’ and ‘new’ economy) reporting excess returns of 50 per cent or more below or above the index (Chart 50). The extent of recent out-performance by the highest-return sectors was unusual – and has not occurred in the United States (Chart 51).

The volatility of all UK sectoral indices has also risen over the past three years, with over two-thirds of sectors registering record volatility. In the past, the fastest rising sectors have tended to be more volatile than the overall market.

More recently, technology stocks in particular seem to have behaved quite differently from other sectors. They rose extremely rapidly between October 1999 and late-February 2000, fell back sharply in March and April, and have recovered somewhat since then (Chart 52). In consequence, the correlation between the S&P 500 and the Nasdaq fell sharply during the first quarter of 2000 (Chart 53); similar patterns were visible in the UK and French markets (although not in Germany). Given the differences, the TMT sector is analysed separately below after a review of overall market developments.

The major equity indices, mostly still dominated by so-called ‘old economy’ stocks, have fallen slightly from recent peaks (Chart 54). For example, the Wilshire 5000 (the most broadly based US equity index) is over 5 per cent below its 24 March peak, although it is still more than 5 per cent above the level at the time of the November *Review*<sup>20</sup>. The FTSE-All Share is down around 5 per cent from its peak but still up about 4 per cent since the previous *Review*. (Only a small part of the late-1999 rally in German equities has since unwound.)

Many equity market strategists remained bullish throughout the April-May falls<sup>21</sup>. And since the March market peak, net inflows to US (and European) equity mutual funds have tended to continue, albeit with temporary slowdowns (or even modest outflows) in weeks in which markets fell significantly (Chart 55). There are not, therefore, especially strong signs from the flow data of a shift in retail demand away from equities.

<sup>20</sup>: The equivalent figures for the S&P 500 are down 4½ per cent from its peak and up 6 per cent since the previous *Review*. The Wilshire is a more complete measure of the overall market. It contains 14 times as many stocks, and has a market capitalisation 1.3 times greater than the S&P 500.

<sup>21</sup>: Over the medium term, markets should be expected to rise given productivity growth, so persistently bullish strategists should be right more often than they are wrong about market direction.

However, equity markets in general, and technology stocks in particular, continue to be highly valued according to conventional benchmarks even after the welcome correction described above. In nearly all major industrial country markets, price-earnings ratios (based on historical earnings) remain high. And the traditional dividend discount model (DDM) suggests that, even if the equity risk premium were to be as low as 2 per cent, the current level of US equity prices would be warranted only by real growth in dividends roughly twice as fast in future as on average since the Second World War<sup>22</sup>. Markets in Japan and the major European countries are also apparently overvalued on this basis, albeit to a lesser degree.

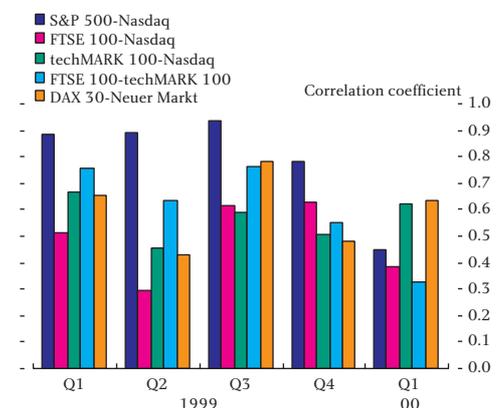
While these two factors – a lower equity risk premium and upward revisions to expected trend corporate earnings growth – might both help to explain the large equity price rises of the *past* few years, they would have quite different implications for *future* returns to investors. In particular, a fall in the equity risk premium would be associated with a *one-off* rise in the return on equities. Once any such adjustment had occurred, *ex ante* returns would be *lower* than otherwise, other things being equal. It has, however, seemed at times that investors might be participating in markets on the basis of expected equity returns simply extrapolated from the bull market conditions of the past few years.

One window on wholesale market participants' views of the prospects for the major indices is provided by implied volatilities and 'probability distributions' derived, under certain assumptions, from options prices (Charts 56 and 57). In contrast to the technology market indicators discussed below, there has not been much change since the November *Review*. It seems that participants in both the US and UK markets still attach a higher probability to a large market fall than to an equally large rise, but these negative skews have not increased following this spring's market volatility. And uncertainty, proxied by the derived distributions' variance, has not risen. (Various caveats concerning the interpretation of the derived probability distributions are discussed in Box 3.)

Whatever their views on market prospects, contacts suggest that many financial intermediaries do not themselves have large direct exposures to the direction of equity market movements, and that in some cases firms have taken positions that could benefit from high volatility.

Apart from proprietary positions in the traded options market, a common source of these 'long volatility' positions is currently

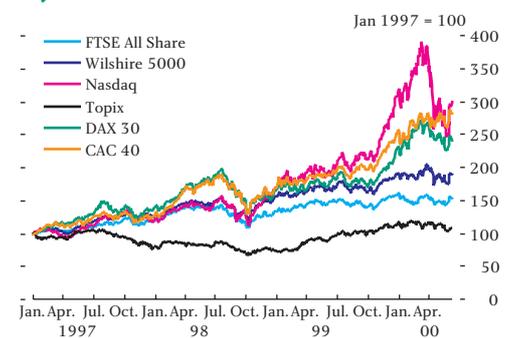
**Chart 53:**  
Correlation between stock indices<sup>(a)</sup>



Source: Primark Datastream.

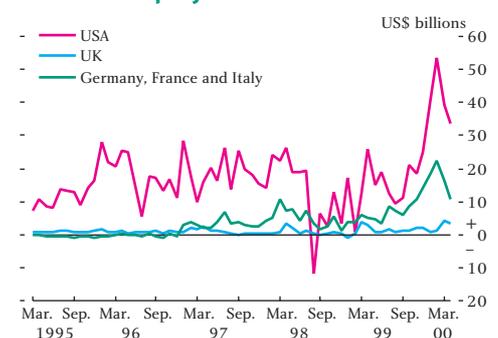
(a) Correlations of weekly price changes over three-month periods.

**Chart 54:**  
Major market indices



Source: Primark Datastream.

**Chart 55:**  
Flows into equity mutual funds



Sources: US: Investment Company Institute; other countries: Merrill Lynch.

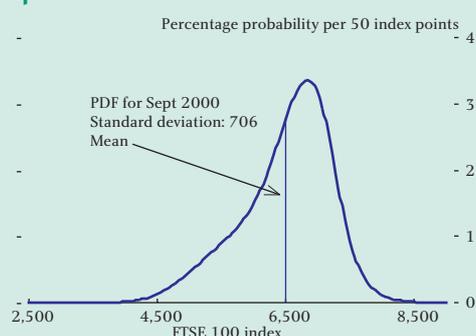
<sup>22</sup>: The use of the dividend discount model in analysing equity market valuation was discussed in Section II of the June 1999 *Review* assessment of financial stability conditions. The future growth rate of dividends implied by the DDM for the United States may be biased upwards to the extent that the measure of the real interest rate used here – the real yield on US Treasury Inflation Protection Securities (TIPS) – is higher than the underlying long-term real rate of interest in the United States.

## Box 3: Do equity 'PDFs' derived from options prices reveal the market's probability distribution?

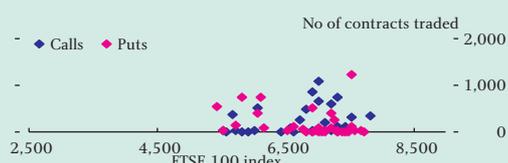
Option prices are almost unique in offering a potential source of information about the likelihood that market participants assign to different outcomes for future market prices. As in earlier *Reviews*, probability density functions (PDFs), derived from data on prices of options on equity indices, are used to analyse the market's views about the future path of equity prices (Chart A)<sup>1</sup>.

### Chart A:

#### Implied PDFs for FTSE 100<sup>(a)</sup>



#### Options traded on 09/06/2000<sup>(b)</sup>



Sources: Bank of England and LIFFE.

(a) Derived from options on 09/06/2000.

(b) Options on the September 2000 contract.

As large falls in equity prices may pose a potential threat to financial stability, asymmetries within the probability distribution and the lower tail of these PDFs are of particular interest.

The implied PDFs for equity *indices* tend to be negatively skewed even when the implied PDFs for *individual* stocks are symmetric, possibly because correlations between individual stock prices tend to increase in the event of sharp market falls.

Some indication of the market's assessment of the probability of an equity market fall greater than a specified percentage can be derived from the area under a lower tail of the PDFs. Chart B displays such a measure and indicates the implied risk-neutral probability of a greater than 20 per cent fall in the FTSE 100 index in the next three months increased between 1997 to end-1998 but has fallen somewhat since early 1999.

### Chart B:

#### Implied risk-neutral probability of a greater than 20 per cent fall in the FTSE 100 in the next three months<sup>(a)</sup>



Source: Bank of England and LIFFE.

(a) Calculated as a 20 per cent fall relative to the index value on the date the PDFs are derived.

While such PDFs, and statistics derived from them, are helpful in allowing information to be derived from option prices in a systematic way, and the general shape of these PDFs is informative, a number of important caveats need to be stressed<sup>2</sup>.

First, the method for deriving PDFs produces so-called *risk-neutral* probabilities, which are equivalent to risk-adjusted probabilities only if agents are indeed risk neutral. But agents are almost certainly risk averse. This is likely to mean that the risk-adjusted PDF lies to the right of the derived, risk-neutral PDF. For example, the mean of the risk-neutral PDF is equal to the price of the equity index futures contract. But if a risk premium is attached to equities, the futures price will generally lie below the true expected future spot price.

<sup>1</sup> The derived PDFs represent a hypothetical probability distribution for a representative investor, or for a market of investors with homogeneous beliefs. In reality, market participants are heterogeneous, and market prices and PDFs reflect their myriad opinions.

<sup>2</sup> In addition to the issues highlighted here, there are important technical questions involved in estimating PDFs. The Bank has investigated the stability of estimated PDFs in the face of possible measurement errors in options prices. Smoothed volatility smile methods, used to produce the PDFs in this *Review*, are found to be more robust than the main alternative, namely double-lognormal approximation methods – see Bliss and Panigirtzoglou, 'Testing the Stability of Implied Probability Density Functions', Bank of England Working Paper 114, May 2000.

This difference between the position of the risk-neutral PDF and the risk-adjusted PDF implies that the measure presented in Chart B will overstate the market's assessment of the likelihood of a fall in equity prices. The extent of this difference is largely determined by the size of the risk premium<sup>3</sup>.

Second, the PDFs are derived under the assumption that market participants can hedge their positions perfectly. But this assumption is unlikely to hold, especially in times of high market volatility, when traders may be unwilling to write options contracts that provide insurance against large price falls. That implies that market participants are potentially more exposed to price falls than to price rises.

Third, regulatory constraints may mean that market participants benefit less from large price rises than they suffer from equivalently large price falls, which may for example have the effect of taking a firm below regulatory capital requirements. Both the second and third caveats mean that some investors may be prepared to pay more for downside insurance than would otherwise be the case. If the market is not perfectly arbitrated, the prices of (deep out-of-the-money) put options may be higher than warranted solely by market participants' assessments of the likelihood of sharp price falls. This will exaggerate the negative skew in the derived PDFs, although it is very difficult to assess the extent of this bias.

Fourth, the tails of the PDFs may be a less reliable indicator of the market's expectations than the centre of the distribution, because options with extreme strike prices tend to be traded less frequently (see lower panel of Chart A)<sup>4</sup>. The market prices of the most recent trades at these strikes therefore have to be adjusted to reflect the prices at which such options *would have* traded on the date the PDFs are derived. In consequence, the estimated tails of the PDFs may reflect previous days' traded prices and the model from which the notional prices are derived.

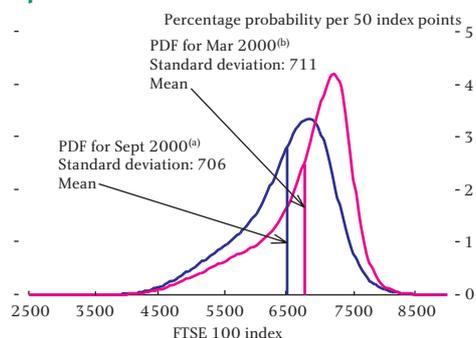
Finally, the technique assumes that market agents are forward looking in their analysis of news. If, however,

traders were simply to make somewhat mechanical assumptions about future volatility on the basis of past volatility, the derived PDFs (and implied volatility statistics) could be misleading as a measure of the market's forward-looking view of uncertainty and skewness.

**3:** Chart B shows risk-neutral probabilities and makes no allowance for equity risk premia. Making allowance for risk premia (which may fluctuate through time) is unlikely to have a large impact on three-month horizon probabilities, except possibly in very disturbed market conditions.

**4:** Estimated PDFs are more robust the larger the cross-section of strikes on which they are based. FTSE options have a larger cross-section than, for example, options on short sterling futures. For less-robust PDFs, estimates of the higher moments (skewness and kurtosis) can be very uncertain – see Bliss and Panigirtzoglou (*op cit*).

**Chart 56:**  
**Implied PDFs for FTSE 100**

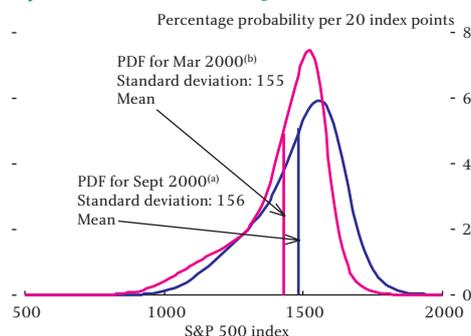


Sources: Bank of England and LIFFE.

(a) Derived from options prices on 09/06/2000.

(b) Derived from options prices on 10/12/1999.

**Chart 57:**  
**Implied PDFs for S&P 500**

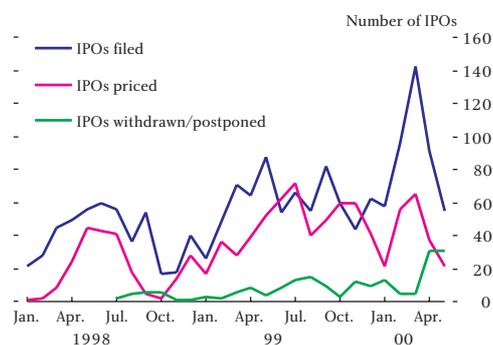


Sources: Bank of England and Chicago Mercantile Exchange.

(a) Derived from options prices on 09/06/2000.

(b) Derived from options prices on 09/12/1999.

**Chart 58:**  
**US IPOs**



Source: ipo.com.

reported as being related to put options bought from companies with share buy-back programmes. The intermediary may 'delta-hedge' in the underlying equity, leaving a net position that would benefit if volatility rises. Financial intermediaries are also said to be insuring<sup>23</sup> individuals or firms against large price falls in the value of a major equity stake in a company by selling them an out-of-the-money put option, with the investor financing the premium on the put by simultaneously selling to the intermediary an out-of-the-money call. Typically, the structure of the pay-offs for the composite transaction is that the customer benefits from low volatility and the intermediary benefits from high volatility. However, in the event of extreme market movements, the intermediaries' position could change from being 'long' volatility to 'short' volatility.

Even if intermediaries were to have successfully insulated their capital against major changes in the level or volatility of prices, many do, as discussed in Section I, have a large *business* (or earnings) exposure to the equity market. One particularly important source of income recently has been the TMT sector.

## The telecommunications, media and technology sector

### Equity markets: IPOs, volatility, and Boo.com

The boom in publicly-traded new technology stocks has been accompanied over the past year by high levels of start-up financing, both through venture capital and, as the next stage of the investment pipeline, through private finance being converted into public finance through the Initial Public Offer (IPO) market. After a sharp rise in March as the Nasdaq reached its peak, US IPO activity has fallen back; in May the number postponed or withdrawn exceeded the number brought to market (Chart 58). A similar pattern of postponements has been seen in Europe. A persistent slowdown could potentially reduce the ability of venture capitalists and merchant banking funds to realise earlier mark-to-market gains.

After an IPO, there is a *lock-up* period of around six months during which the managers, underwriters, major shareholders, and venture capitalists who brought the deal to market are barred from selling their shares. Market participants keep track of when these lock-up periods end as a potential time of selling pressure. The lags after the peak in US IPO activity mean that a large number of lock-up periods have been ending there since May (Chart 59), creating a potential market 'overhang'.

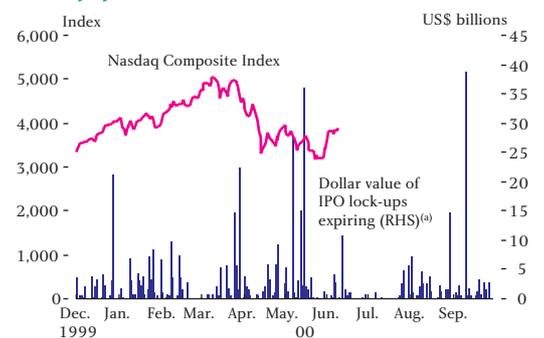
<sup>23</sup>: In addition to banks and securities firms, insurance companies – and perhaps particularly reinsurance companies – increasingly seem also to be participants in the equity and other capital markets, as the boundary between financial products and insurance products blurs. Among their activities, insurers are hedging customer equity-related investment products and applying their wider expertise in risk management to the options markets. The different regulation and accounting standards that apply to insurers can allow them greater flexibility to hold long-term options positions than a bank or securities firm might have.

The 'technology-heavy' Nasdaq has, in fact, fallen nearly 25 per cent since March – but is still 25 per cent higher than in November, and 75 per cent higher than at the beginning of 1999. Since the November Review, technology indices in, for example, the United Kingdom, Germany and France first rose even more sharply than the Nasdaq, but then fell further (Chart 52).

Volatility in the sector has been very high. The incidence of 'large' changes in the Nasdaq this year has been exceptional (Chart 60). The fifth and second largest daily percentage price falls since 1971 occurred on 3 and 14 April (8 per cent and 10 per cent respectively); and on 30 May, it posted the largest ever daily percentage rise (8 per cent). Indeed, the Nasdaq registered a 19 per cent rise in just four trading days between 26 May and 2 June. Forward-looking implied volatilities have also risen very sharply since last October, reaching a peak in April (Chart 61). While stocks in this sector are generally hard to value against conventional benchmarks – as the businesses are based on novel applications of new technologies and many firms do not yet have positive cash flow or earnings – Nasdaq implied volatility is remarkable. It has averaged around 60 per cent since the beginning of April, compared with an average of 30 per cent during the late 1990s. Taken at face value, this implies that the range of future values for the Nasdaq that the market considers possible has risen to very high levels. In particular, market participants seem to be placing a very high value on insurance against price falls; on or shortly after the price drops on 3 and 14 April, the volume of put options traded increased sharply (Chart 62).

In the United States, some of the recent correction and volatility was triggered by the Microsoft judgment on 4 April, and by various economic data from March onwards, which prompted the market to expect tighter monetary conditions. In Europe, another trigger was the failure of Boo.com in May, which contributed to a 9 per cent fall in the FTSE techMARK 100 index the next day. It has been suggested by a number of commentators that investors regard 'new technology' firms as something of a 'lottery', on a view that many – or even most – start-up firms may well fail but that a diversified portfolio may contain some big winners, so that a high average return is expected. If this theory were correct, it would be surprising for the failure of a single venture capital start-up to trigger a reappraisal of high-tech stocks generally. The reaction to the Boo.com failure may therefore suggest that the market was prompted to reassess whether it had become unrealistically optimistic. It occurred against a background of heavy retail oversubscription for some high-profile IPOs, despite the inevitably large number of business and market risks described in prospectuses. This poses a question about how well prospectuses are studied by investors.

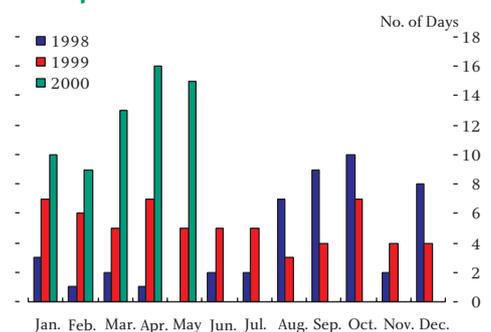
**Chart 59:**  
**Lock-up periods**



Source: IPO lockup.com and Bloomberg.

(a) After 12 June, the value of future IPO lock-up expiries is calculated using share prices on that day.

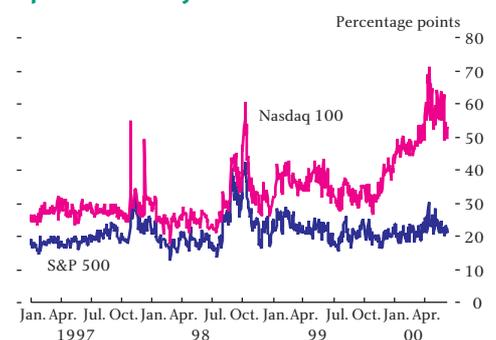
**Chart 60:**  
**Frequency of large daily changes in the Nasdaq<sup>(a)</sup>**



Sources: Bloomberg, Nasdaq and Primark Datastream.

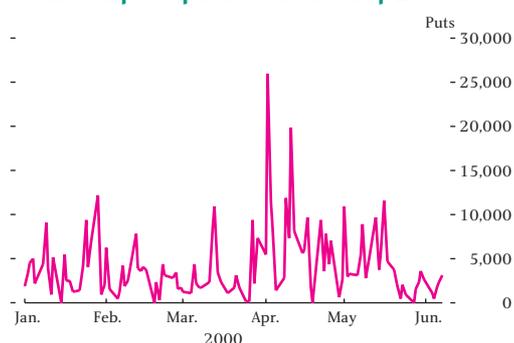
(a) Number of days during the month on which the Nasdaq moved by more than two per cent.

**Chart 61:**  
**Implied volatility of US stock indices**



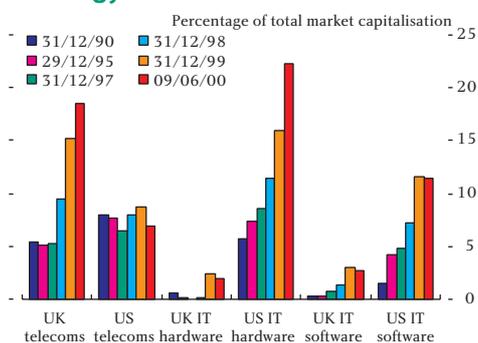
Source: Bloomberg.

**Chart 62:**  
Volume of put options on Nasdaq 100



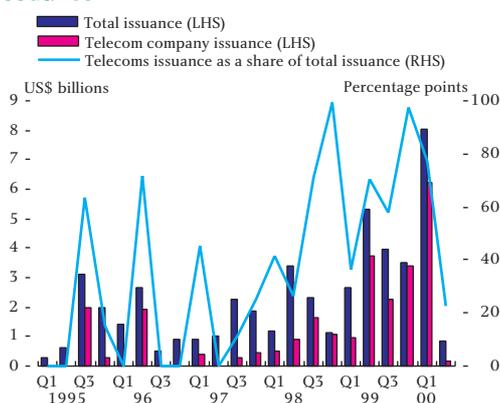
Source: Bloomberg.

**Chart 63:**  
Market capitalisation of telecoms and technology sectors



Source: Primark Datastream.

**Chart 64:**  
European sub-investment grade bond issuance<sup>(a)</sup>



Source: Capital Data.

(a) Issuance by borrowers resident in Europe. 2000 Q2 includes data up to 2 June.

### Debt markets: telecommunications

Although much public comment tends to look at technology stocks in the round, the sector is not a monolith (see Chart 63 for the relative importance of the telecoms and IT-related stocks in the UK and US equity markets).

Perhaps most significantly, the telecoms sector has for a while been a heavy issuer of debt – on both sides of the Atlantic and by both investment grade and sub-investment grade companies. In Europe, telecoms has accounted for well over half of total sub-investment grade issuance over the past year (Chart 64). Meanwhile, in the US domestic market, telecoms companies have accounted for over 70 per cent of sub-investment grade issuance so far in 2000, and represent nearly half the stock outstanding. Syndicated lending to telecoms companies has been heavy as well, forming nearly 30 per cent of the international syndicated loan market this year. So concentrations of lenders' exposure to this sector would seem to be rising.

What lies behind this is an enormous demand for capital to invest in a range of new telecoms technologies and markets, including third-generation mobile phone licences. The risk is that, against a background of profound change in the underlying fundamentals of the industry and a rapidly changing competitive environment, it might be difficult for lenders to assess, and price correctly, the longer-term credit exposures they are incurring.

These issues are currently much discussed in London and New York markets. In Europe, the relative price of credit to investment-grade telecoms companies – as evidenced by spreads over swap rates (Chart 65) – has risen this year, quite sharply since May, partly against the background of the high prices being realised in European government auctions of third-generation licences. It also appears to reflect some expected ratings downgradings as leverage increases.

New issuance of sub-investment grade telecoms bonds has in fact fallen sharply since March, as the fall in the price of TMT equities and lenders' existing heavy exposures to this sector seem to have reduced investor demand. In the euro-denominated market, credit spreads for telecoms debt have increased above other high-yield issues (Chart 66). If this persists, it is possible that companies may have to find other sources to meet cash needs.

### Fixed-income markets

When the November 1999 *Review* was prepared, a number of distortions were potentially affecting fixed-income markets and so measures of credit risk. The Bank commented<sup>24</sup> "precautionary behaviour by firms in the run-up to Y2K makes it more than usually difficult to assess the significance of an apparent increase in the volatility of corporate bond and swap spreads. It will only

<sup>24</sup> Editorial to November 1999 *Financial Stability Review*.

begin to become clear as we move into next year [2000] whether this is a transitory effect or whether, as market anecdote suggests, it reflects a more persistent withdrawal of risk capital.”

Concerns about liquidity in bond, swap and currency markets have, in fact, persisted. While liquidity has recovered from the immediate pre-millennium period, it remains lower than before the 1998 market turbulence. Contributory factors include less capital being deployed in these markets by market makers and other traders<sup>25</sup>.

Statistical data on liquidity in the bond and swap markets are difficult to obtain, but contacts frequently comment on the reduced willingness of market-makers to act as a ‘buffer’ for customers by absorbing large trades within their inventories. Larger institutional investor trades are more difficult for market makers to take onto their books directly, rather than being transacted as ‘worked orders’. The effects can be felt more immediately in prices and can add to the volatility, thus further reducing liquidity.

More generally, the increased volatility of markets, and the changing correlations between instruments, have led risk managers to place increasing emphasis on stress testing rather than value at risk (VaR) models as a measure of maximum potential loss; and to base stress tests on the assumption that many of the benefits of diversification can erode, or even disappear, during times of crisis. Nevertheless, there is a potential risk that the widespread use of VaR for day-to-day risk control could lead to material changes in prices if changes in historic correlations were to lead to similar portfolio adjustments across the market.

## Credit markets

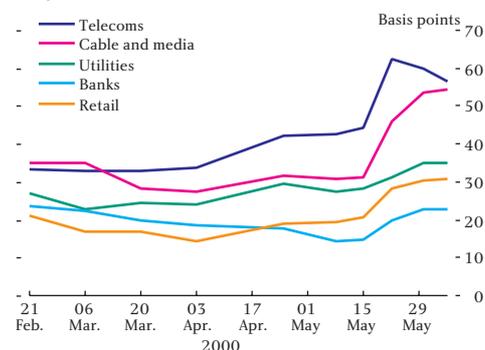
Since the smooth passage through the millennium date change, it has become clear that, in addition to some withdrawal of capital in the trading and market-making communities, there is another important influence on market conditions, especially in dollar and sterling markets: reduced current and prospective supply of government bonds. This has distorted credit spreads, complicated hedging, contributed to volatility (Chart 67), and provided part of the background to the debate in the market about the status of US agency debt, which has raised wider public policy concerns. Some of these issues are discussed in Boxes 4 and 5.

### Credit spreads

Reductions in the supply of government bonds, rather than market concern about credit risk, appears to have been a large factor behind the sharp rise in the spread of US corporate bond

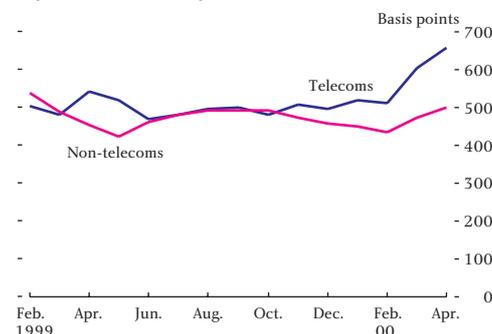
<sup>25</sup> In some markets, the reduction in liquidity has been particularly sharp, eg in the exchange-traded gilt options market, where the reduction in primary issuance of gilts has been accompanied by a reduction in options turnover during the period January–May 2000 to only 2 per cent of the level in the same period a year earlier.

**Chart 65:**  
European corporate bond spreads over swap rates



Source: Deutsche Bank.

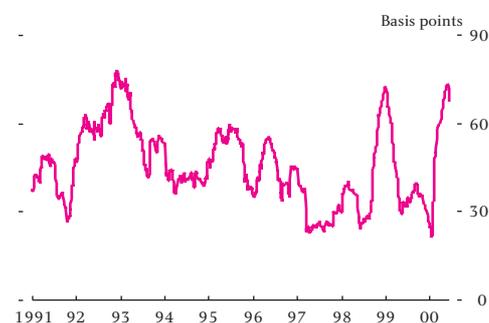
**Chart 66:**  
Euro-denominated sub-investment grade corporate bond spreads<sup>(a)</sup>



Source: Lehman Brothers.

<sup>(a)</sup> Option-adjusted spreads between corporate and government bonds.

**Chart 67:**  
Volatility of the spread between yields of 5-year and 30-year benchmark US Treasuries<sup>(a)</sup>



Source: Bloomberg.

<sup>(a)</sup> Volatility calculated as 91-day rolling annualised standard deviation of daily changes in the spread.

## Selected data on interest rate spreads

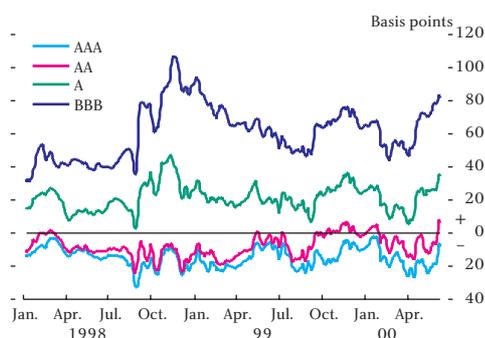
**Chart 68(a):**  
AA-rated corporate bond spreads over government bond yields<sup>(a)</sup>



Source: Bloomberg.

(a) Ten-year maturity fair market bond yields, industrial bonds for US, corporate bonds for UK and euro-area. Five-day moving average.

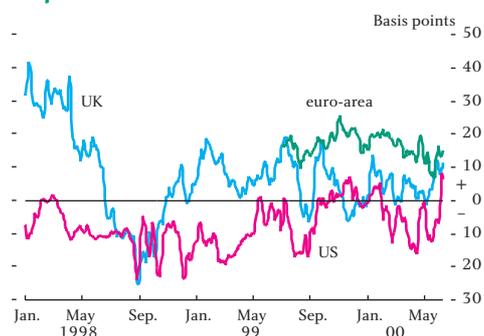
**Chart 68(d):**  
US industrial bond spreads over swap rates<sup>(a)</sup>



Source: Bloomberg.

(a) Ten-year maturity fair market bond yields less ten-year swap rates. Five-day moving average.

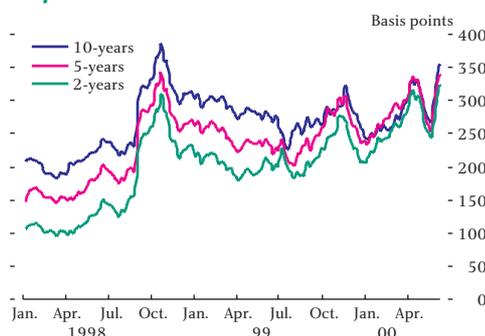
**Chart 68(b):**  
AA-rated corporate bond spreads over swap rates<sup>(a)</sup>



Source: Bloomberg.

(a) Ten-year maturity fair market bond yields (industrial bonds for the US, corporate bonds for UK and euro-area) less ten-year swap rates. Five-day moving average.

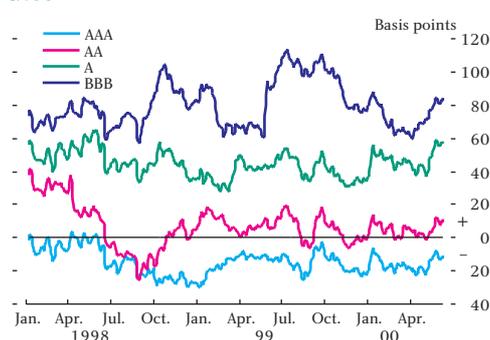
**Chart 68(e):**  
US B-rated industrial bond spreads over swap rates<sup>(a)</sup>



Source: Bloomberg.

(a) Fair market bond yields less maturity-matched swap rates. Five-day moving average.

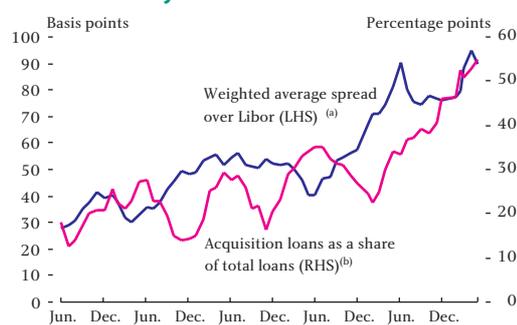
**Chart 68(c):**  
UK corporate bond spreads over swap rates<sup>(a)</sup>



Source: Bloomberg.

(a) Ten-year maturity fair market bond yields less ten-year swap rates. Five-day moving average.

**Chart 68(f):**  
International syndicated loan issuance



Source: Capital Data.

(a) Average spread over Libor of five-year maturity loans, weighted by size. Six-month moving average.

(b) Where use of proceeds is stated.

yields over US Treasury yields, which now exceed the levels reached during the autumn 1998 turbulence (Chart 68(a)).

For highly-rated borrowers, the pricing of credit risk as measured by spreads over swaps has not changed nearly so dramatically. For AA-rated issuers (Chart 68(b)), the yield spread over swaps has remained fairly stable since early 1999 in the United Kingdom, United States and the euro area, with, if anything, some decline since the beginning of the year. Spreads in the United Kingdom have widened slightly since April, perhaps influenced by uncertainty over whether the forthcoming MFR review could lead to increased corporate bond market issuance<sup>26</sup> or to a change in long maturity gilt yields.

For lower-rated investment-grade issuers (A to BBB), the widening of credit spreads towards the end of 1999, related to Y2K pressures, initially unwound in the early part of this year, as the liquidity premium reduced (Charts 68(c) and 68(d)). However, since April, equity market volatility and rising interest rates in an environment of increasing corporate leverage seem to have raised market doubts about the ability of firms to meet their future cash-flow obligations. This has led spreads to re-widen, with a greater tiering between different credit ratings. For shorter-dated debt of sub-investment grade issues in the United States, spreads are now around their levels during the 1998 Long Term Capital Management (LTCM) crisis (Chart 68(e)).

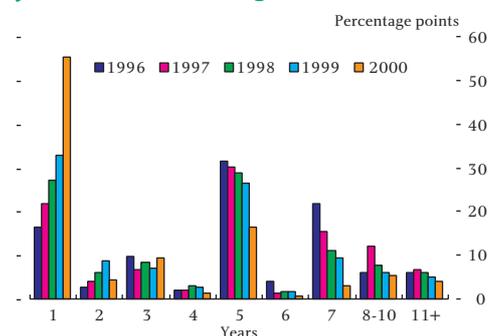
In the international syndicated loan market, the financing of acquisitions and other leveraged transactions has constituted an increasing proportion of the market in recent years. The rise in average spreads in this market has tended to reflect this rising proportion of large, leveraged transactions and a greater tiering of spreads for different levels of risk (Chart 68(f)).

The average maturity of loan facilities has fallen sharply in 1999 and 2000, with sub-one-year facilities being arranged both to finance large transactions and as bridges to capital market transactions (Chart 69). Individually, shortening the maturity of a loan arrangement is likely to reduce the credit risk. However, in aggregate the refinancing of this large number of short-term deals could become difficult if market conditions were to deteriorate.

#### Back-up lines of credit

In addition to on-balance sheet credit exposures, banks run large contingent exposures. During the autumn 1998 capital market turbulence, many firms drew down committed lines of credit provided by banks, including back-up lines to commercial paper programmes. At the time, some market participants in New York and London commented that facilities would be repriced.

**Chart 69:**  
Maturity breakdown of international syndicated loan arrangements<sup>(a)</sup>



Source: Capital Data.

(a) Percentage of new arrangements for which a maturity date was given.

<sup>26</sup> The relationship between pension fund behaviour, the Minimum Funding Requirement (MFR) and bond yields was discussed in the previous *Review*, p. 87.

## Box 4: Questions posed by shrinking government bond markets

Current and prospective government bond market supply is falling in a number of countries, including the United Kingdom and, most notably, in the United States, where official projections suggest complete repayment of the debt by 2013<sup>1</sup>. In Japan, meanwhile, government debt is increasing. Shrinking government bond markets have a number of potential implications for markets generally that could be relevant to financial stability and which warrant study by market participants and the authorities:

- There has been greater volatility in government bond markets. That tends to increase risk (as measured, for example, by Value-at-Risk), which may in turn increase the capital needed for trading books, and so potentially reduce the size of market maker positions and hence liquidity. This is not a vicious spiral but rather a possible new equilibrium of lower liquidity and higher volatility.
- Partly reflecting greater volatility in spreads, government bonds have recently become less effective hedges for other instruments, such as corporate bonds (see Chart F in the Overview). The adequacy of swaps as another potential hedge will depend on the stability of correlations between non-bank corporate risk and bank risk reflected in swap rates. Also, in contrast to using government bonds, hedging via swaps requires a series of new positions which entail counterparty credit risk. This might, therefore, add to interest in mechanisms for netting swap positions; the London Clearing House has recently introduced Swapclear, which enables multilateral netting.
- Similarly, distortions to government bond yield curves have impaired their role as a risk-free benchmark for pricing. In consequence, issuers of long-dated bonds have been exploring alternatives, such as swap rates, which are in fact an imperfect measure of the risk-free rate, especially if the perceived credit risk of the Libor panel banks is variable.
- More fundamentally, reduced supply of the credit risk-free asset constrains portfolio choices, so that some investors may end up exposed to more risk than they would choose. Related to this, the increased supply of, for example, Japanese Government Bonds and US agencies (Box 5) relative to US Treasuries is affecting the benchmarks against which the performance of some institutional investors is assessed. That could potentially distort investor behaviour, and may require review of how some benchmarks are constructed.
- If government bond supply were to be substantially reduced – as might occur in, for example, the US – this would over time reduce the availability of high quality collateral, which is used to cover credit exposures between market counterparties and in payment systems. Lower quality collateral would require larger ‘haircuts’.
- Similarly, any such substantial reduction in the stock of government debt would reduce the supply of the highest quality liquid assets held by banks and other financial intermediaries; and could potentially over time impair the ability to sell or repo-out government bonds in the event of funding strains. There are, though, no obvious signs of liquidity management having already been materially constrained. Some central banks, including the Bank of England, have extended the instruments accepted in open market operations to include overseas government paper<sup>2</sup>. In consequence, the Financial Services Authority has made a similar extension to the range of assets which the major banks can hold as ‘stock liquidity’.

It is too early to judge how material these issues could become and whether market solutions would prove to be available.

1: See Table 12-2 in Analytical Perspectives, Budget of the US Government, Fiscal Year 2001: <http://w3.access.gpo.gov/usbudget/fy2001/pdf/spec.pdf>.

2: See Bank of England notice on eligible collateral, 30 July 1999: [www.bankofengland.co.uk/pr99063.htm](http://www.bankofengland.co.uk/pr99063.htm).

Anecdote suggests, however, that this has not happened. Some market contacts observe that this reflects strong competitive pressures to offer cheap back-up lines as part of a wider financial relationship. Such liquidity insurance is provided by some investment banks as well as commercial banks.

The risks incurred in the event of drawdown vary according to whether a particular company is experiencing credit, and therefore market access, difficulties; or whether, reflecting widespread market stress, companies generally cannot access alternative capital market sources of funding, so that a number of drawdowns occur simultaneously. In the latter case, bank providers need to be able to manage any liquidity impact as well as the increase in on-balance sheet credit exposure. It is important that bank risk managers, and regulators, take this into account. The proposal of the Basel Committee on Banking Supervision to apply a credit conversion factor of 20 per cent, rather than zero, to 365-day (or below) facilities for regulatory capital purposes is very welcome.

## Hedge funds

### *Bank risk management*

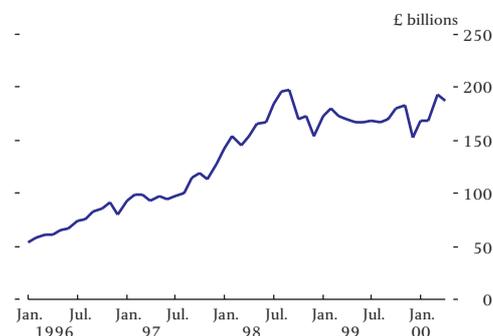
Since the LTCM episode, there has been much discussion – in official and market circles – about the quality of banks’ control of their credit exposures to hedge funds<sup>27</sup>. In January, the Basel Committee on Banking Supervision (BCBS) published a review<sup>28</sup> of the extent to which the various sound practices recommended in its 1999 report<sup>29</sup> had been implemented. Overall, the Committee concluded that progress had been made with respect to banks’ awareness of the potential risks in dealing with highly leveraged institutions (HLIs), reflected to varying degrees in improvements in information gathering, due diligence and credit analysis of HLIs, and in collateral management. Nevertheless, the report noted the slow progress that had been made on difficult technical issues such as the measurement of potential future exposure, the valuation of collateral under different liquidity conditions, and stress testing. In January, the BCBS and the International Organisation of Securities Commissions (IOSCO) announced the setting up of a joint working party to monitor financial firms’ progress in improving risk management processes with respect to their dealings with HLIs.

<sup>27</sup>: For an overview of the many initiatives on this front, see ‘Report of the Working Group on Highly Leveraged Institutions’, chaired by Howard Davies, Chairman of the UK Financial Services Authority, Financial Stability Forum, April 2000 [www.fsforum.org/Reports/RepHLL.pdf](http://www.fsforum.org/Reports/RepHLL.pdf)

<sup>28</sup>: ‘Banks’ Interactions with Highly Leveraged Institutions: Implementation of the Basel Committee’s Sound Practices Paper’, Basel Committee on Banking Supervision, January 2000: [www.bis.org/publ/index.htm](http://www.bis.org/publ/index.htm)

<sup>29</sup>: ‘Sound Practices for Banks’ Interactions with Highly Leveraged Institutions’, Basel Committee on Banking Supervision, January 1999: [www.bis.org/publ/index.htm](http://www.bis.org/publ/index.htm)

**Chart 70:**  
Reverse repo lending to non-residents by UK banks



Source: Bank of England.

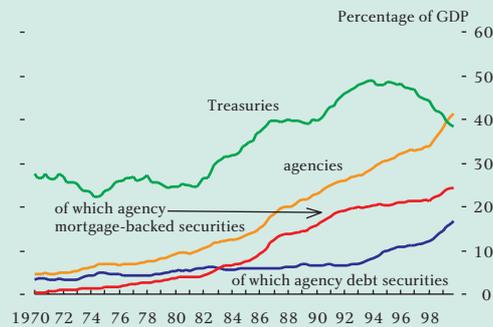
## Box 5: US government-sponsored enterprises

US government-sponsored enterprises (GSEs, or 'agencies'), finance – among other things – residential mortgages, student loans and farm credit. The largest are the Federal National Mortgage Association (Fannie Mae), the Federal Home Loan Mortgage Corporation (Freddie Mac), and the Federal Home Loan Banks (FHLB).

Despite their names, they are not directly associated with the US government. Rather, they are private, shareholder-owned, profit-maximising companies operating under federal charter. In addition to having Congressional mandates, they do however enjoy certain privileges. For example, Fannie Mae and Freddie Mac each have a credit line of US\$2.25 billion at the option of the Treasury; they do not pay state and local corporate income tax; and US bank holdings of GSE debt securities are not subject to the usual 10 per cent of capital regulatory concentration limits. Against this background, the market seems to have developed a belief that the GSEs are somehow backed by the US government, notwithstanding that every GSE debt security states that they "are not guaranteed by the United States and do not constitute a debt or obligation of the United States"<sup>1</sup>.

Those GSEs which operate in the secondary residential mortgage market lower the cost of home buying by securitising existing mortgages and by issuing their own debt securities. In doing so, GSEs have benefited from funding themselves cheaply because of the perceived government backing. In fact, in 1997 Fannie Mae and Freddie Mac were given a 'risk to government' rating of AA-, but continued to be rated AAA as 'risk to investors', by the rating agency Standard & Poor's. Since then they have significantly increased their on- and off-balance sheet activities (see Chart A). GSEs such as Fannie Mae and Freddie Mac have become the dominant institutions in the US secondary mortgage market and constitute an increasing percentage of overall US dollar credit markets.

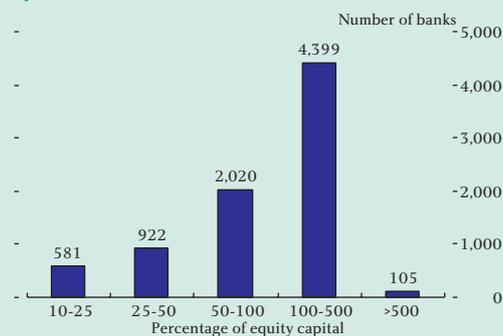
**Chart A:**  
US Treasury and agency securities



Source: Board of Governors of the Federal Reserve System: 'Flow of Funds Accounts of the United States', 2000 Q1. Data at par value.

More than 87 per cent of banks surveyed by the American Bankers' Association held GSE debt in excess of 10 per cent of their capital as at end-1999. For close to half of them, the exposure exceeded 100 per cent of capital (see Chart B).

**Chart B:**  
Exposure of US banks to GSE debt



Source: American Bankers' Association.

Large exposures were concentrated amongst small banks: more than half of the banks with an exposure of more than 10 per cent had assets of less than US\$100 million. Other holders of GSE securities include overseas investors (see Table A).

In order to match the duration of balance sheet assets and liabilities, GSEs enter into derivative contracts. Together, Fannie Mae and Freddie Mac have a large presence in the derivatives market; anecdote suggests that they are amongst the largest participants in the dollar interest-rate swap market, and they undertake swaps of their 'own' rates against Libor as well as

<sup>1</sup> The confusion sometimes seems to affect official documents and policies. For example, peculiarly, the GSEs are treated as part of the 20 per cent-weighted public sector in US bank regulators' implementation of the 1988 Basel Capital Accord; and the US Flow of Funds statistical release includes GSE liabilities as US government securities.

**Table A: Selected holders of US agency securities**

Per cent of total	1980	1990	1995	1998	1999
Household sector	1.9	4.6	5.1	4.9	8.0
Commercial banks	21.5	10.4	6.3	4.8	4.3
Private pension funds	3.0	3.5	6.4	9.1	10.1
State and local governments	22.2	19.7	19.4	20.0	17.9
Government-sponsored enterprises	6.6	10.5	11.1	10.4	9.4
Rest of the world	0.3	0.8	7.7	13.3	15.0

Source: Board of Governors of the Federal Reserve System (*op cit*)

Treasury bond rates against Libor. The notional amount outstanding of their derivatives was equal to US\$563 billion as at 31 December 1999. The market does not usually collect margin from them, reflecting their perceived credit standing.

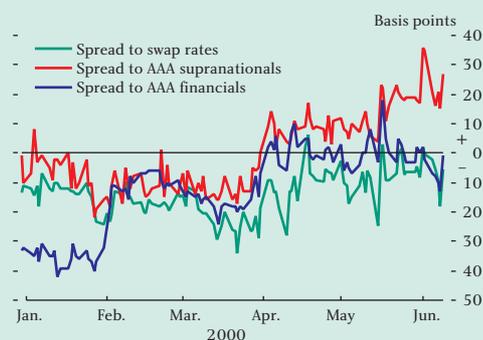
Since the Federal Housing Enterprise Safety and Soundness Act of 1992, oversight of the financial robustness of Fannie Mae and Freddie Mac has been the responsibility of the Office of Federal Housing Enterprise Oversight (OFHEO). In his testimony to the US House of Representatives on GSEs on 16 May of this year, Fannie Mae's Chairman and CEO stated that "No other financial institution is subject to as detailed or rigorous a capital standard as the one imposed on Fannie Mae and Freddie Mac by the 1992 Act". OFHEO has not yet introduced a risk-based capital standard.

Legislation currently before US Congress seeks to address the hitherto ambiguous nature of the GSEs and the wider economic implications of the subsidy they enjoy<sup>2</sup>. In testimony to the US House of Representatives on GSEs on 22 March, US Treasury Under Secretary Gensler remarked that "as the GSEs continue to grow and to play an increasingly central role in the capital markets, issues of potential systemic risk and market competition become more relevant".

These comments led to a partial re-assessment of the relative riskiness of GSE debt, and of the increasing use of GSE debt securities as a substitute for the

shrinking supply of US Treasury bonds<sup>3</sup>. As a result, spreads between GSE securities and swaps – as well as Treasuries – widened. Their yields also now exceed that of AAA-rated supranational issuers (see Chart C). It is unclear whether or not the current spreads are an equilibrium.

**Chart C:**  
Spread of agency securities to swaps, and to AAA bonds<sup>(a)</sup>



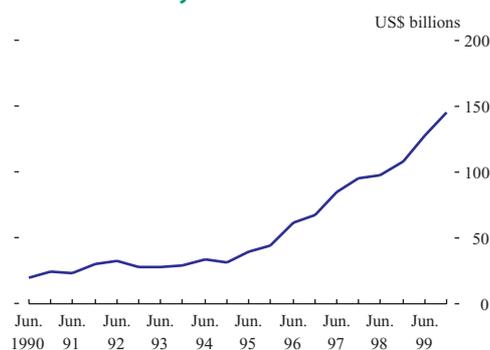
Source: Bloomberg.

(a) Ten-year maturity. All curves are fair market curves, except for swap rates.

<sup>2</sup>: See the letter by Federal Reserve Chairman Greenspan to the Chairman of the House of Representatives Subcommittee on Capital Markets, Securities and Government Sponsored Enterprises, subsequently released to the public: [www.house.gov/banking/5230obak.htm](http://www.house.gov/banking/5230obak.htm).

<sup>3</sup>: Regular benchmark issuance programmes have been introduced by Fannie Mae and Freddie Mac. The Chicago Mercantile Exchange and the Chicago Board of Trade both recently introduced futures contracts on the securities (their first futures on private sector securities).

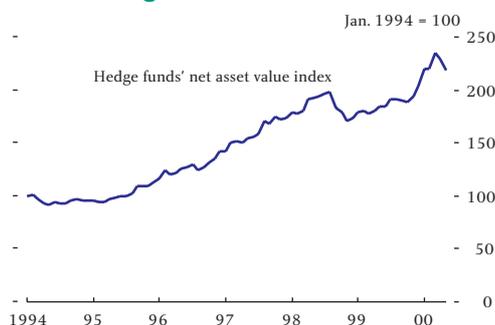
**Chart 71:**  
**Bank lending to the non-bank private sector in the Cayman Islands<sup>(a)</sup>**



Source: BIS.

(a) Cross-border lending by BIS reporting banks. Total lending to the Cayman Islands during both 1999 H1 and H2 was \$197 billion, but when lending is adjusted for risk transfer to the country of ultimate risk, lending to the Cayman Islands falls to \$150 billion and \$167 billion for the same periods. Adjustments for risk transfer are not available for individual economic sectors.

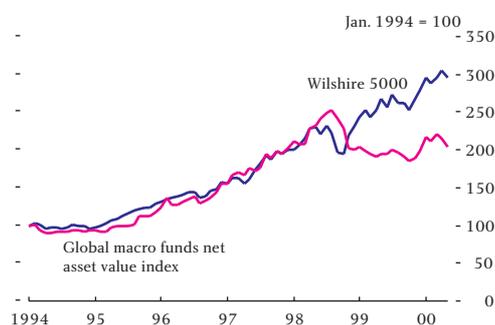
**Chart 72:**  
**Index of hedge fund net asset value<sup>(a)</sup>**



Source: CSFB/Tremont.

(a) Funds reporting to the CSFB/Tremont index.

**Chart 73:**  
**Index of global macro fund net asset value<sup>(a)</sup>**



Sources: CSFB/Tremont and Primark Datastream.

(a) Funds reporting to the CSFB/Tremont index.

The Bank of England's own market intelligence suggests that major investment and commercial banks are probably now seeking and generally receiving more information, but that they have probably not tightened their requirements for initial margin (or haircuts) for the larger hedge funds, so that in principle the funds might still be able to achieve high levels of leverage.

#### *Hedge fund leverage and strategy changes*

Although there is little published information on hedge fund leverage, various possible indicators can be derived from data on the banking sector's financing of customer activities. One is bank lending via reverse repo to overseas residents. Another is BIS-area bank lending to entities in those offshore financial centres where many hedge funds are legally based. The marked rise over 1997 and 1998 in UK banks' reverse repo lending to non-residents (Chart 70) and in BIS-area bank lending to Cayman Island residents (Chart 71) are, for example, suggestive (perhaps with the benefit of hindsight) of accumulating borrowing by overseas and, in particular, by offshore wholesale market counterparties. Following a sharp decline in 1998 Q4, UK banks' foreign currency reverse repo with non-residents had returned to around pre-LTCM levels by end-1999. But these indicators could never be more than 'amber lights', triggering further inquiry if they seem interesting. (For example, many special purpose vehicles established by commercial and investment banks are also based in offshore countries, and their borrowing might affect the BIS data.)

In contrast to what seems to be suggested by bank lending data, anecdote suggests that, following LTCM, hedge funds have preferred lower levels of leverage. While the value of assets managed by hedge funds is now higher than pre-LTCM (Chart 72), 'macro' investment styles have become less popular (Chart 73). Trading strategies are generally reported as having switched from currency and interest rate markets to equity markets – focused more on stock picking, investment in high technology stocks, or M&A bets. The same degree of market risk can be taken on at much lower levels of leverage in these markets (and thus possibly – although not certainly – with a smaller risk of large spillovers in the event of large losses). Indeed, two of the largest groups recently closed or changed course without causing wider market disruption. Soros Fund Management and Tiger Management respectively announced major structural changes and closure earlier this year following heavy losses. The Soros losses reflected the volatility of technology shares in April; Tiger, on the other hand, did not have large positions in technology stocks and had 'missed out' on the sharp price increases early this year. This is another facet of the extent to which recent months have been dominated by equity market developments.

## IV The UK corporate and household sectors

Economic growth in the UK in 1999 markedly exceeded forecasts made in 1998, and bankers have commented that, in general, conditions have been better than they expected. The external forecasters polled by the Bank for the May 2000 *Inflation Report* revised their projections for GDP growth in the year to 2000 Q4 to an average of 3 per cent, compared with 2<sup>3</sup>/<sub>4</sub> per cent in February. Against that background, the mean forecast for the official interest rate in 2000 Q4 was broadly unchanged, so the income gearing of households and firms together may be lower this year than lenders and borrowers expected in February.

However, stability of exchange rates and market interest rates at a time of generally weak net trade and strong domestic demand is not assured, and, as the Bank of England's Monetary Policy Committee commented at its May meeting, sterling had been at levels against the euro that were unlikely to be sustained. Indeed, the effective exchange rate index has fallen about 8 per cent since it peaked on 3 May, which may alleviate pressures on internationally exposed firms.

Perceptions of sterling volatility implied by option prices suggest that the degree of uncertainty about its rate against the euro has recently increased (Chart 3). Lenders' and borrowers' decisions are also complicated by the uncertainty created by structural change, much of it associated with IT. This section considers the resilience of the corporate and household sectors in the UK in this environment.

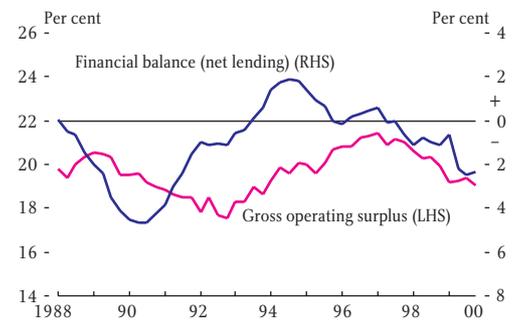
### The corporate sector

While the gross operating surplus stabilised, the financial balance of UK private non-financial companies (PNFCs) continued to decline during 1999 before improving slightly at the beginning of this year (Chart 74). The prolonged weakness of the euro against sterling is likely to have been one of the reasons. Chart 75 shows just how much the pound rose against the eleven euro-area currencies from 1996 to 1998, and then from the launch of the euro itself; the trade-weighted exchange rate index (ERI) has moved similarly.

#### Variation in performance across firms

Given the exchange rate appreciation over the past few years (relieved a little by sterling's recent fall), it is not surprising that prospects for some firms in tradable sectors have suffered, and that is reflected in the differing rates of investment in manufacturing and services (Chart 76). The percentage of value added that is dependent on exports is estimated by National Statistics at around 44 per cent for manufacturing and 20 per cent for private services<sup>30</sup>. Chart 77 shows a similar divergence in

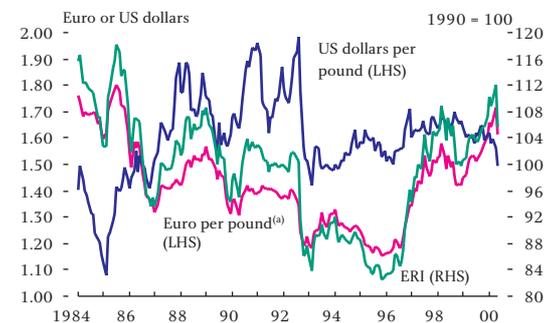
**Chart 74:**  
**PNFCs' profits and financial surplus<sup>(a)</sup>**



Source: National Statistics (previously Office for National Statistics(ONS)).

(a) Figures for private non-financial corporations as a percentage of GDP. Gross operating surplus data are quarterly, and seasonally adjusted. Financial balance data show a four-quarter moving average.

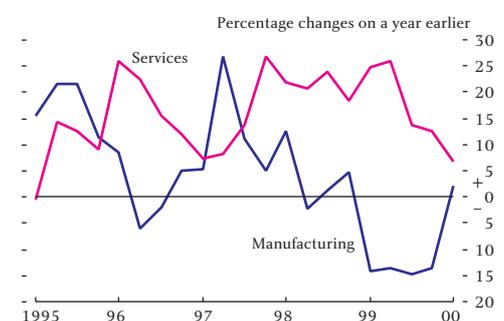
**Chart 75:**  
**Selected sterling exchange rates<sup>(a)</sup>**



Source: Bank of England.

(a) Rates before 1 January 1999 are calculated as a synthetic euro exchange rate based on a weighted average of the component currencies.

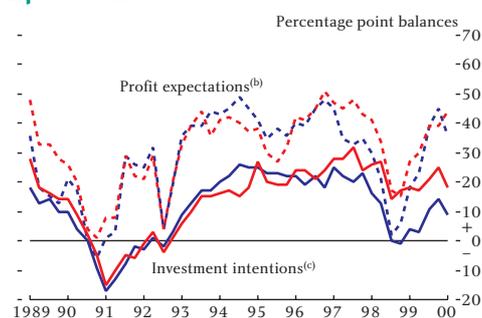
**Chart 76:**  
**Growth in investment**



Source: National Statistics (previously Office for National Statistics (ONS)).

<sup>30</sup>: Input-Output Supply and Use Balances, 1992-96, National Statistics. Based on 1990 data.

**Chart 77:**  
Investment intentions and profit expectations<sup>(a)</sup>



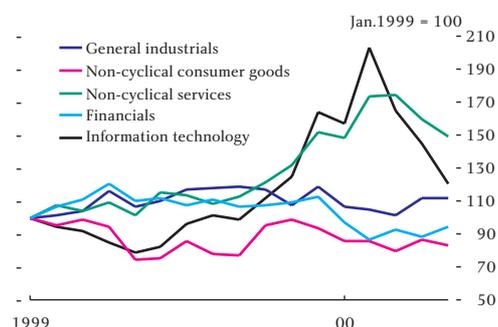
Source: British Chambers of Commerce.

(a) Manufacturing sector responses shown in blue, service sector responses shown in red.

(b) Balance of responses to the question: 'Do you believe that over the next 12 months profitability will improve/remain the same/worsen?'

(c) Balance of responses to the question: 'Over the past three months, which changes have you made in your investment plans for plant and machinery: Revise upwards/no change/revise downwards?'

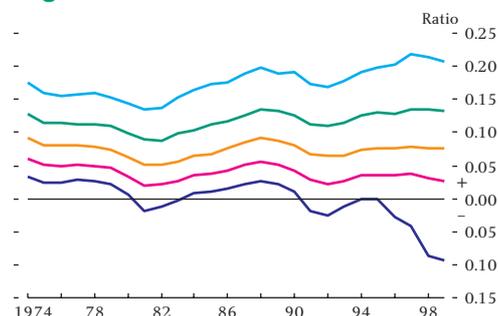
**Chart 78:**  
Selected sectoral P/E ratios<sup>(a)</sup>



Source: Primark Datastream.

(a) End-month data.

**Chart 79:**  
Percentiles of distribution of profit margins<sup>(a)</sup>



Sources: Bank of England and Primark Datastream.

(a) As defined by profit before interest and tax divided by total sales. Percentiles are, from top to bottom, 90th, 75th, 50th, 25th, 10th.

investment intentions, but little difference in profit expectations, which are still quite buoyant for the corporate sector as a whole.

Over the past year, there has been considerable variation in the performance of sectors of the FTSE All-Share Index (Chart 78; see also Section III). There does not appear to be any single common factor amongst the underperformers. Dependence on exports is not the whole story. Several retailers have reported very poor results, yet the sector as a whole is not the worst performing. Nor is it likely that the oil price rise since the November Review is the sole cause. The apparent inability of some firms selling mainly in the domestic market to benefit from lower import prices (for example, due to increased domestic competition) suggests that their profitability may be vulnerable to falls in sterling against the euro, benefiting exporters but increasing import costs.

Analysing company data can throw further light on profitability across both exporting and domestically oriented sectors. The distribution of operating profit margins across firms diverged considerably in the 1990s (Chart 79). In particular, there was a sharp fall in profit margins at the tenth percentile, in the corporate sector as a whole and in both the services and non-services (production) sectors. The Euler Trade Indemnity Survey<sup>31</sup> confirms that the exchange rate has had a negative impact since 1997 on profitability in manufacturing, whereas in services it has been broadly neutral. But it also reveals that in services and – until 1999 Q4 – manufacturing, firms have placed more emphasis on the adverse impact of price discounting and a more competitive environment.

#### Company gearing

There is some evidence that company gearing has been increasing. In part, that may reflect the withdrawal of tax credits on dividends from 1997, which increased the cost of equity relative to debt. Chart 80 shows three measures of gearing of firms. Interest payments as a proportion of pre-tax profits have risen a little since 1997, and are now higher than during the economic expansion of the mid-80s – although still not far off historical lows. Net debt as a proportion of the capital stock at replacement cost – a measure of capital gearing – has increased since a year ago, and capital gearing on both the replacement cost and market value measures is higher than in the 1980s boom. Neither replacement cost nor market value is an ideal proxy for the value of firms' collateral in the event of financial distress; in particular, the latter is vulnerable to any stock market correction.

The article by Benito and Vlieghe in this issue<sup>32</sup> concludes that a subgroup of highly geared companies has rapidly increased its

<sup>31</sup>: Published 17 April.

<sup>32</sup>: Benito, A and Vlieghe, G, 'Stylised facts on UK corporate financial health: evidence from micro-data,' pp. 83-93.

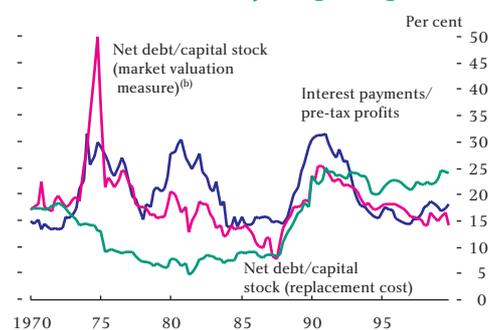
gearing in recent years. This is supported by a recent Close Brothers Corporate Finance survey of some 'mid cap' stocks, in the FTSE 350 but outside the top 100. The survey shows a marked shift from 1997 to 1999 in capital gearing, with the ratio of net debt to equity (and minority interests) more than doubling, from 25 per cent to 53 per cent. It suggests that interest cover (the ratio of earnings to interest payable) has been declining in recent years in most sectors. These companies' exposure to rises in interest rates would therefore seem to have increased.

One measure of corporate sector exposure to the risk of a change in credit conditions is the extent to which companies are relying on external sources rather than internally generated funds to finance investment and the acquisition of assets generally. There is typically a wedge between the cost of internal and external funds – the external finance premium – because external creditors usually know less than managers about the likely returns on firms' proposed projects. As companies rely increasingly on external funds, the cost of capital is raised, other things being equal. Moreover, the external finance premium is likely to increase when companies are at their most vulnerable, because potential lenders can take a lack of internal funding as a signal of poor prospects or lack of managerial conviction. That causes firms to be affected more than otherwise by increases in interest rates – the so-called financial accelerator effect<sup>33</sup>. The ratio of gross saving to total financing – a measure of internal financing – fell during the second half of the 1980s (Chart 81), reflecting rapid growth in business investment relative to gross saving, and reached a low in 1990, just as the corporate sector's vulnerability to high interest rates and recession was becoming evident. It recovered as firms cut back investment and attempted to repair their balance sheets, but has declined again since 1994, and fell sharply last year, mostly as a result of a large increase in external financing to acquire foreign equities.

#### Measures of financial distress

Direct evidence about the financial fragility of firms is mixed. Profit warnings recorded by Reuters have continued to fall since autumn 1998 (Chart 82), and the rate of company insolvencies fell further in the first quarter of 2000. Similarly, the April Euler Trade Indemnity survey indicated that the incidence of bad debts and business failures fell in 1999 Q4 by 8 per cent on the quarter, and was 15 per cent lower than a year earlier. Figures from the Department of Trade and Industry on receiverships indicate that company voluntary arrangements, receivership and administrator appointments increased by 2.6 per cent in 2000 Q1<sup>34</sup>, following a

**Chart 80:**  
**PNFCs' income and capital gearing<sup>(a)</sup>**



Source: National Statistics (previously Office for National Statistics (ONS)).

(a) Data are seasonally adjusted.

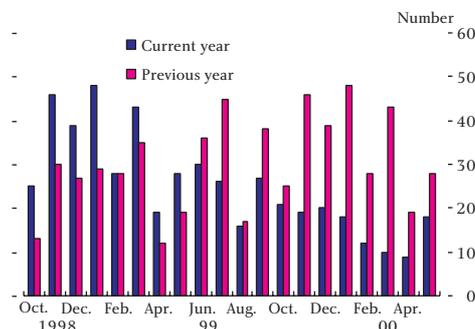
(b) PNFCs' net debt divided by the sum of the net debt and market value of equity.

**Chart 81:**  
**PNFCs' gross saving as a percentage of PNFC financial flows**



Source: National Statistics (previously Office for National Statistics (ONS)).

**Chart 82:**  
**Profit warnings by UK companies**

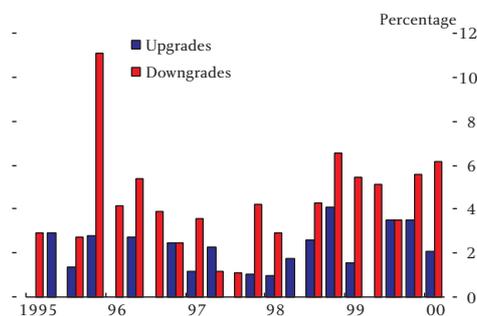


Sources: Reuters and Bank of England.

<sup>33</sup>: Bernanke, B, Gertler, M and Gilchrist, S (2000), 'The financial accelerator in a quantitative business cycle framework,' in Taylor, JB and Woodford, M (Eds): 'Handbook of Macroeconomics', Amsterdam, North-Holland.

<sup>34</sup>: Provisional figures, not seasonally adjusted; DTI Statistical Press Release, 5 May.

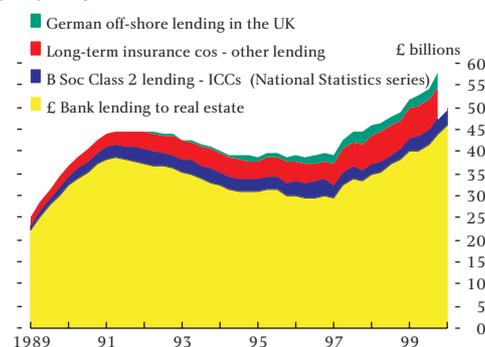
**Chart 83:**  
**Quarterly rating changes for UK non-financial issuers<sup>(a)</sup>**



Source: Moody's Investors Service.

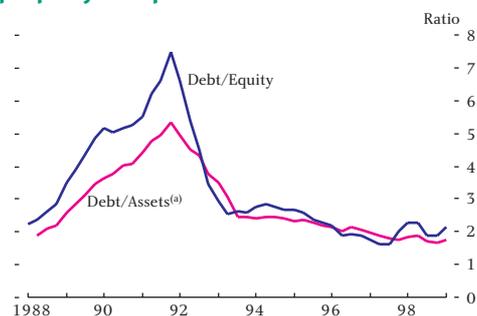
(a) Upgrades and downgrades as a percentage of number of companies rated.

**Chart 84:**  
**Bank and non-bank lending to commercial property**



Sources: Bank of England, German Bankers Association and National Statistics (previously Office for National Statistics (ONS)).

**Chart 85:**  
**Ratio of total lending to commercial property to the market value of UK property companies**



Sources: National Statistics (previously Office for National Statistics (ONS)), Bank of England, German Bankers Association, DTZ Tie Leung and Primark Datastream.

(a) The market value of the assets was calculated adjusting the equity value for brokers' estimates of the Net Asset Value Discount.

much larger increase of 16 per cent in the previous quarter. Figures from KPMG on receiverships in 2000 Q1 were 10.2 per cent lower than a year previously, but 5 per cent higher than in 1999 Q4.

In the past four quarters, the number of downgradings by Moody's of corporate bonds issued by UK companies (Chart 83) has increased. One possible explanation is creditor concerns about the heavy debts being taken on by some firms to finance mergers, takeovers and, in the case of telecoms, purchases of licences (see Section III). Rating agencies may also be reviewing firms more frequently in the wake of the 1998 disruption of world financial markets.

### The property sector

Evidence from early 2000 suggests that potential risks to financial stability arising from lending to commercial property remain low. Demand is strong and expected to continue so: office vacancy rates in London, for example, are still low. Development in progress is subdued. Total returns are still rising modestly. While total lending to the sector continues to increase (Chart 84), recent meetings of the Property Forum<sup>35</sup>, as well as FPD Savills<sup>36</sup>, have noted that this is almost entirely for developments at least half of which are pre-let. Participants at the Forum commented that there was little evidence of major UK commercial banks funding speculative development, although UK institutional investors did appear to be taking equity stakes in some such schemes. Chart 85 shows two measures of the gearing of property companies. Not all lending to the commercial property sector is to these companies, but the time series does indicate that borrowing, measured against the value of both equity and the underlying property assets, has been stable recently.

### The household sector

Figures published since the November *Review* by National Statistics show that the balance sheet of the UK household sector strengthened over the second half of 1999 (Table 14), reflecting marked increases in both house and equity prices. But households' debt is close to record levels relative to their disposable income.

#### Borrowing

Although the repo rate has increased by a full 1 per cent (to 6 per cent) over the past year, that has not been fully reflected in mortgage rates charged to borrowers. Bank mortgage spreads over Libor have narrowed as market interest rates have risen (Chart 107). For new borrowers, the Council of Mortgage

<sup>35</sup>: See the November *Review*, p72; most recently 26 April.

<sup>36</sup>: Annual breakfast presentation 24 May.

**Table 14: Aggregate balance sheet of the household sector<sup>(a)</sup>**

£ billions

	1999 Q2	1999 Q4	Percentage increase
<b>Total assets</b>	4,473.6	4,694.3	4.9
of which:			
Housing wealth <sup>(b)</sup>	1,654.6	1,784.5	7.9
Total financial assets	2,819.0	2,909.8	3.2
of which:			
Deposits	587.0	602.9	2.7
Bonds and long-term loans	54.6	51.5	-5.7
Equities	613.0	662.5	8.1
Indirect wealth <sup>(c)</sup>	1,492.2	1,520.7	1.9
<b>Total liabilities<sup>(d)</sup></b>	651.3	680.9	4.5
of which:			
Total loans secured on dwellings	471.9	491.2	4.1
Consumer credit	108.3	115.2	6.4
<b>Net worth</b>	3,822.3	4,013.4	5.0

Source: National Statistics (previously Office for National Statistics (ONS)).

(a) Data include non-profit institutions.

(b) Uses Bank of England's estimate of housing wealth.

(c) Indirect holdings of households' net equity in life assurance and pension funds.

(d) Excludes other accounts receivable/payable, prepayments of insurance premia and other long-term loans.

Lenders estimates that the average rate paid had increased by only 0.68 per cent between June 1999 and May of this year. In the case of unsecured loans, the difference between lending rates and the repo rate has similarly narrowed significantly over the past year, so personal borrowers have been cushioned to some extent from the impact of monetary tightening.

The rate of growth of households' borrowing from banks and building societies as a proportion of disposable income has stabilised at an annual rate of around 2 per cent since the second half of 1998, following a sharp increase (Chart 86). Much new borrowing last year took the form of mortgage equity withdrawal (Chart 87), defined here as new borrowing secured on, but not invested in, the housing stock. Developments in the mortgage market have allowed more households access to relatively cheap funds, potentially reducing income gearing. The nominal interest cost of servicing both unsecured and mortgage borrowing is well below the level of the late 1980s (Chart 88). It is expected to remain moderate, judging by current market expectations about the path of nominal interest rates; Chart 89 shows the sensitivity of income gearing to interest rate outcomes above or below the market's central expectation (holding the debt-income ratio constant at its 1999 Q4 level). The proportions of mortgages in arrears and possessions have both continued to fall, although the number of personal bankruptcies

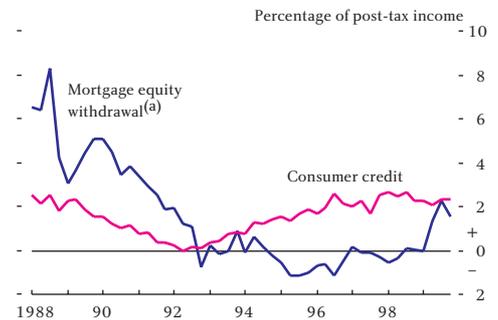
**Chart 86: Household M4 lending/income annual growth<sup>(a)</sup>**



Source: Bank of England.

(a) Post-tax household income.

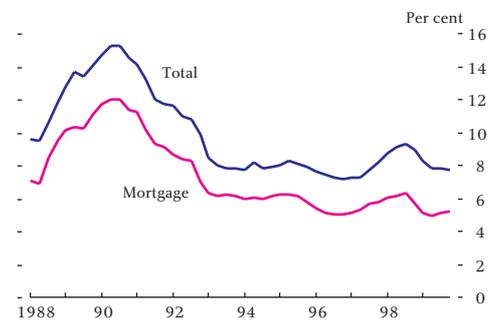
**Chart 87: Mortgage equity withdrawal and consumer credit flows**



Sources: Bank of England and National Statistics (previously Office for National Statistics (ONS)).

(a) New borrowing secured on housing that is not invested in the housing stock.

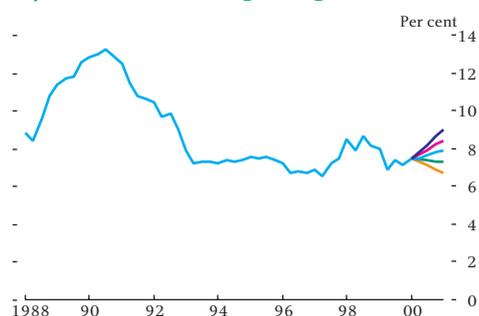
**Chart 88: Household sector income gearing<sup>(a)</sup>**



Sources: Bank of England and National Statistics (previously Office for National Statistics (ONS)).

(a) Gross interest payments as a proportion of personal disposable income. Data are seasonally adjusted.

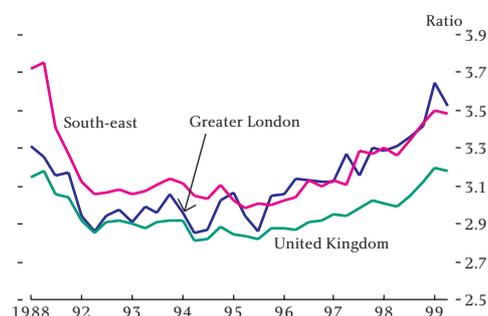
**Chart 89:**  
**Projection of income gearing measure<sup>(a)</sup>**



Source: Bank of England and National Statistics (previously Office for National Statistics (ONS)).

(a) Central projection implied by short-sterling futures contracts, and interest rate variants corresponding to +/- 1 and 2 standard deviations derived from options on those contracts.

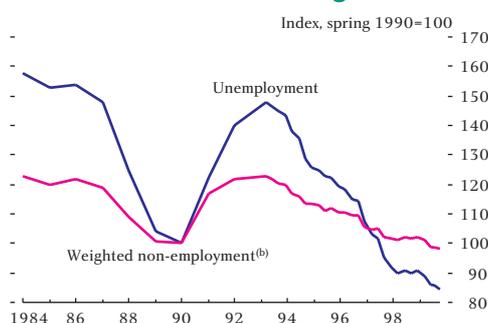
**Chart 90:**  
**Average house price to disposable income ratio<sup>(a)</sup>**



Source: Council of Mortgage Lenders.

(a) Data prior to 1993 are for Building Societies only, and are annual. Thereafter they are for all lenders and are quarterly. Income is the average income of borrowers.

**Chart 91:**  
**Measures of labour market tightness<sup>(a)</sup>**



Sources: National Statistics (previously Office for National Statistics (ONS)) and Bank of England.

(a) Pre-1993 figures based on yearly observations.

(b) The weighted non-employment series is a weighted average of the number of people in each of seven different categories of non-employment. The weights are based on the average proportion in each category who found employment in the next three months, relative to the proportion of the short-term unemployed who found employment in the next three months.

has been increasing slightly since reaching its low point of recent years, in mid-1997.

#### *Potential threats to households' finances*

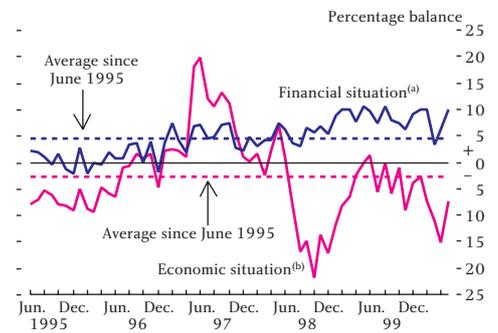
In the late 1980s, the financial position of the household sector was hit by two surprises. The first was higher-than-expected interest rates, and hence a greater cost of servicing debt. The second was the combination of a downturn in GDP growth, a significant increase in unemployment, a fall in nominal house prices, and negative equity for borrowers with high loan-to-value (LTV) ratios. At the moment, average LTVs seem to be falling, to a surprising extent for first-time buyers (see Section V). If so, their initial equity stakes provide a bigger cushion against a possible fall in house prices than at the end of the 1980s. Council of Mortgage Lenders' data show average advances as a multiple of earnings rising much more sharply, but with only a moderate rise in initial payments on new mortgages as a proportion of income. This could become a cause for concern in the event of a fall in incomes due to rising unemployment.

Sharp falls in nominal house prices and in employment have been important sources of financial stress for the household sector in the past. At the beginning of the year, house price inflation was still strong, but the most recent data suggest a gentle slowing down. The Halifax and Nationwide indices both fell by 0.4 per cent in May, with the annual growth rates falling respectively to 11.2 per cent from 14.2 percent and 15.8 per cent from 17.5 per cent in April. Data on all stages of the housebuying process now point in the same direction. The RICS and House Builders Federation surveys indicate a marked slowdown. Particulars delivered to the stamp office and loan approvals both fell in April; site visits and net reservations also show continuing weakness. In the construction market, private housing starts were down by 19.5 per cent on the previous month and 2.9 per cent in the three months to end-April over the previous quarter (with new orders falling by 7.1 per cent over the same period). Private housing completions fell by 6.9 per cent on the previous month, although they were still increasing slightly, by 1.2 per cent, quarter on quarter. The ratio of house prices to disposable incomes has increased since the beginning of 1999, but remains near its long-run average and fell slightly in the first quarter of this year, in part because of the continuing high growth rate of earnings. Chart 90, however, comparing London and the rest of the south-east with the United Kingdom as a whole, shows a steady increase since mid-1995 and a widening regional differential.

Unemployment and non-employment have continued to fall, and are both now below their 1989-90 levels (Chart 91). Overall, the risks facing the finances of households appear to be low. However, the GfK consumer confidence measures offer ambiguous evidence. Although consumers are feeling more

optimistic this quarter about their own financial position, their view of the general situation in the UK is weaker than six months ago (Chart 92). That could suggest less exuberance and more realism, or it might reflect pessimism about the impact of a continued high level of sterling.

**Chart 92:**  
**Consumer confidence**

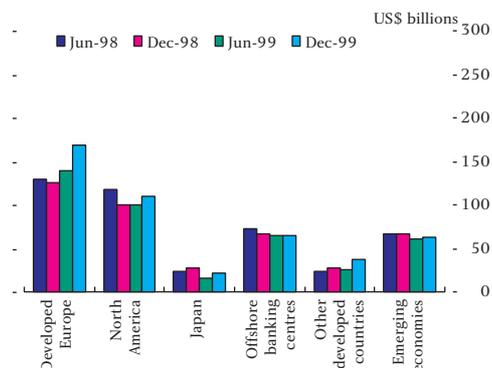


Source: GfK.

**(a)** Balance of responses to the question: 'How do you think the financial situation of your household will change over the next twelve months?'

**(b)** Balance of responses to the question: 'How do you think the general economic situation in this country will develop over the next twelve months?'

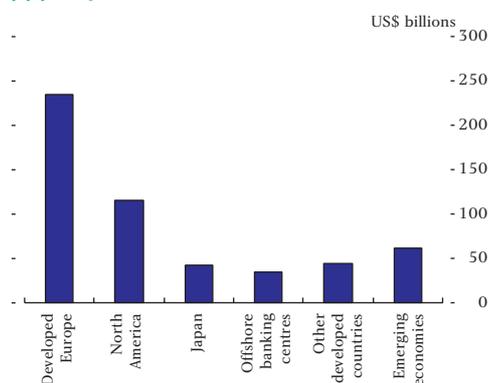
**Chart 93:**  
External claims on UK-owned banks – contractual debt<sup>(a)</sup>



Source: Bank of England.

(a) 'Developed Europe' is the BIS-reporting European economies, essentially western Europe. 'Other developed economies' are non-BIS reporting developed economies. 'Emerging economies' are developing economies and eastern Europe.

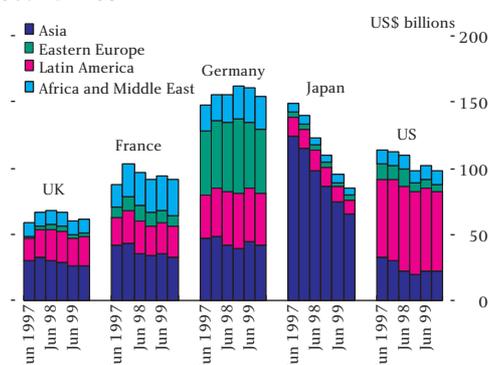
**Chart 94:**  
External claims on UK-owned banks, shown by country of ultimate risk 1999 Q4<sup>(a)</sup>



Source: Bank of England.

(a) 'Developed Europe' is the BIS-reporting European economies, essentially western Europe. 'Other developed economies' are non-BIS reporting developed economies. 'Emerging economies' are developing economies and eastern Europe.

**Chart 95:**  
Stock of bank claims on emerging economies<sup>(a)</sup>



Source: BIS.

(a) Claims of banks owned within BIS area countries.

## V The UK financial sector

### The UK banking sector

Since the November Review, full-year results for the major British banking groups (MBBG) have confirmed their continued strong profitability and capitalisation<sup>37</sup>. But the industry is undergoing rapid change, reflecting technological innovation and new competition, and developments over the past six months have highlighted potential pressures on retail margins. As well as affecting profitability, in the longer term these developments may make it less easy for UK banks to absorb shocks by adjusting margins. Perhaps more relevant in the short term is how banks respond to any decline in the profitability of established business, and in particular whether competitive pressures could lead to underpricing of risk.

#### International exposures

The international risks emanating from global imbalances and international asset market developments are considered above. UK banks are exposed to these risks through a number of channels, not least via their potential impact on the domestic economy. But UK banks' cross-border lending also generates direct exposures to problems affecting other economies; and they are exposed to asset markets via proprietary trading activities and counterparty credit risk.

Box 6 shows the structure of the UK banking sector's on-balance-sheet assets. Claims on non-residents account for 41 per cent of the total (Chart A, Box 6). But for UK-owned banks, the comparable share is considerably lower, about 17 per cent. On a consolidated basis, these exposures increased by 15 per cent in the six months to December 1999. Chart 93 suggests that that largely reflected lending to developed countries in Europe, rather than to more risky emerging economies. The value of exposures to EMEs is not significantly changed when adjusted to account for the country of ultimate risk (Chart 94), although total external exposures are substantially larger on this basis, principally as a result of a higher figure for lending to European counterparties. (The article by Buckle *et al* in this Review considers some possible market-based measures of expected losses on UK-owned banks' lending to various countries.)

UK-owned banks' emerging market exposures remain relatively small compared with those of banks incorporated in other major economies (Chart 95). Published results for HSBC and Standard Chartered, the two large UK banks which derive a significant part of their income from EMEs, presented a generally positive picture, consistent with the improvement in EMEs' performance over the past six months noted in Section II. HSBC reported a sharp

<sup>37</sup>: The MBBG are Abbey National, Alliance & Leicester, Bank of Scotland, Barclays, Halifax, HSBC Bank (the former Midland), Lloyds TSB, Northern Rock, Royal Bank of Scotland/NatWest, and Woolwich.

## Box 6: Assets of the UK banking sector

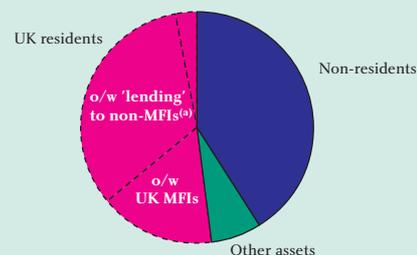
The composition of UK-operating banks' assets at the end of 2000 Q1 was broadly similar to that at the time of the *November Review*<sup>1</sup>. Chart A shows that 52 per cent of UK-operating banks' assets consisted of claims on UK residents, of which just under one-third were claims on other UK monetary financial institutions; 41 per cent were claims on non-residents. The remaining 7 per cent largely comprised property, items in suspense and collection, and accrued amounts receivable.

While the stock of lending to UK residents (Chart B) changes slowly, there have been some shifts in the composition of UK-operating banks' aggregate loan portfolio since 1999 Q2 (the latest date for which data were available at the time of the *November Review*). The proportion of domestic lending to primary and secondary industries fell slightly in the six months to end-2000 Q1. The share of lending to manufacturing also fell, by 1 percentage point to 6 per cent of the stock. The proportion of lending accounted for by service industries, on the other hand, increased. Lending to financial services rose from 26 to 28 per cent of the stock. And, despite weak growth in lending to the wholesale and retail trades, the share of lending to non-financial services increased (by 1 percentage point to 13 per cent).

The composition of UK-operating banks' lending to non-residents is shown in Chart C. The broad aggregates show only marginal changes in the second half of 1999, although there have been significant changes in the composition of claims on less developed regions. While claims on Eastern Europe and Asia fell by 10 per cent and 15 per cent respectively, claims on Latin America and the Caribbean rose by 2 per cent. The strongest growth over 1999H2 was in claims on non-BIS area developed countries (15 per cent), although these accounted for only 5 per cent of the banking sector's external claims.

<sup>1</sup> Here, the whole UK banking sector is considered ie all banks with a permanent establishment in the UK, including branches and subsidiaries of foreign banks. This excludes foreign banks operating in the UK via a representative office or the internet.

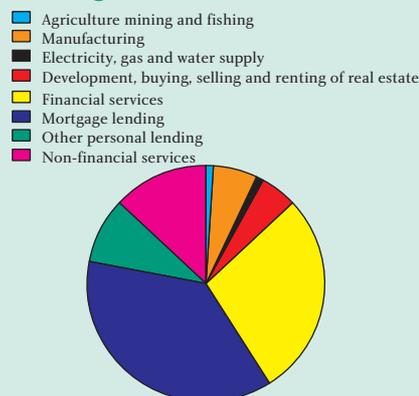
**Chart A:**  
Assets of the UK banking sector,  
UK-residents and non-residents 2000 Q1



Source: Bank of England.

(a) Defined as loans and advances to 'UK public sector' and 'other UK residents', claims under sale and repurchase agreements on 'UK public sector' and 'other UK residents', bills accepted by reporting institutions under facilities granted to UK residents which are still outstanding and holdings of commercial paper issued by UK residents.

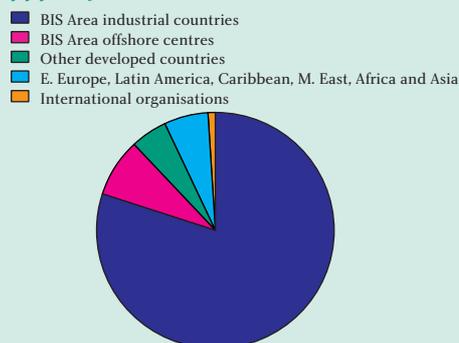
**Chart B:**  
UK banks' lending to UK residents  
excluding MFI's 2000 Q1<sup>(a)</sup>



Source: Bank of England.

(a) As in Chart A.

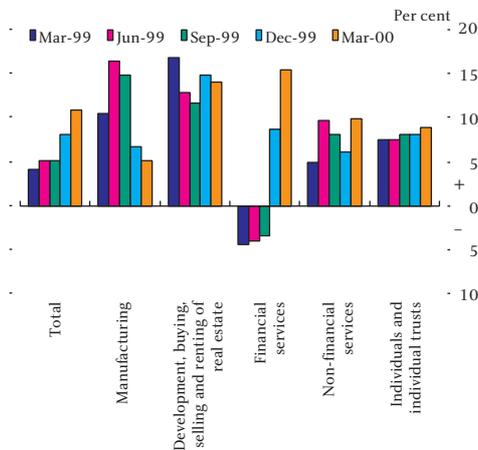
**Chart C:**  
UK banks' lending to non-residents  
1999 Q4<sup>(a)</sup>



Source: Bank of England.

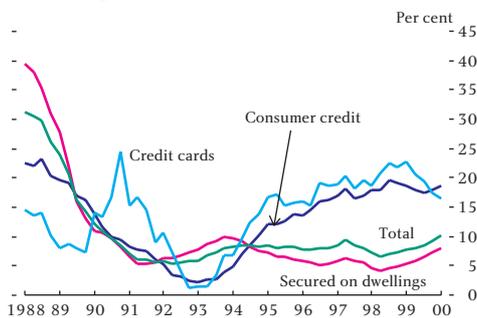
(a) This chart excludes 'unallocated claims', which are distorted by the inclusion of the positions of the Bank of England with other central banks within TARGET. If 'unallocated claims' were included, they would have accounted for 8 per cent of UK banks' external claims in 2000 Q1.

**Chart 96:**  
**Growth in lending by the UK banking sector to UK residents (in all currencies)<sup>(a)</sup>**



Source: Bank of England.  
**(a)** Four-quarter growth rates.

**Chart 97:**  
**Banks' sterling lending to individuals (excluding the effect of securitisations)<sup>(a)(b)</sup>**



Source: Bank of England.  
**(a)** Four-quarter growth rates.  
**(b)** 'Consumer credit' includes credit card lending and other lending to individuals not secured on dwellings.

**Chart 98:**  
**Proportion of mortgage advances to first-time buyers with loan-to-value ratios of 95% and above**



Source: Council of Mortgage Lenders.

decline in its provisions charge against its Hong Kong exposures and elsewhere in Asia-Pacific. Standard Chartered saw a slower recovery in Hong Kong, with its provisions charge almost doubling in 1999, but the position elsewhere in Asia improved.

#### Domestic exposures

The four-quarter growth rate in total bank lending to the UK private sector increased to 10.8 per cent in 2000 Q1, compared with 5.2 per cent in 1999 Q3. Lending to manufacturing has slowed sharply, but lending to property companies remains strong (Chart 96). And lending to individuals, accounting for 47 per cent of banks' UK loans outstanding, has accelerated. The pick-up in mortgage lending (80 per cent of banks' lending to individuals) reflected the buoyancy of the housing market (see Section IV), and an increase in mortgage equity withdrawal. Unsecured consumer lending has also continued to grow rapidly, although the rate of growth in banks' credit card lending (around 31 per cent of banks' total unsecured personal lending) has fallen back over recent months (Chart 97).

The November *Review* presented a fairly sanguine picture of the immediate risks from banks' domestic exposures and there is little reason to revise this conclusion. Section IV notes the risks arising from economic imbalances in the UK and increases in gearing. But there is little sign from the major UK banks' results of any serious deterioration in corporate lending portfolios, and the Bank of England's contacts with lenders support this view. Similarly, although lending to the commercial property sector remains strong, participants regard market fundamentals as robust (Section IV).

In contrast, the continued strength of the housing market over the past six months raised questions about the sustainability of recent gains in house prices, at least in London. But recent data suggest a slowing in the market may now be under way (see Section IV). And, from the lenders' perspective, the apparent robustness of personal sector finances and the decline in arrears and possessions offer reassurance as to the low risk of widespread default in the absence of a major adverse macroeconomic shock.

Also, although advance-to-income ratios have been rising, particularly in the south-east, average first-time buyer LTV ratios have apparently been declining, even in those parts of the country which have seen the strongest rises in house prices over the past year. Chart 98 suggests that the proportion of advances granted at ratios of 95 per cent plus has fallen significantly over the past two years, offering some protection to lenders in the event of any fall in nominal house prices. However, these data may not reflect the practices of all lenders, and a Financial Services Authority (FSA) survey carried out towards the end of 1999 drew attention to an apparent increase in the appetite for credit risk of some institutions.

The picture is more ambiguous in the case of unsecured lending to the personal sector. To date, there is little hard evidence of a marked deterioration in asset quality. However, the six<sup>38</sup> UK commercial banks' bad debt charges in UK banking increased by around 30 per cent in 1999, against corresponding asset growth of just under 11 per cent. New provisions against consumer lending were an important factor, although they were at least in part volume-related. This has not as yet been translated into any substantial increase in write-offs, although an underlying rise is apparent in write-offs and revaluations on credit card lending (Chart 99).

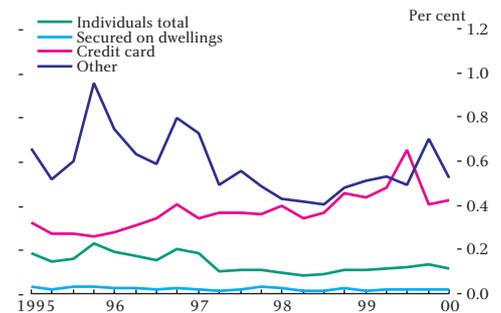
Bank of England contacts indicate that there may have been some deterioration in credit quality in consumer lending, in part reflecting rapid volume growth and some relaxation of lending criteria. While current credit-scoring techniques allow banks to control risk exposure more accurately, it is not clear how robust such techniques will prove in less favourable economic circumstances, given that in general they do not yet utilise much historical data. It is also possible that some lenders anxious to maintain market share could allow credit quality to deteriorate without fully pricing for increased risk.

Although evidence to date does not give obvious cause for serious concern, the continued rapid growth in banks' unsecured lending makes the review of bank lending policies and practices in this area initiated recently by the FSA<sup>39</sup> (and to which the Bank is contributing) a prudent precaution.

#### Capital adequacy and leverage measures

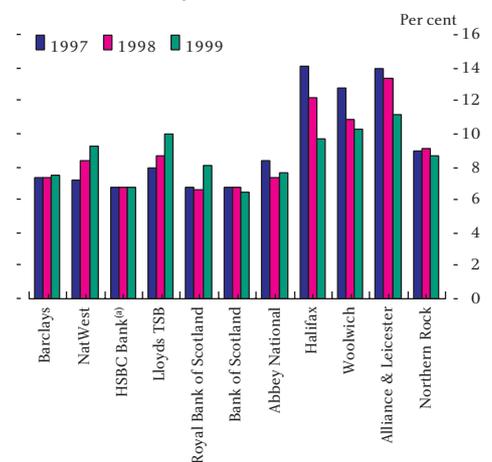
All the major UK-owned banks ended 1999 with Tier 1 capital ratios well above the Basel minimum of 4 per cent (Chart 100), and during last year their collective total capital ratio increased by 1 percentage point to 12.7 per cent. (Chart 101 shows the average risk-asset ratio for eight large UK banks since 1992). So these banks appear well able to absorb potential losses should market conditions deteriorate. This capital position has been supported by strong profitability over recent years. Also, changes in asset mix (including a big increase in the major banks' loan portfolios of the share of residential mortgages – weighted at 50 per cent for calculating capital requirements) have resulted in relatively modest growth in risk-weighted assets (Chart 102). Three of the more highly capitalised ex-building societies, Halifax, Woolwich, and Alliance and Leicester, returned capital to shareholders by way of share buybacks during 1999. But their Tier 1 ratios remain high compared with the MBBG as a whole (Chart 100).

**Chart 99:**  
UK banks' write-offs and other revaluations on loans to individuals as a percentage of balances outstanding



Source: Bank of England.

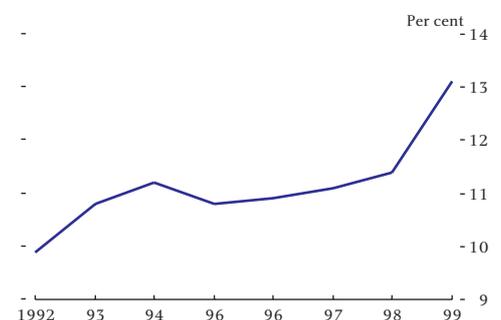
**Chart 100:**  
MBBG Tier 1 capital ratios



Source: Published accounts.

(a) HSBC Bank formerly known as Midland Bank plc.

**Chart 101:**  
Risk asset ratio<sup>(a)(b)</sup>



Source: Published accounts.

(a) Net capital/risk-weighted assets.

(b) Abbey National, Bank of Scotland, Barclays, Lloyds-TSB, Midland (now HSBC Bank), NatWest, Royal Bank of Scotland and Standard Chartered.

38: HSBC, Barclays, Natwest, Lloyds TSB, Royal Bank of Scotland, and Bank of Scotland.

39: See Howard Davies' evidence to Treasury Select Committee, 14 March 2000.

**Chart 102:**  
**Risk-weighted assets relative to total assets (unweighted averages)<sup>(a)</sup>**



Source: FSA.

(a) These data show banks' banking books on an unconsolidated basis. Commercial banks are Barclays, NatWest, Lloyds TSB, Midland (now HSBC Bank), Royal Bank of Scotland and Bank of Scotland. Mortgage banks are Abbey National, Halifax, Alliance & Leicester, and Northern Rock.

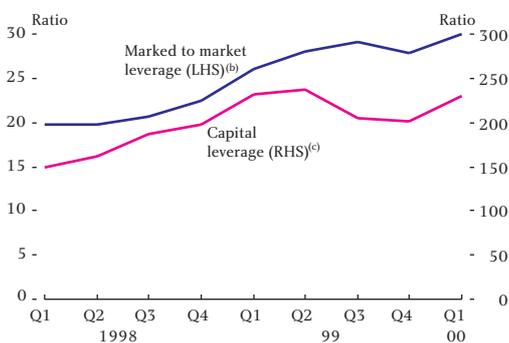
**Chart 103:**  
**UK banks' on-balance sheet leverage<sup>(a)</sup>**



Source: National Statistics (previously Office for National Statistics (ONS)).

(a) Assets/equity.

**Chart 104:**  
**Off-balance sheet leverage of banks in the London derivatives market<sup>(a)</sup>**



Source: Bank of England.

(a) Data unavailable prior to 1998 Q1.

(b) Gross notional value of derivative contracts over marked-to-market value of those contracts.

(c) Gross notional value of derivative contracts over banks' capital.

Some assessment of capital adequacy can be made for the wider population of institutions in the UK banking sector by examining crude measures of leverage. Section III of the November *Review* set out for the banking sector as a whole a range of simple indicators of on-balance-sheet leverage and of leverage attained through off-balance-sheet instruments. Taken together, these indicators may provide clues about developments in system-wide leverage.

A conventional measure of on-balance-sheet leverage for UK banks rose in 1999 (Chart 103), although it remained a little below the average of the past decade. Indicators of off-balance-sheet leverage of banks active in the London derivatives markets are illustrated in Chart 104. Both measures rose a little in 2000 Q1, and remain above the levels seen before the LTCM episode. But such measures should be treated as no more than indicative: most intermediaries suggest that the amount of market risk they are running remains well below pre-LTCM levels, and that they are paying more attention to the matching of instrument types in their hedges.

#### Liquidity

As noted in the November *Review*, the extent of maturity transformation by the UK banking sector is a key issue from a financial stability perspective. At the end of April 2000, one measure put sterling net liquid<sup>40</sup> liabilities at around £380 billion, broadly unchanged from the end of 1999. Around 70 per cent of this sterling mismatch was accounted for by UK-owned banks.

Chart 105 shows that the UK banking sector had net liquid foreign-currency liabilities of around £200 billion during 1999. In the first four months of the year, this mismatch increased further – at the end of April, it was £243 billion. That was about 16 per cent of total foreign currency assets, which compares with a figure of nearer to 20 per cent in 1997. While UK-owned banks ran a foreign currency mismatch of £66 billion at end-April, much of the industry's mismatch was attributable to international banks located in the UK, reflecting London's role as a major international banking centre. Most of this mismatch is, in turn, in branch operations (rather than separately incorporated local subsidiaries), and so may be offset by the composition of the rest of banks' global balance sheets.

Mismatches between assets and liabilities are inherent in banking, and require banks actively to manage their liquidity positions. That was particularly important over the run-up to the millennium date change, given the uncertainty about its

<sup>40</sup>: 'Liquid' is defined as those assets and liabilities with a residual maturity of approximately under one year. Liquid liabilities consist of sight/time deposits, certificates of deposit and commercial paper, repos and other short-term liabilities. Liquid claims are market loans, bills and short-term paper, reverse repos, 50 per cent of other loans and advances, holdings of gilts and other short-term claims.

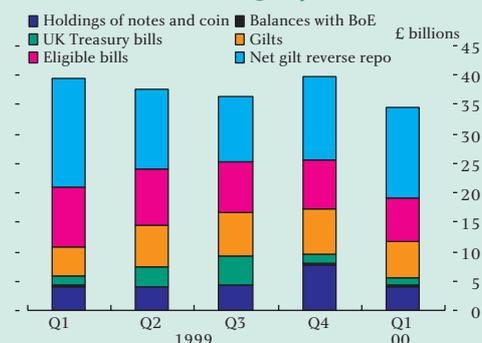
## Box 7: Major British banks' liquidity management over the millennium date change

The major British banks' management of their liquidity positions since the November *Review* was heavily influenced by preparations for the millennium date change. In theory, banks faced three potential problems. First, withdrawal of wholesale funding as uncertainty in financial markets increased. Second, and conversely, a temporary flight of retail and wholesale deposits to the major British banks as a perceived safe haven. Third, a sharp increase in the public's demand for cash.

Banks dealt with these potential problems in a number of ways. Market anecdote suggests they agreed wholesale customer deposit limits and offered low interest rates on certain wholesale deposits, to contain any 'flight to quality'. Also, as Chart A illustrates, they increased their stock of sterling liquid assets as the year-end approached. They also increased their CD holdings by £4.5 billion in 1999 Q4. Finally, they made use of the Bank of England's extension of the collateral accepted in open market operations, notably to include bonds issued by European Economic Area governments and certain international institutions. The banks' holdings of these liquid assets rose significantly in the second half of 1999 to stand at around £14 billion in December. The increased stock of eligible collateral held by the MBBG provided a buffer to meet any unexpected sterling outflows over the year-end. This 'war chest' of collateral was unpacked in January (Chart A) as the threat of millennium dislocations passed.

As a result of the measures to increase their stock of liquid assets, the MBBG's sterling stock liquidity ratio<sup>1</sup> rose to over 160 per cent in October 1999 and stayed above that level throughout 1999 Q4, before declining to under 150 per cent in May 2000 (Chart B). The average for this series since July 1997 is 137 per cent.

**Chart A:**  
MBBG stock of sterling liquid assets



Source: Bank of England.

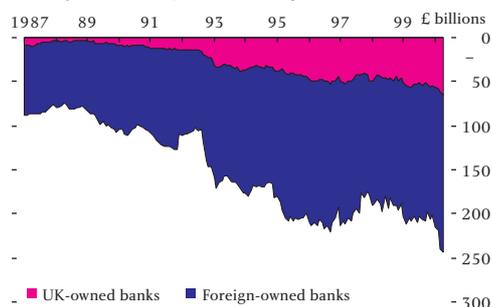
**Chart B:**  
MBBG sterling stock of liquidity ratio



Source: FSA.

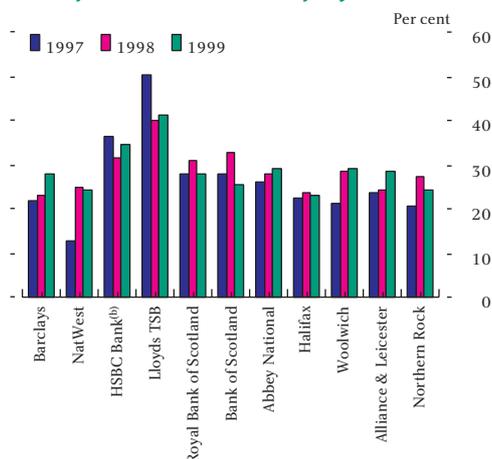
<sup>1</sup>: The supervisory measure, introduced in 1996, of liquid sterling assets as a proportion of assumed short-term sterling outflows. See FSA 'Guide to banking supervisory policy', sterling stock liquidity chapter, [www.fsa.gov.uk/pubs/supervisor](http://www.fsa.gov.uk/pubs/supervisor).

**Chart 105:**  
**Net liquid foreign currency assets**



Source: Bank of England.

**Chart 106:**  
**MBBG pre-tax return on equity<sup>(a)</sup>**

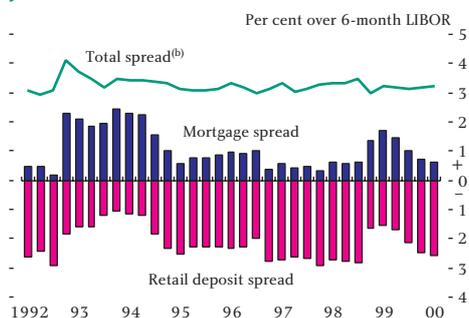


Source: Published accounts.

(a) Book value of equity.

(b) HSBC Bank, formerly known as Midland Bank plc.

**Chart 107:**  
**Banks' mortgage and retail deposit spreads<sup>(a)</sup>**



Sources: Bank of England, Building Societies Commission and National Statistics (previously Office for National Statistics (ONS)).

(a) Data subject to population changes.

(b) Mortgage spread minus retail deposit spread.

**Table 15: MBBG spreads and net interest margins<sup>(a)</sup>**

Per cent	Spread		Margin	
	1998	1999	1998	1999
Barclays	3.4	3.9	4.4	4.5
NatWest	2.5	2.5	3.3	3.2
Midland/HSBC Bank <sup>(b)</sup>	2.2	2.3	2.5	2.7
Lloyds TSB	2.9	3.2	3.8	3.9
Royal Bank of Scotland	2.0	2.1	2.5	2.5
Bank of Scotland	N/a	N/a	2.9	2.7
Abbey National	2.1	2.2	2.4	2.5
Halifax	2.1	2.0	2.3	2.3
Woolwich	2.1	2.2	2.2	2.1
Alliance & Leicester <sup>(c)</sup>	2.0	2.0	2.5	2.4
Northern Rock	1.2	1.1	1.6	1.4

Source: Dresdner Kleinwort Benson and published accounts.

(a) 'Spread' is the average amount earned on interest-bearing assets less the average cost of interest-bearing liabilities. 'Margin' is net interest income divided by average interest-bearing assets.

(b) Spreads relate to the group.

(c) Retail banking.

potential impact. In the event, as Box 7 describes, the period passed off quietly.

### Profits and margins

The major British banks' 1999 results revealed pre-tax returns on equity of between 23 and 42 per cent (Chart 106). While, in some cases, these were boosted by share buy-back programmes (see above), underlying performance remains strong and compares well with major banks in the United States and Europe.

This continued strong financial performance reflects the buoyancy of core retail markets<sup>41</sup>. Also, cost control has generally been good, resulting in flat or declining cost-income ratios. Banks' accounting profits have also benefited from relatively modest increases in the overall charge for bad debts, partly reflecting the decline in provisions against international exposures after the large losses of 1998 and perhaps improvements in risk management.

Despite apparently intense competition from new entrants in retail markets, major banks' annual results suggest that lending margins have, with some exceptions, generally held up (Table 15). Similarly, Chart 107 shows that spreads on retail-funded mortgage lending have remained very stable. A number of factors

<sup>41</sup> According to the recent HMT report 'Competition in UK Banking', the major UK banks derived just over 50 per cent of profits in 1998 from retail (personal and small business) banking.

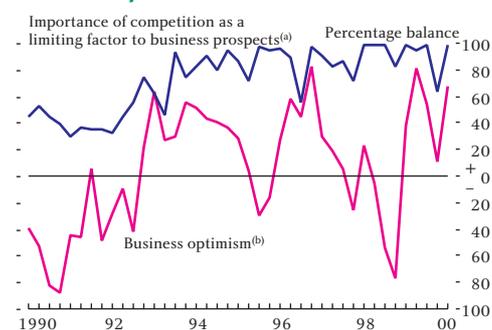
may help to account for that. First, the resilience of retail margins to some extent reflects established banks' possession of a large, relatively inert, 'back book' of loan and savings balances<sup>42</sup>, although this benefit may be eroded over time. Second, those banks with a large current account base may have been less vulnerable to competition in the retail savings market. In any case, retail savings spreads have widened as official rates have risen (Chart 107). Third, margins have continued to benefit from a switch in banks' portfolios towards wider-margin unsecured consumer lending. The latter accounted for 10.5 per cent of the UK banking sector's lending to UK residents at the end of 1999, compared with 9.3 per cent at the end of 1997. Returns should therefore be expected to increase on a risk-unadjusted basis.

The CBI Financial Services Survey for 2000 Q1 indicates that business optimism in the banking sector remains buoyant (Chart 108). But banks continue to cite concerns about domestic competition as the most important factor by far limiting future prospects. And the maintenance of interest spreads and margins has in some cases been reflected in a sustained loss of market share. New entrants such as Prudential's Egg and Standard Life Bank have quickly built up substantial shares of new business by using direct distribution channels such as the telephone and the internet. The inroads made by new entrants in the deposit market are illustrated in Chart 109. Established lenders have also seen their share of the mortgage stock eroded in recent years as a result of a relatively low share of net advances (Chart 110), although that also reflects a policy on the part of the converted building societies to diversify business.

Concerns that current levels of profitability may not be sustainable in the longer term may have influenced investor sentiment towards the bank sector over recent months (and such concerns may have been affected to some extent by the possibility of regulatory changes raised by the recent report on *Competition in UK Banking*). As noted in the November *Review*, the share prices of those banks for which mortgages are a large share of assets have tended to underperform. And despite strong financial results, this has been reflected to a lesser extent in the performance of the sector as a whole in recent months (Chart III). To the extent that core business margins were to come under pressure, banks seem likely to respond by using new technology to reduce costs and boost sales (either to new customers or their existing customer base). There may also be further restructuring in the sector to reduce costs (Royal Bank of Scotland cited such a benefit regarding its recent acquisition of

<sup>42</sup>: Salomon Smith Barney (SSB) ('Spotters guide to the savings and mortgage markets', June 2000) estimate that the difference between the Plc banks' back-book and 'new business' mortgage spreads was around 130 percentage points in May, compared with a difference of only 40 percentage points for SSB's sample of new entrants (Direct Line, Egg, First Direct, Legal & General, Sainsbury Bank, Standard Life, Tesco, Virgin, First-e and Smile).

**Chart 108:**  
**Business optimism**

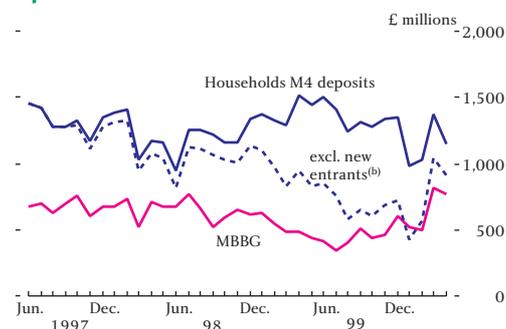


Source: CBI/PricewaterhouseCoopers Financial Services Survey.

(a) Number of respondents who recorded an increase in competition minus those recording a reduction or no change in competition.

(b) Number of respondents who recorded an increase in business optimism minus those recording a reduction or no change in business optimism.

**Chart 109:**  
**Monthly flows of households' M4 bank deposits<sup>(a)</sup>**

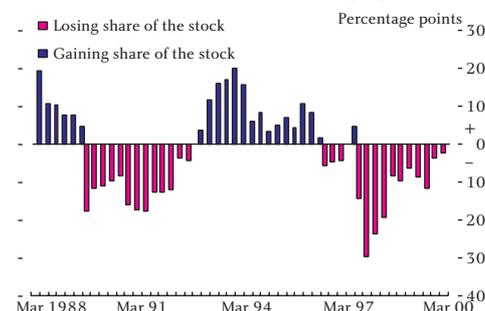


Source: Bank of England.

(a) Twelve-month moving averages.

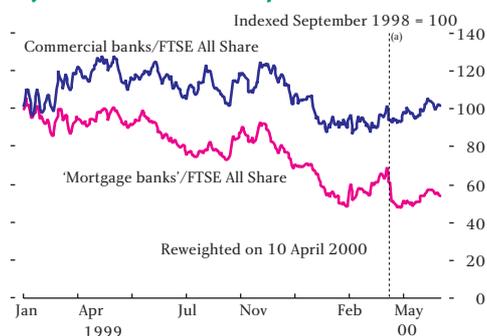
(b) New entrants are Direct Line, Egg, Legal & General, Sainsburys, Standard Life and Tesco.

**Chart 110:**  
**Banks' share of net mortgage advances minus their share of the mortgage stock**



Source: Bank of England.

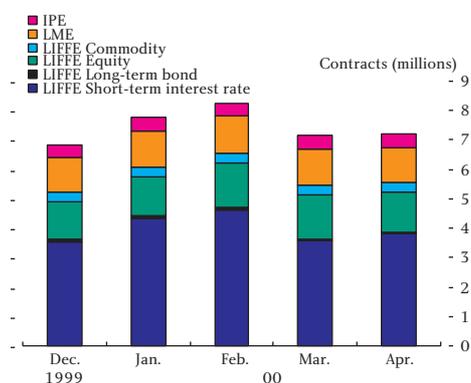
**Chart 111:**  
Major UK banks' share-price indices



Source: Bloomberg.

(a) Dotted line indicates series re-weighted on 10 April 2000 and re-based to 7 April's index value to account for NatWest/RBS merger.

**Chart 112:**  
Open interest by type of contract on exchanges cleared by London Clearing Houses



Source: LIFFE, LME and IPE.

**Chart 113:**  
UK banks' euro sale and repurchase agreements: analysis by counterparty



Source: Bank of England.

NatWest) or to boost or diversify business volumes (one motive for Lloyds TSB's acquisition of Scottish Widows).

## The London Clearing House

The London Clearing House (LCH) is the central counterparty for exchange-traded contracts on LIFFE, the London Metal Exchange and the International Petroleum Exchange. It also offers central counterparty clearing services for European government bond repos (Repoclear), OTC interest rate derivatives (Swapclear), and the Tradepoint Stock Exchange. Because it stands at the centre of these international markets, LCH's soundness is very important (see Section VI). As a broad indicator of the market risks which LCH manages, Chart 112 shows open interest in the main types of contract on the exchanges for which LCH clears. Little has changed since the November *Review*. Open interest in LIFFE short-term interest rate contracts – mainly the Euribor contract – remains the largest element.

The November *Review* drew attention to the growth of the US repo market following the 1995 introduction of a similar service to LCH's Repoclear and to the need to monitor European markets for signs of over-extension, excessive risk concentration or declining risk management standards. Repoclear is currently clearing transactions in German and Belgian government bonds. It has 18 member banks and had registered over 16,400 trades with a nominal value of €1 trillion by 18 May 2000. Chart 113 shows outstanding sale and repo transactions of UK banks denominated in euro. There is no sign yet that central clearing has increased the size of the euro repo market, although the measure is imperfect because it excludes Repoclear's members outside the UK and includes repo transactions in euro securities that are not currently cleared centrally. Also, the millennium date change had a clear effect on amounts outstanding at the end of 1999. Any influence may be clearer towards the end of the year, by which time Repoclear expects to have extended its services to other European government bond markets and to cash market trades.

## The life insurance sector

Recent indicators of life sector performance have been generally favourable. New business results for 1999 (Chart 114) show strong growth in annualised equivalent premium income – an industry measure of trading volumes – and industry confidence has improved over the past year (Chart 115).

Nevertheless, pressures on the sector remain. The market environment may become more challenging, reflecting increased competition and greater transparency. And an unanticipated fall in inflation over recent years, accompanied by a sharp decline in nominal interest rates, has already had a major impact on the sector.

Insurance companies' exposures to guaranteed annuities are one manifestation of that impact. Such contracts (either with-profit or unit linked) provide a target cash sum, but allow policyholders an option to convert the cash sum into an annuity at guaranteed nominal rates. The risks run by guaranteeing annuities have materialised because of the unanticipated decline in nominal interest rates noted above and also improved mortality. The lower is expected mortality and the lower are long-term nominal interest rates, the higher will be the price of an annuity on the open market. When the guaranteed annuity terms of an insurer become more favourable than the terms on which an annuity can be bought with the cash sum in the open market, holders of guaranteed annuity policies are likely to exercise their option. The value of the option rises as interest rates and mortality rates fall.

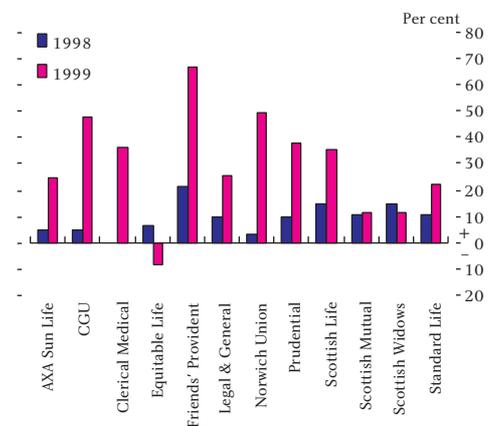
Insurance companies appear to have been slow in the past to price such products appropriately or to reserve fully for resulting exposures, effectively assuming that the chances of a regime change in monetary policy were slim. They have subsequently been forced to increase reserves and/or to attempt to hedge their exposures by use of derivative products.

Low inflation and falling nominal interest rates have also produced lower nominal returns on with-profit endowment policies, increasing the risk that payouts on policies used as mortgage repayment vehicles will fail to cover the debt outstanding. The problem does not arise with currently maturing policies because they have benefited from the high nominal interest rates that prevailed in earlier years. But most insurance companies are predicting shortfalls on policies sold more recently, particularly in the late 1980s and early 1990s, when the illustrative nominal growth rates projected for endowment policies were well in excess of rates currently expected.

The fall in inflation which is producing lower *nominal* returns to policyholders has also been reflected in lower nominal mortgage interest rates, so it is not necessarily the case that policyholders face a real loss. Nevertheless insurance companies face the possibility that policyholders may seek redress for endowment policy shortfalls if and when they emerge. That will depend on whether insurance companies (and independent financial advisers) can show that policyholders were properly advised of the risks involved at the time the policy was taken out.

Life insurance companies' desire to strengthen their solvency position has been reflected in their asset-liability management. Annual bonuses on with-profit policies have been declining (Chart 116), providing greater flexibility by limiting guarantees (in the form of previously attached annual bonuses) and passing on more of the investment risk to policyholders.

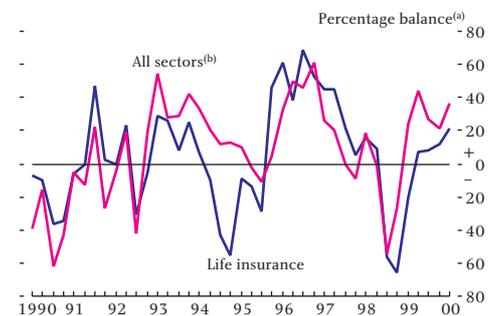
**Chart 114:**  
**Growth in new business<sup>(a)</sup>**



Source: Published accounts.

(a) Percentage change over previous year. New business figures based on Equivalent Premium Income (EPI) industry measure (one tenth of new single premiums plus all new annual premiums).

**Chart 115:**  
**Life insurance company business confidence**



Source: CBI/PriceWaterhouseCoopers Financial Services Survey.

(a) Number of respondents who recorded an increase in business confidence minus those recording a reduction or no change in business confidence.

(b) Banking, Finance Houses, Building Societies, General and Life Insurance, Securities Trading/Stockbroking Insurance Brokers, Fund Management, Commodity Brokers, Venture Capital and other financial institutions.

**Chart 116:**  
**Bonus declarations<sup>(a)</sup>**



Source: Bank of England, MoneyMarketing.

(a) With-profits bonuses are guaranteed once declared. Annual bonuses are declared on the sum assured and on previously attached bonuses.

## VI Risk-reducing developments in the financial infrastructure

This section reviews progress since the November *Review* with some key official and market initiatives designed to reduce risks in the international financial system<sup>43</sup>.

### Transparency, standards and codes

#### *IMF and Financial Stability Forum initiatives*

As hoped at the time of the June 1999 *Review*, most of the countries that subscribe to the IMF's Special Data Dissemination Standard (SDDS) – including 18 EMEs – are now disseminating data on their foreign currency reserves and foreign currency liquid liabilities. This is a useful increase in transparency.

The joint IMF-World Bank Financial Sector Assessment Programme (FSAP) was introduced on a pilot basis during 1999 to help countries identify areas of their financial systems which need strengthening, and to guide implementation and sequencing of financial sector reform. Twelve countries are included in the initial pilot programme and the IMF Board recently decided to add a further 24 countries in 2001<sup>44</sup>. Over time, FSAPs could make a significant contribution to strengthening national financial systems. The possibility of voluntary publication of Financial Sector Stability Assessments, based on FSAPs, will be examined when the pilot project is reviewed towards the end of this year.

Assessments of progress in implementing key codes and standards will be included in a country's Report on Standards and Codes (ROSC). Individual countries decide whether to publish their ROSCs. The IMF has embarked on a third round of experimental ROSCs and around 50 assessments of a range of standards and codes in 24 countries are under way.

The Financial Stability Forum (FSF) report on Offshore Financial Centres (OFCs)<sup>45</sup>, published in April, concluded that certain OFCs – but not all – constituted a weak link in the international financial system and could hinder wider efforts to raise standards of soundness and transparency. The report also recommended a framework of key international standards for OFCs. In May, the FSF published a list of OFCs based around three groups, reflecting perceived quality of supervision and degree of international co-operation<sup>46</sup>.

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<sup>43</sup>: A number of important developments and initiatives are covered elsewhere in this *Review*, including the Core Principles on systemically important payment systems (separate article), the FSF Report on Capital Flows (Section II of this Assessment), and the BCBS report on HLIs (Section III).

<sup>44</sup>: See [www.imf.org/external/np/omd/2000/report.htm](http://www.imf.org/external/np/omd/2000/report.htm).

<sup>45</sup>: *Report of the Working Group on Offshore Financial Centres*, 5 April 2000, available at [www.fsforum.org](http://www.fsforum.org)

<sup>46</sup>: Available at [www.fsforum.org](http://www.fsforum.org)

#### *International accounting standards: harmonisation*

Accounting standards also make a very important contribution to transparency, especially in the unregulated non-financial corporate sector. IOSCO announced in May that it had endorsed the 'core set' of international accounting standards (IASs) prepared by the International Accounting Standards Committee (IASC)<sup>47</sup>. Although the endorsement is not binding on individual securities regulators, and there are certain supplemental provisions, it increases the likelihood that more robust and transparent standards will be adopted internationally. The European Commission subsequently released a Communication, *EU Financial Reporting Strategy: the way forward*, which sets out plans to require all EU companies listed on a regulated market to prepare consolidated financial statements in accordance with International Accounting Standards by 2005 at the latest.

#### **Bank risk management: liquidity**

Prudent liquidity management is essential to banking system stability but, at least compared with capital adequacy, it has become a relatively neglected area of study and debate, in part reflecting the deep and liquid money markets in which industrial country banks are generally able to manage their liquidity. Even in such markets, however, robust liquidity is not a given. And in emerging market economies, liquidity can evaporate, as the Asian crises showed. Two key lessons from that episode, for both G10 and EME banks, are the importance of prudent management of liquidity in foreign currencies as well as in the domestic currency; and how liquidity risk, foreign exchange risk, interest rate risk and credit risk can interact in stressed conditions.

In February 2000, the Basel Committee on Banking Supervision issued *Sound practices for managing liquidity in banking organisations*, updating its 1992 guidelines on bank liquidity management. As this important initiative has not received the coverage that it warrants, some of its main provisions are summarised in Box 8.

#### **Developments in market infrastructure**

##### *Settlement Finality Directive: implementation*

The June 1999 *Review* described the preparations to implement the EU Settlement Finality Directive, which is designed to make payment and settlement processes safer by making it clear that the rules of designated systems are legally robust in the event of the insolvency of a participant. Since then, a number of countries have designated systems, as recorded in Table 16.

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<sup>47</sup>: See [www.iosco.org/iosco.html](http://www.iosco.org/iosco.html).

*Continuous Linked Settlement Bank: unwelcome delay*

A major remaining source of systemic risk in the global financial system stems from the two legs of foreign exchange transactions being settled at different times across the payment systems for the two currencies. This leaves the party that makes the initial payment in the first currency exposed for the full value of the transaction until it receives the corresponding payment with finality in the second currency. An article in the November *Review* described the private sector Continuous Linked Settlement Bank (CLSB) project to address foreign exchange settlement risk by providing for 'payment-versus-payment' settlement, so that the two legs of the transaction settle simultaneously. At the time, CLSB expected to begin operating in the final quarter of 2000. Subsequently, CLS Services announced

**Table 16: EU payment and securities settlement systems designated under the Settlement Finality Directive (as at 8 June 2000)**

<b>Member state</b>	<b>Payment systems</b>	<b>Securities settlement systems</b>
Belgium	ELLIPS; UCV-CEC; Verrekenkamer	Euroclear; NBB Clearing; CIK; BXS Brussels Exchanges
Germany	ELS; EAF; ECB Payment Mechanism; Euro 1; EMZ; AZV; 'embedded' payment systems of Clearstream Banking AG and Eurex Clearing AG	All securities clearings of Clearstream Banking AG and Eurex Clearing AG
Spain	SLBE; SEPI	CADE; systems under the supervision of the CNMV; systems under the supervision of local governments
Greece	Hermes; Euro-Hermes; Athens Clearing House	Bank of Greece book-entry transfer system; Athens Central Securities Depository; derivatives clearing system
Ireland	IRIS RTGS System; paper debit, paper credit and electronic payment clearings	Central Bank of Ireland Securities Settlement Office
Netherlands	TOPS; systems operated by Interpay Nederland BV	AEX-Effectenclearing BV; AEX-Optieclearing BV; ASAS Servicing Company NV; Necigef BV; NIEC BV
Austria	ARTIS	-
Portugal	SPTG; SICOI; SLOD	SITEM; Interbolsa; derivatives clearing system
Sweden	RIX	VPC systemet; OM Stockholmbörsen AB
United Kingdom	CHAPS Sterling; CHAPS Euro	

Source: European Commission.

a delay to the planned launch date of around a year. On 10 May, the Governors of the G10 central banks published a statement expressing regret at the delays and encouraging market participants to intensify their efforts<sup>48</sup>. The Governors also reaffirmed their strategy to promote the reduction of foreign exchange settlement risk, which puts the primary responsibility on private sector market participants.

*Infrastructure consolidation: clearing house risk management*

Since the November *Review*, there have been a number of agreements to consolidate market infrastructure in Europe. It is important that these merged entities give sufficient attention to operational resilience and risk control, both in the design of new systems and during the process of change. If consolidation is implemented effectively, there could be benefits for financial stability as well as cost savings for market participants. For example, more efficient cross-border settlement of securities within the euro area should facilitate the further development of cross-border euro repo, possibly bringing a reduction in unsecured interbank exposures.

LCH and the French clearing house Clearnet announced plans in early April to combine their central counterparty services. The consolidation and expansion of clearing houses is a central concern for financial stability because, as discussed in previous *Reviews*<sup>49</sup>, they take on the counterparty credit risk in the markets that they clear. Clearing additional markets can have a number of advantages. It may diversify a clearing house's exposures to its existing clearing members. It may also provide more information about members' overall trading positions, which can be passed on to regulators as necessary. More co-ordinated margining of connected markets may reduce liquidity demands on member firms following large market movements.

But the expansion of a clearing house's activities increases the importance of the integrity of its risk management systems. It is crucial that clearing members have good incentives to monitor and control risks taken on by the clearing house. Provision of initial margin provides such an incentive for a member's own trades because margin deposits and collateral cover the first losses following a default. Also, contributions to a default fund or shareholdings in the clearing house encourage members to take an interest in its overall risk management. This suggests that clearing houses should be controlled by their members rather than by third parties, which might have objectives other than risk management. Trading platforms such as exchanges, for example, are increasingly operating in a competitive market in which their owners seek to maximise trading volumes and profits.

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<sup>48</sup>: Available at [www.bis.org/press/index.htm](http://www.bis.org/press/index.htm)

<sup>49</sup>: Rule, Hills, Parkinson and Young, 'Central Counterparty Clearing Houses and Financial Stability', June 1999 *Review*.

Their objectives may no longer be consistent with the need for the owners of clearing houses to give priority to risk control. Ownership details of LCH-Clearnet post-merger have not been finalised, although users will hold the majority of voting rights.

#### *LIFFE techMARK 100 index future*

LIFFE has announced the launch on 27 June of a futures contract on the FTSE techMARK 100 index. The index includes technology companies with a capitalisation under £4 billion at the launch of techMARK in October 1999. techMARK is the London Stock Exchange's market for technology stocks. If successful, the new contract could provide a useful hedge for investors and underwriters of new issues in the technology sector.

### **Information about custody and settlement risks**

As investment flows become more global, it is increasingly important that institutional investors understand any risks to which they are exposed in using overseas securities depositories. A new SEC Rule<sup>50</sup> requires US investment funds to oblige their global custodians to analyse and monitor custody risks in using depositories, and to provide that information to the fund. The Rule became effective on 12 June and funds must comply by 2 July 2001. Fund managers and global custodians are beginning to assess the practical implications of the Rule. As part of one initiative, the Association of Global Custodians, a group of US custodian banks, is sending a standard questionnaire to around 100 depositories world-wide in order to give its members additional factual information to feed into their risk analyses. UK-investing institutions should also be able to ask their custodians for these analyses, which they can then incorporate into their overall assessment of the risks of participating in an overseas securities market. This could be an important initiative as the extent to which many depositories incorporate risk-reducing features (such as effective Delivery-versus-Payment arrangements) is often unclear.

### **Documentation: the cross-product master agreement**

The reduction of counterparty credit risk is the central aim of the Cross-Product Master Agreement (CPMA), launched in February this year by the Bond Market Association (BMA) and an international consortium of financial trade associations<sup>51</sup>. This 'umbrella' agreement facilitates bilateral set-off of close-out amounts outstanding under various industry master agreements following an event of default. The CPMA is written to be enforceable under US and English law. The BMA is now working to extend the CPMA to include affiliates, so that counterparties would have a single, consolidated exposure at group level. The

<sup>50</sup>: Rule 17F-7 of the Investment Companies Act 1940 ([www.sec.gov/rules/final/ic-24424.htm](http://www.sec.gov/rules/final/ic-24424.htm)).

<sup>51</sup>: Available at [www.bondmarkets.com/agrees/cpmna.pdf](http://www.bondmarkets.com/agrees/cpmna.pdf).

## Box 8: The Basel Committee's recommendations on sound practices for managing liquidity risk

The key recommendations are:

- **Developing a structure for managing liquidity**

Banks should have a liquidity strategy for the whole bank supported by all layers of management from the Board downwards. The paper requires banks to set limits on their liquidity positions. These might take the form of limits on cumulative cashflow mismatches over particular time horizons and/or holdings of liquid assets as a percentage of short-term liabilities. Banks are expected to have adequate information systems for measuring, monitoring, controlling and reporting liquidity risk, and to calculate their positions daily for shorter time horizons. Banks must have adequate internal controls over liquidity management with regular external review.

- **Measuring and monitoring net funding requirements**

Net funding requirements should be measured and monitored, typically using a maturity mismatch 'ladder' and at both short-term and more distant time horizons. The paper recommends that banks analyse their liquidity under a variety of scenarios, including bank-specific problems and general market crises. It provides guidance on how to assess and categorise the liquidity of different asset types under different scenarios.

- **Managing market access** Banks should develop relationships with liability holders and participate actively in capital markets so that liquidity is more likely to be available if needed. The paper recommends that banks develop contingency plans. It draws attention to the growth of asset securitisation and the liquidity risks to banks that provide back-up lines to these programmes.
- **Foreign currency liquidity** Banks should measure, monitor and control liquidity positions in the major currencies in which they are active. The report discusses use of foreign currency deposits to fund domestic currency assets and the funding of foreign currency assets with domestic currency. Banks should consider setting limits on cashflow mismatches for foreign currencies over particular time horizons, both in aggregate and for individual currencies, particularly where the foreign exchange market is not highly liquid. Mismatch limits should generally be lower than for domestic currency liquidity. Banks should examine the likely impact of stress scenarios, broken down by currency.
- **Public disclosure** The report notes the importance to bank liquidity of banks managing public perceptions, both in normal and crisis times.
- **Role of supervisors** Supervisors are advised to assess a bank's strategy, policies and procedures for liquidity management and obtain regular information with which to evaluate liquidity risk. Supervisors may set requirements for limits or ratios and monitor compliance through regular reporting.

Association's more immediate priority is to encourage use of the existing CPMA. Market participants have expressed support for the initiative but actual use appears limited as yet. Potential users may be completing due diligence and acceptance testing.

# G10 seminar on systems for assessing banking system risk

Andrew Logan, Regulatory Policy Division, Bank of England

Regulators and central banks are putting increasing effort into developing models and systems to provide early warning of fragility in banking systems. A seminar was recently held at the Bank of England on such monitoring and early warning systems employed by G10 central banks and regulatory authorities, focusing on developments in their construction and performance. This article summarises the proceedings.

**A NUMBER OF** banking supervisory bodies and central banks, across the G10, have developed, or are in the process of developing, monitoring or early warning systems of banking risk. Some approaches are designed to provide early indications of weakness in particular firms and therefore to supplement supervisory judgments, while others are designed to provide forewarning of weakness in the banking system as a whole from a financial stability viewpoint.

The Bank hosted a seminar in March, for the Research Task Force of the Basel Supervisors Committee, on the early warning systems developed by member organisations. The seminar focused on the different approaches taken to building the systems and their performance during the 1990s. Most of the focus of the seminar was on systems designed to pick up firm-level weaknesses. This article provides an overview of the discussion at the seminar.

Surveillance systems can be divided into two types, depending on their objective. One type, usually called 'monitoring systems', use quantitative (and sometimes qualitative) information about banks to assess their current financial condition or risk profile. The other type, usually called 'early warning systems' are intended to be more forward looking, using quantitative information to predict which banks will

fail or at least are more likely to be downgraded in future supervisory assessments. Both draw their information primarily from banks' management accounts and/or prudential returns.

## Monitoring systems

There was a detailed discussion of the monitoring systems used in the UK and the Netherlands. Michael Stephenson (Financial Services Authority, UK) discussed RATE<sup>1</sup> – the risk-based approach to supervision used by the banking supervisors in the UK – and their experience in implementing it since its introduction in early 1998. Han van der Hoorn (De Nederlandsche Bank) discussed the design of RAST<sup>2</sup> – the Dutch banking supervisors' risk analysis methodology. There was a review of the differences between the two approaches. It highlighted how RAST aggregates across risks and controls to derive a score for the individual business units, before combining them into a rating for the whole bank by using a mathematical formula. In contrast, RATE aggregates across business units to get a rating for the nine business and control risks, which are then combined less formally into a rating for the entire institution.

## Early warning systems

Representatives of various G10 central banks and supervisory authorities gave presentations on their

1: RATE is Risk Assessment, Tools of Supervision and Evaluation.

2: RAST is Risk Analysis Support Tool.

early warning systems. There were significant differences in what the systems were trying to predict. Some targeted the regulator's future rating for a bank or the likelihood that it might be downgraded (the Federal Reserve's ratings model, the Federal Deposit Insurance Corporation (FDIC)'s SCOR<sup>3</sup> model and the model used for research purposes at the Banca d'Italia). Others tried to predict bank failure (the Federal Reserve's risk rank model) or failure and distressed merger (the Office of the Comptroller of the Currency (OCC)).

In some countries, typically those in Europe, the available choice was restricted, as historically there were too few bank failures to make the construction of a model aimed at predicting them statistically viable. In others, change in regulatory rating was selected as the event to be predicted, in preference to actual bank failure, as it offered the supervisors more time to take remedial action. It was noted, however, that bank supervisors sometimes downgraded the ratings they gave banks on the basis of qualitative information; for example, due to a weakening in the management's systems and controls. Downgrades made for this reason were difficult to predict from financial ratios.

There seemed to be considerable consensus about how the G10 central banks or financial supervisory authorities evaluated the performance of their early warning systems. Virtually all speakers presented their results in terms of Type I errors (eg the failure to predict an actual bank failure) and Type II errors (eg a false prediction of failure when in fact the bank remains in business) and discussed the trade-off between the two.

Iman van Lelyveld presented a paper on how research aimed at assessing the future condition of banks in the Netherlands had evolved in De Nederlandsche Bank. They had tried to develop an early warning system to predict their supervisory ratings. The hope was that it would have both predictive power and serve as a systematic second opinion. The predictions were to be calculated on a quarterly basis (following receipt of banks' prudential returns) and may perhaps have captured adverse developments between the annual ratings. However, after many empirical tests it was concluded that the explanatory power of the models was insufficient. Two explanations were

offered: the role of qualitative information in determining ratings, and the small and heterogeneous nature of the sample of banks on which the models were estimated (including the three large domestic banks and foreign banks' branches and subsidiaries). Instead the research effort had moved on to concentrate on the use of statistical techniques to identify banks that appear to be outliers on the basis of so-called 'key performance indicators'. These are a set of financial ratios derived from bank's prudential reports and information from financial markets. This system will be tested by the end of this year.

Andrew Logan (Bank of England) gave a paper on the small banks crisis in the UK in the early 1990s. The sector was adversely affected by the withdrawal of wholesale funding (following the closure of BCCI) and by the recession. The study investigates whether it is possible to predict from data on banks' balance sheets and other information at two dates (the beginning of the recession and just before the closure of BCCI) which banks would go on to fail in the crisis period.

### Regional economic information

Katherine Samolyk (FDIC) gave a paper summarising an investigation into whether the inclusion of data on regional economic conditions could enhance the accuracy of statistical models predicting which banks would experience difficulties. Three measures of banking difficulty were studied – bank failure, changes in asset quality, and supervisory rating downgrades. All models were estimated with and without the state-level economic variables and the contribution of the economic variables was evaluated in terms of out-of-sample forecast accuracy. The results suggested that adding the state-level economic data did not improve the models' ability to predict bank failures or changes in bank asset quality. Their inclusion did, however, marginally improve the performance of models ranking banks in terms of their risk of supervisory rating downgrades.

These results contrasted with the approach taken in the early warning models presented by Steven Phillips (OCC) and Maurizio Trapanese (Banca d'Italia), where regional data did have a role in predicting failures and mergers of troubled banks in the US and ratings downgrades in Italy respectively.

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3: SCOR is Statistical CAMELS Offsite Rating (and CAMELS is Capital Adequacy, Asset Quality, Management, Earnings, Liquidity, and Sensitivity to Market Risk).

## Performance and the 1990s

Two presentations discussed the impact of the more benign banking conditions in the 1990s on early warning systems. Dan Nuxoll reported that the accuracy of the FDIC's SCOR model had deteriorated over the past decade. Its Type I accuracy (correctly predicting downgrades) had fallen from over 50% in the second half of the 1980s to an average of 23% since 1993 over a four to six month horizon. He argued that this reflected the more benevolent conditions and macroeconomic backdrop in the US in the 1990s relative to the preceding two decades. This may have meant that the effects of excessive risk taking were less likely, or perhaps slower, to come to fruition. Changes in the macroeconomic environment had also prompted the Federal Reserve to alter its early warning system. Their SEER<sup>4</sup> risk rank model was originally re-estimated every quarter using data on banks that had failed in the preceding two years. However, as the number of failures declined this became less accurate, and they switched to a model estimated over the 1985-91 period.

## Integration in the supervisory process

A number of presenters pointed out that one of the major challenges for early warning systems over the past decade has been their integration into the supervisory process. There was a discussion of how a model's output can be made most useful to line supervisors. Kevin Bertsch (Federal Reserve Board) addressed this topic in the context of the Fed's system of banking supervision. The Fed has twice (1994 and 1997) redesigned the report detailing the results of their SEER model to make it more intuitive to bank examiners. Part of the motivation behind the 1997 change was the switch in supervisory focus, in the light of the more benign banking climate, towards identifying which sound banks might develop problems rather than trying to distinguish the weakest of many ailing banks.

## Use of market information

Diana Hancock (Federal Reserve Board) presented ongoing work trying to use market information to monitor the financial condition of larger banks. The objective had been to derive a measure of banks' default risk from their subordinated debt issues. The work focused on the issue's spread over a Treasury security with comparable maturity, after allowance had been made for its special characteristics (eg

call-options and step-ups) and liquidity. It being argued that the latter favoured using large, recent issues, with maturities between ten and twenty years that pay coupons once a year. She showed how a number of US banks' spreads had behaved in the past and illustrated how bond and equity market participants had divergent views of how one bank's riskiness had changed over time, with the spread moving in the opposite direction to a measure of expected default derived from an equity price model. In related work at the Fed, they had also found that there was information in the timing of when banks issued subordinated debt. Risky banks issue less subordinated debt during unfavourable banking conditions than 'safe' banks but issued more in benign periods.

## Conclusion

Central banks and supervisory agencies in a number of countries have had some success in developing early warning systems that provide some indication of banks at risk of developing financial problems. However, the models were imperfect in a number of ways. They were better at predicting problems in small domestically orientated banks and could not predict failures arising from management deficiencies or systems and controls failures which would have to be assessed qualitatively. The benefits that could be derived from accurate early warning systems in terms of helping to focus supervisory and crisis management effort make it likely that development will continue. One possible future area of research may be the inclusion of more market information to supplement bank accounting data in monitoring and forecasting systems.

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4: SEER is System to Estimate Examination Ratings.

# Stylised facts on UK corporate financial health:

## evidence from micro-data

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When firms fail, their creditors usually suffer losses, so anything which increases the likelihood of corporate failure can heighten the risks faced by the banking system. Past studies of corporate distress have established that profitability, gearing and liquidity are important to the chances of company survival. This article looks at the published accounts of over 1000 companies in each year between 1974 and 1998 to investigate how these indicators of financial health changed. It finds that the variation across companies in profitability and margins increased sharply from 1994 and in capital gearing from 1995. Despite the broadly favourable outlook for the corporate sector as a whole, the least profitable companies in 1998 were much less profitable than even the least profitable companies in the recessions of the early 1980s and 1990s. Similarly, the capital gearing of the most highly geared companies reached levels in 1998 not seen in the past quarter-century. These results imply that the downside risks facing creditors of the corporate sector may have been greater in recent years than suggested by aggregate corporate performance alone.

**THE CORPORATE SECTOR** plays an important role in the performance of the real economy and also in the stability of the financial system, through its links with the banking sector and financial markets. This article reviews some measures of the sector's financial health and its robustness to shocks.

In assessing financial stability, the emphasis is on downside risks rather than the most likely outcome. While the entire distribution of indicators of company financial health is reviewed, the focus is on those companies in the tails, since they may be more exposed to financial distress. Measures of central tendency (mean, median, mode, etc) taken across a group of highly heterogeneous companies may fail to capture the position of companies in the tails of the distribution.

Risks tend to be heightened where characteristics typically associated with increased likelihood of failure (eg low profitability and high levels of gearing) are combined. By using micro-data on large samples of individual companies, the evolving distribution of the indicators and their inter-relationships can be described and assessed.

The next section of this article describes some key indicators of financial health, drawing on previous work on the risk of corporate failure. The main characteristics of the data are then presented, focusing on measures of company profitability, gearing and liquidity and the interactions between them. The final section identifies some of the risks to financial stability suggested by the analysis.

### Indicators of financial health

Theory (eg Scott (1981)) and empirics (eg Altman (1983)) show that the likelihood of bankruptcy is broadly determined by profitability, gearing and liquidity. In principle, a firm fails if the value of its assets falls below the value of its debt, while profits are a key determinant of the change in asset value. Liquidity matters because a shock to the balance sheet can occur which could force the firm to adjust its liabilities quickly. Together with its access to further credit, the amount of liquid assets that a firm holds will affect how quickly and efficiently it can make any necessary sudden adjustments<sup>1</sup>.

<sup>1</sup>: While an unused committed line of credit is a substitute for liquid assets, data on unused credit facilities at company level are not available.

Profitability, liquidity and capital gearing variables have been used to assess the financial health of corporates in both developed and developing economies. An extensive literature review is carried out by Morris (1997). Some of the key points are summarised below.

An early study of the financial ratios of failing firms is Beaver (1966). He showed that, for a large number of financial indicators, the mean ratio of failing firms was significantly different from the mean ratio of healthy firms. Using a paired sample, he also examined to what extent a cut-off value of each ratio could discriminate between failing and healthy firms, both within sample and out of sample. The cash-flow-to-debt ratio and return on assets had the best out-of-sample discriminant power.

Beaver's univariate approach was subsequently extended to multivariate models, using linear regression, logit and probit models. For example, Altman's (1968) Z-score model used the following ratios: working capital/total assets, retained earnings/total assets, earnings before interest and taxes/total assets, equity (market value)/debt (book value), sales/total assets. This model was specific to manufacturing companies, and Altman produced later versions designed to apply to all types of business, including private firms. The more general model had the same type-I error, but a higher type-II error<sup>2</sup>.

In the UK, the earliest work was by Taffler (1983) and Marais (1979). Using linear discriminant and linear probability models respectively, they estimated a Z-score model for the UK. The variables used were not as intuitive as those employed by Altman, as they were chosen purely for their discriminant power from a large sample of possible variables using both a step-wise procedure and judgement. However, they still fell broadly into the categories of liquidity, capital gearing and profitability<sup>3</sup>.

The subsequent literature on failure prediction has used an expanded range of techniques, including not only logit and probit models but also artificial intelligence and neural networking techniques (see for example Wilson, Chong and Peel (1995)).

In addition, adjustments to the accounting data are advocated to construct similar, but slightly 'improved', ratios (Altman et al (1977)). While many of these models have much higher discriminant power within sample than the earlier linear models, their out-of-sample performance does not seem to be appreciably better (Morris (1997)). It was also acknowledged and demonstrated (eg Mensah (1984)) that, due to the small samples available of failed firms, discriminant models are in general likely to be overly sensitive to the particular sample of firms and time period chosen.

The important contribution of this literature for our purposes is that high gearing, low liquidity and low profitability appear to lead to an increase in the likelihood of company failure across a variety of models, countries, sample periods and company samples. This motivates their use as indicators of corporate sector financial health.

## Data analysis

### (i) The data

The data are derived from the company accounts of all quoted UK non-financial companies held on the Datastream database, over the period 1974-98<sup>4</sup>. This includes companies that failed at some point during this period. The data covers companies' overseas as well as UK-based operations. Definitions of the variables are set out in the Annex. The companies covered are disproportionately large compared to the total population of non-financial businesses in the UK. In 1998, average sales were £470 million, and ranged from £11,000 to £27 billion. It is also an unbalanced panel, with the number of firms ranging from a high of 1,353 in 1998 to a low of 1,080 in 1992. Aggregate turnover in 1998 was £635 billion, and aggregate gross debt was then £198 billion. In comparison, total UK private non-financial company sector (PNFC) debt in 1998 was £425 billion. Aggregate bank debt for companies in our sample was £66 billion in 1998, compared with total PNFC bank debt of £274 billion. (Of course, for many companies some of the debt will have been borrowed overseas, and so the figures are not directly comparable).

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2: A type-I error is the misclassification of a failed firm whereas a type-II is the misclassification of a non-failed firm.

3: See Bank of England (1982) 'Techniques for assessing corporate financial strength', *Bank of England Quarterly Bulletin*, June.

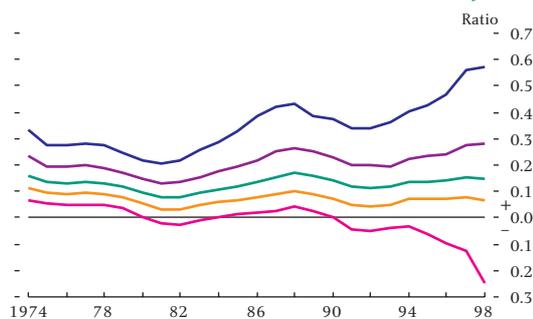
4: A year refers to the accounting year-end.

## (ii) Profitability<sup>5</sup>

Profitability is the most natural barometer of corporate financial health. The two most frequently employed measures are return on capital and profit margins (return on turnover). In equilibrium, the post-tax return on capital is expected to equal the risk-free, real interest rate plus a risk premium, which depends on the business risk of the firm. The level of profit margins is perhaps a better indicator of market power (eg Machin and Van Reenen (1993)).

Chart 1 illustrates the variation in rates of pre-tax return on capital across the firms in our sample, broken down by percentiles. There is a clear decline in the median return on capital (ie return of the median company) during the mid-to-late 1970s, reaching a low in 1981 of 7.8 per cent. The median company's return on capital then recovered, reaching 17.1 per cent in 1988. The recession of the early 1990s was associated with a decline in the median return to 11.4 per cent in 1992, from which point it has increased steadily, to 15.2 per cent by 1997, declining only slightly to 15.0 per cent in 1998. The distribution of post-tax, post-interest return on equity follows a similar pattern, albeit with a greater dispersion.

**Chart 1:**  
Percentiles of distribution of return on capital<sup>(a)</sup>



Sources: Bank of England and Primark Datastream.

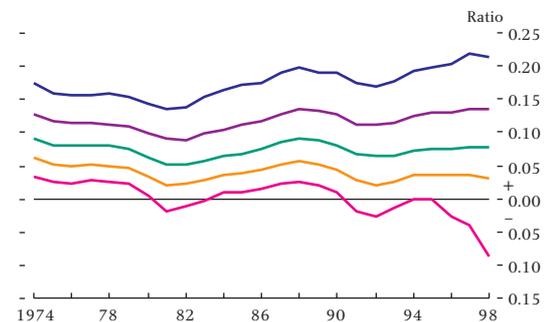
(a) As defined by profit before interest and tax divided by replacement cost of capital. Percentiles are, from top to bottom, 90th, 75th, 50th (median), 25th, 10th.

The path of profitability of the median company masks a great deal of variation. Rates of return at different points in the distribution have in the past tended to move in the same direction. But this general pattern has been reversed over the past four years. The distribution has widened noticeably since 1994, with the increasing return at the upper tail

contrasting with the sharply falling profitability at the lower tail. The rate of return at the 10th percentile has fallen from -3.0 per cent in 1994 to -24.9 per cent in 1998, a striking change in four years.

Chart 2 shows a similar variation in the distribution of operating profit margins since 1974 but, again, especially so since 1994. In 1995, the operating profit margin at the 10th percentile was -0.1 per cent. By 1998 it had fallen to -8.7 per cent. Clearly, companies in the lower tail of the distribution have experienced significantly lower margins in the recent upturn than in either of the past two recessions, during which the margin at the 10th percentile was -1 per cent to -3 per cent.

**Chart 2:**  
Percentiles of distribution of profit margins<sup>(a)</sup>



Sources: Bank of England and Primark Datastream.

(a) As defined by profit before interest and tax divided by total sales. Percentiles are, from top to bottom, 90th, 75th, 50th (median), 25th, 10th.

Looking at other points in the distribution, the margin of the median company between 1995 and 1998 remained stable at 7.5 per cent. At the 90th percentile, the operating profit margin rose slightly – from 19.9 per cent to 21.5 per cent – between 1995 and 1998.

An increase in profitability at the upper tail of the distribution would be consistent with (but does not necessarily entail) an increasing number of companies operating with low asset intensities, as traditionally measured<sup>6</sup>. If so, profitability would reflect returns on intangible assets such as human capital.

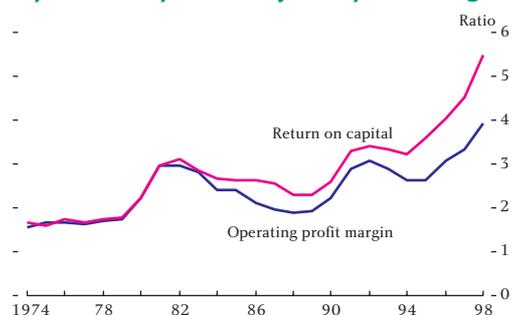
The dispersion in profitability is illustrated more directly in Chart 3, showing the inter-decile coefficient of variation, which is defined as  $\frac{P_{90} - P_{10}}{P_{50}}$

5: Related analysis, but over a shorter sample period, is carried out by Geroski and Gregg (1997) and Smith et al (1994) for the United Kingdom, and Bermanke and Campbell, (1988) for the United States.

6: For a detailed description of the relationship between asset intensity and profitability, see Brealey and Myers (1996), page 303.

where  $P_{90}$  and  $P_{10}$  are the upper and lower deciles respectively, and  $P_{50}$  is the median<sup>7</sup>.

**Chart 3:**  
**Dispersion of profitability and profit margins<sup>(a)</sup>**



Sources: Bank of England and Primark Datastream.

(a) As measured by the ratio of the inter-decile (10th to 90th) range and the median.

Cyclical effects in profit dispersion are apparent. When the economy was growing at its fastest rate in 1978 and 1988, dispersion in profitability was at its lowest, although slightly higher in the latter period. As growth slowed, dispersion started to rise, reaching local peaks in 1981 and 1992 as the recessions were coming to an end. The degree of dispersion also fell during the post-1992 recovery. But after 1994, it increased again. By 1996, dispersion was greater than at the depth of the recession in 1992, on both measures of profitability. By 1998 it was higher still. Possible explanations are discussed below.

Inspection of particular percentiles is not informative about the experience of individual companies from one year to the next. It tells us nothing about the mobility and persistence of a company's profitability. The transition matrix in Table 1 shows the proportion of companies that move from one quintile to another over a period of one year, averaged over 1974-98<sup>8</sup>. The principal diagonal gives the proportions in a particular part of the distribution that remain in that same quintile the following year, on average – a measure of profit persistence.

Table 1 suggests there is a relatively high degree of persistence of profitability, with typically more than half of the companies in a particular quintile remaining in that quintile the following year. Moreover, persistence among very profitable companies (in the top quintile) and very unprofitable

**Table 1: Transition matrix for one-year transitions between quintiles of the distribution of return on capital, 1974-98**

	1	2	3	4	5
Quintile 1	65.2	21.1	6.4	3.1	4.2
Quintile 2	20.0	50.5	22.6	5.4	1.5
Quintile 3	7.9	21.6	46.9	20.7	2.8
Quintile 4	4.1	7.4	21.7	52.3	14.5
Quintile 5	4.7	2.5	3.9	18.7	70.1

companies (in the bottom quintile) is greater than that for the three middle quintiles. Mobility from one quintile to the neighbouring quintiles is greater than to more distant quintiles, as would be expected.

### (iii) Gearing

The first measure of gearing examined is the ratio of net debt to the replacement cost of the capital stock (capital gearing). This is a measure of underlying indebtedness, which is not directly affected by profitability or interest rates.

Income-gearing, on the other hand, is a summary measure of current financial pressure facing a company (see Nickell and Nicolitsas (1999)). It combines information on profits, indebtedness and interest rates. Furthermore, as a flow variable, it avoids the measurement and accounting issues related to a company's assets. Interest gearing needs to be considered alongside its components (profits, debt and interest rates). For example, a company with high interest gearing due to temporarily low profits needs to be distinguished from a company with high interest gearing due to high levels of debt. The former company faces liquidity pressure, which can be resolved quickly as long as the company has access to external financing on reasonable terms. The latter company faces solvency pressure, which can only be resolved by paying down its debt out of profits or by issuing equity to repay debt. Both may be difficult and costly.

### Capital gearing

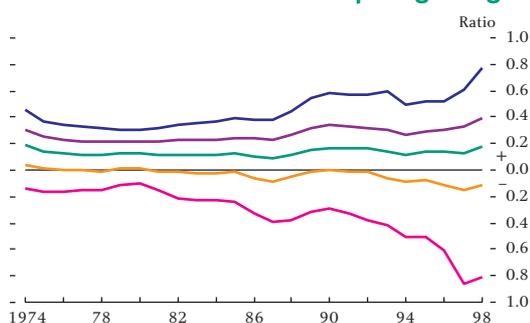
During the late 1980s, there was a rapid rise in corporate indebtedness, which was subsequently

7: The variance is too sensitive to outliers. That may reflect corporate restructuring, which can have large effects on accounting profits via write-offs or charges.

8: Transition matrices based on the last 5 years in the sample (1994-98) were also constructed. The results were similar.

reduced during the recession of the early 1990s. After 1997, median capital gearing began to rise again, reaching a 25-year peak in 1998. The rise in the late 1980s was present across the entire distribution. However, there has also been a pronounced widening in the distribution. The gearing of the most highly geared companies (as measured by the 90th percentile of the distribution) rose from 58 per cent in 1990 to 77 per cent in 1998. This may have implications for financial robustness.

**Chart 4:**  
Percentiles of distribution of capital gearing<sup>(a)</sup>



Sources: Bank of England and Primark Datastream.

(a) Percentiles are, from top to bottom, 90th, 75th, 50th (median), 25th, 10th.

Some of the dynamics in capital gearing are presented in Table 2. Approximately 70 per cent of those companies with very high levels of capital gearing or with very low levels of capital gearing remain in that part of the distribution in the following year, on average. There is again evidence of persistence.

**Table 2: Transition matrix for one-year transitions between quintiles of the distribution of capital gearing, 1974-98**

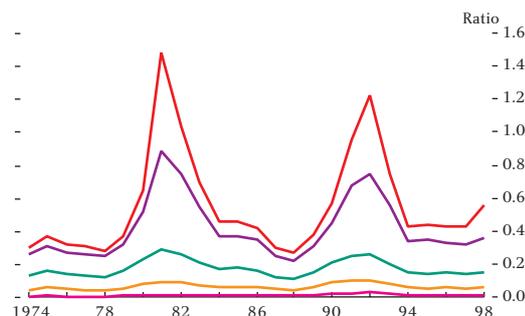
	1	2	3	4	5
Quintile 1	70.3	18.1	4.2	2.6	4.8
Quintile 2	14.6	53.3	22.4	7.2	2.5
Quintile 3	3.4	20.2	47.5	24.0	5.0
Quintile 4	2.4	5.9	22.7	51.1	17.8
Quintile 5	3.9	2.1	4.6	17.8	71.5

### Interest gearing

The cyclical variation in the cross-sectional distribution of income gearing is especially striking.

For example, the gearing level at the 80th percentile increased from 65 per cent in 1980 to 149 per cent in 1981; the median increased from 23.2 per cent to 28.5 per cent, over the same year.

**Chart 5:**  
Percentiles of distribution of interest gearing<sup>(a)</sup>



Sources: Bank of England and Primark Datastream.

(a) Percentiles are, from top to bottom, 80th, 75th, 50th (median), 25th, 10th.

More recently, the rise in interest gearing is more pronounced in the upper half of the distribution; an increase from 43 per cent to 56 per cent at the 80th percentile between 1997 and 1998<sup>9</sup>. Gearing on this measure remains some way below the levels of the early 1980s and early 1990s recessions. But looking just prior to those recessions, interest gearing at the 80th percentile, at 56 per cent in 1998, is similar to its levels in 1980 and 1990, despite much higher nominal interest rates in those two years. LIBOR<sup>10</sup> averaged 16.8 per cent, 14.8 per cent and 7.3 per cent in 1980, 1990 and 1998 respectively.

**Table 3: Transition matrix for one-year transitions between quintiles of the distribution of interest gearing, 1974-98**

	1	2	3	4	5
Quintile 1	76.4	15.9	3.1	1.3	3.3
Quintile 2	14.9	54.5	21.1	5.5	4.0
Quintile 3	2.1	20.6	50.0	20.8	6.5
Quintile 4	0.5	4.6	21.3	52.6	21.0
Quintile 5	2.1	2.8	5.2	22.3	67.7

The dynamics of the distribution of interest-gearing are shown in Table 3. It again suggests significant persistence. More than half of companies in a

<sup>9</sup>: The highest percentile reported is the 80th rather than the 90th, as the 90th percentile was an order of magnitude higher during the past two recessions, distorting the scale of the graph.

<sup>10</sup>: London Inter-Bank Offer Rate.

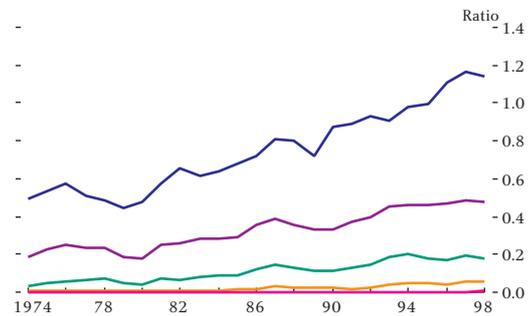
particular quintile remain in that quintile in the following year.

#### (iv) Liquidity

If high indebtedness leads to insolvency due to a sharp decline in asset values, no amount of liquid assets can save a company. However, high indebtedness also tends to be associated, other things being equal, with higher interest gearing. Such companies are vulnerable to sudden changes in cash flows, for example due to increased working capital requirements. There is some evidence that lack of liquidity has been an important cause of business failure<sup>11</sup>. This risk can be partly offset by keeping more liquid assets on the balance sheet as a buffer. One relevant measure is therefore the quantity of liquid assets held against short-term liabilities<sup>12</sup>. Three ratios are commonly used in accounting literature and practice: the current ratio, the quick ratio and the cash ratio. The first is the ratio of current assets to current liabilities. The second and third are more conservative, deducting inventories (quick ratio), and also receivables (cash ratio), leaving only cash and marketable securities in the numerator. The current ratio also varies with changes in efficiency (eg improvement in inventory management) which do not necessarily imply changes in liquidity per se. The analysis below therefore focuses on the cash ratio. The evolution of the distribution of the quick ratio is similar, but higher.

At virtually all points in the distribution, the cash ratio has been trending upwards over time (Chart 6). The cash ratio at the 10th percentile has remained close to zero throughout the sample period. But the cash ratio at the 90th percentile has increased very noticeably, from 49 per cent in 1974 to 117 per cent in 1997. This would appear to be good news from a financial robustness viewpoint. There are two important caveats. First, a full assessment of liquidity would have to take into account unused committed lines of credit available for each company. Second, higher liquidity can only have a positive impact on financial health if the liquid assets are held by the most highly geared companies. This is discussed below<sup>13</sup>.

**Chart 6:**  
Percentiles of distribution of liquidity (cash ratio)<sup>(a)</sup>



Sources: Bank of England and Primark Datastream.

(a) Percentiles are, from top to bottom, 90th, 75th, 50th (median), 25th, 10th.

#### Explaining the distribution of financial performance

So far we have simply described the patterns observed in measures of the financial health of a large number of UK companies. Explaining the patterns is difficult. Some guidance is provided by examining the characteristics of those companies in the tails of the distribution of these indicators.

The appreciation of sterling since November 1995 (according to the exchange rate index) has affected some sectors more than others, depending on the extent to which they are tradeable or not. That could imply a widening of the distribution of profitability. But the increase in the dispersion of profitability is present in both the manufacturing and services sectors.

A second hypothesis is that an increased pace of structural change has intensified the degree of competition. This could be related to the use of technology in reducing entry barriers to certain markets. Companies may differ in the extent to which they have embraced such new technologies. The effect might be felt within sectors as well as between different industries. Indeed, although the widening dispersion in profitability implies an increased risk for those firms with lowest returns, it may be welfare enhancing for the economy as a whole if, for example, it reflects structural change that will eventually lead to productivity gains.

11: A survey by the Society of Practitioners of Insolvency (1999) reveals that lack of working capital and non-paying debtors are increasingly cited by companies as the primary reason for failure.

12: Note that a comparable ratio is not available from National Statistics data, which do not provide a reliable breakdown between current and long-term liabilities.

13: The cross-sectional dynamics of the distribution of liquidity display a similar pattern to that of capital gearing.

**Table 4: Analysis of tails of the distributions in 1998 by industry classification (per cent)**

industry group	1	2	3	4	5	6	7	9
all firms in sample	5	6	15	12	10	18	20	14
firms with low profitability	2	16	10	10	4	9	37	13
firms with low liquidity	1	2	10	21	18	15	20	13
firms with high capital gearing	3	6	8	16	7	11	34	15

Note: industry groups are one-digit non-financial, Standard Industrial Classification (SIC1980) groups.

1. Energy & water supplies; 2. Extraction of minerals & ores other than fuels; manufacture of metals, mineral products & chemicals; 3. Metal goods, engineering & vehicles industries; 4. Other manufacturing; 5. Construction; 6. Distribution, hotels & catering; 7. Transport and communication; 9. Other services.

Table 4 considers the sectoral composition of the companies which in 1998 had the lowest levels of profitability, highest levels of gearing or the lowest levels of liquidity. For this purpose, low profitability and liquidity refers to levels below the 10th percentile while high capital gearing refers to a level above the 90th percentile. The industry classification of the firms in the tails is compared with that of the full sample. While firms with lowest profitability are to be found in each of the broad sectors, the extraction and transport and communication sectors are over-represented relative to their presence in the sample as a whole. Amongst the companies with high capital gearing, it is again the transport and communication sector that is over-represented. In terms of low liquidity, the firms in the other manufacturing and construction sectors are disproportionately present. But generally, each of the sectors is represented to some degree in the upper tails of financial stress.

There is therefore no obvious sectoral pattern to the companies in the tails of the distribution. And single explanations of the decline in profitability at the 10th percentile – such as the appreciation of sterling or the impact of new technologies – do not therefore appear to account wholly for this pattern.

Table 5 compares the size (by turnover) of the firms in the tails with that of the full sample. It is necessary to ensure that these companies are not trivially small. As can be seen from the table, in terms of low liquidity and high gearing, the companies are of similar size to the companies in the sample as a whole, as represented by the median. It appears, however, that companies with low profitability do tend also to be relatively small.

The size distribution of companies covered by Datastream (ie all UK quoted companies) has become marginally more skewed towards smaller companies since 1994. This may be related to the establishment of the Alternative Investment Market (AIM) in 1995, which made it easier for smaller companies to go public<sup>14</sup>.

To the extent that size is positively related to profitability this may partly account for the decline at the 10th percentile of the distribution of company profitability since 1995.

Excluding companies on AIM from our samples alters the magnitude but not the direction of the key results on profitability. Return on capital at the 10th percentile falls to -8.5 per cent in 1998 from -3.0 per cent in 1994. This compares to values of -2.7 per cent in 1982 and -4.7 per cent in 1992. The dramatic decline in margins at the 10th percentile is no longer observed, but margins at this point in the distribution decline to -1.5 per cent in 1998, not far removed from the levels of -1.8 per cent in 1981 and -1.9 per cent in 1991. It is not clear that these companies should be excluded from the analysis but it is useful to note their influence on the results<sup>15</sup>.

**Table 5: Turnover of companies in the tails of the distributions in 1998 (£ million)**

	mean	median
all firms in sample	523	58.9
firms with low profitability	153	8.4
firms with low liquidity	113	42.3
firms with high capital gearing	539	53.9

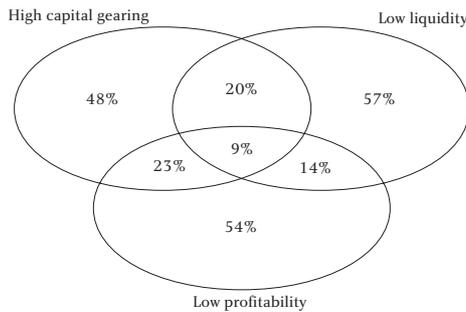
<sup>14</sup>: For a discussion of AIM, see Bank of England (2000) *Finance for Small Firms: A Seventh Report*.

<sup>15</sup>: There is not a large difference in size between the AIM companies and the smaller non-AIM companies. The median sales of the AIM group is similar to the 10th percentile of sales of the non-AIM companies.

## Interactions between indicators of financial health

Thus far, the distribution of each financial ratio has been examined separately. But interactions between ratios are important. From a financial stability perspective, it matters whether the companies with high debt levels are also making losses and/or have low liquidity.

**Chart 7:**  
**Coincidence of financial health indicators in 1998**



Sources: Bank of England and Primark Datastream.

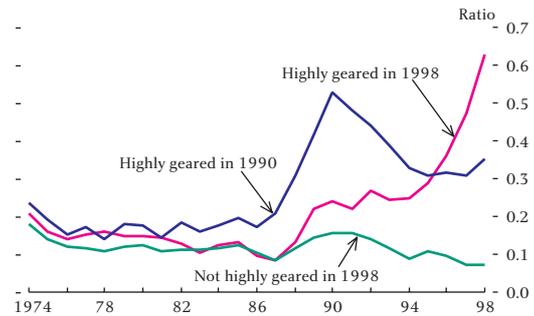
A snapshot of 1998 shows that there are overlaps<sup>16</sup> (Chart 7). One third of companies (ie 23 per cent plus 9 per cent) with the highest gearing also had the lowest profitability. In addition, nearly one third of companies with the highest gearing (although partly a different set of companies from those with low profitability) had the lowest liquidity. As discussed earlier, the interaction of high capital gearing with either low profitability or low liquidity can amplify a company's vulnerability to shocks.

To extend this type of analysis over time the companies are divided into cohorts, which are tracked. Two cohorts of interest are identified: the companies with capital gearing higher than the 75th percentile in 1998 (recently highly geared companies) and, for comparison, the companies with capital gearing higher than the 75th percentile in 1990. This leaves two complementary cohorts: the 'other' companies from each selection. It turns out that the two 'other' cohorts have very similar characteristics. For clarity, only the 1998 'other' cohort is reported.

The following types of question are of interest. How does the experience of the companies that were most highly geared in 1998 compare to that of the most indebted companies in 1990? Have these companies

been more or less profitable than the others? To what extent have increases in the market value of the companies' assets matched the increases in debt?

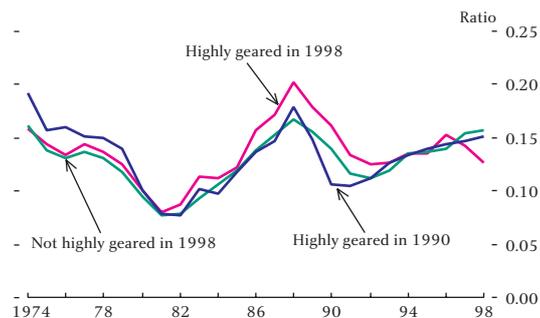
**Chart 8:**  
**Capital gearing by cohort**



Sources: Bank of England and Primark Datastream.

Chart 8 shows that the gearing of the highly geared companies in 1990 had more than doubled over a period of about three years from previously low and stable levels. Similarly, the highly geared companies in 1998 rapidly increased their gearing; in three years the level more than doubled. Their current gearing is higher than the most highly geared companies in 1990.

**Chart 9:**  
**Return on capital by cohort**



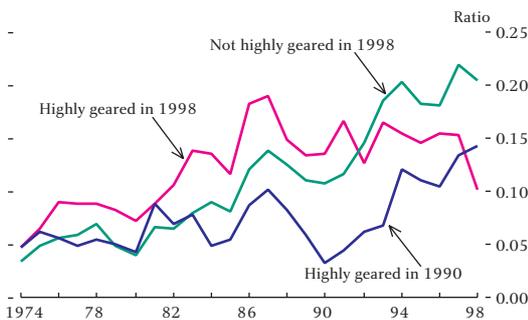
Sources: Bank of England and Primark Datastream.

On the return on capital measure, the 1990 cohort experienced rapid profit growth during the 1980s (Chart 9). This may have been interpreted as a permanent increase, which may partly explain their high gearing strategy. However, during the recession, the 1990 companies experienced a more severe decline in profits than the other companies. This is consistent with the hypothesis that highly geared companies are more likely to be liquidity-constrained in a downturn, which impedes their undertaking

<sup>16</sup> To ensure a reasonable sample size, the 'tail' in this case is defined as companies with profitability and liquidity below the 20th percentile and capital gearing above the 80th percentile.

valuable investment initiatives and hurts profitability (eg Miller, 1993). The 1998 cohort fared even better during the 1980s boom, and maintained a level of profitability similar to the median 'other' company throughout the recession and the subsequent recovery. After 1997, the profitability of the 1998 cohort declined. The rapid increase in gearing for the 1998 cohort was therefore not predicated on above average levels of profitability. A similar pattern emerges when companies are analysed on the operating profit margin measure.

**Chart 10:**  
**Liquidity by cohort**

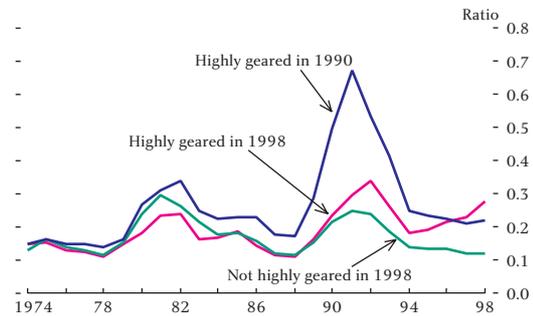


Sources: Bank of England and Primark Datastream.

In terms of liquidity, the 1998 cohort was the most liquid during the 1980s boom (Chart 10). They decreased their liquidity levels during the period 1987-90, as did the 1990 cohort and the median 'other'. However, whereas both the 1990 and 'other' cohort restored liquidity levels in the 1990s recovery, the 1998 cohort did not. Their liquidity level declined gradually, and then rapidly in 1998, so that they are both highly geared and carrying low on-balance sheet liquidity. The same patterns emerge when liquidity is measured by the quick ratio.

Interest gearing – the summary measure of capital gearing and profitability – confirms the pattern in the other ratios (Chart 11). Declining profits, high debt and rising interest rates resulted in a rapid rise in interest gearing in the late 1980s for the 1990 cohort. The 1998 cohort suffered much less during the same period, accounted for by higher profits and lower debt levels. However, the subsequent increase in debt levels by the 1998 cohort was not offset by higher levels of profitability, resulting in a steady increase in interest gearing after 1994.

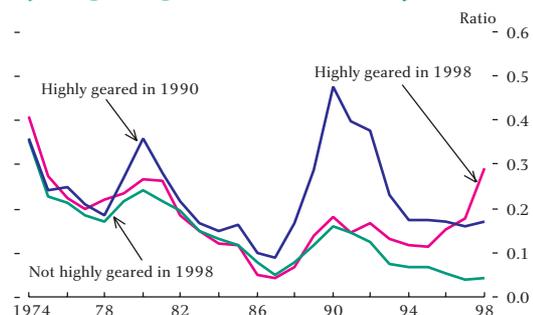
**Chart 11:**  
**Interest gearing by cohort**



Sources: Bank of England and Primark Datastream.

Finally, examining capital gearing using the market value of the company's capital<sup>17</sup> helps to check whether the increase in debt levels was matched by an increase in equity values, which may reflect higher expectations of future profits or the presence of intangible assets which are not capitalised in the balance sheet. This does not appear to be the case. The increase in gearing is of a similar magnitude whether measured relative to market values or relative to replacement cost (Chart 12). This contrasts with the rather more benign picture that emerges from aggregate data: aggregate capital gearing on a market value measure for the corporate sector has been falling steadily since 1991, reflecting strong equity markets.

**Chart 12:**  
**Capital gearing at market values by cohort**



Sources: Bank of England and Primark Datastream.

In conclusion, the companies that were highly geared in 1998 geared up in a short period of time from much lower levels. Their profits outstripped those of other companies, but the difference was not maintained during the mid 1990s. They have operated with a lower and falling level of on-balance sheet liquidity compared to other companies. The increased gearing levels do not seem to be predicated on higher

<sup>17</sup>: Note that the cohorts are still the same, ie they are still selected on the basis of capital gearing on a replacement cost measure of capital.

expected profits or the presence of intangible assets, as gearing has also increased relative to the market value of assets. To be more precise, if the increased gearing levels for this group of companies were predicated on higher expected profits, the equity market has not valued the future profits as highly as the companies themselves. Alternatively, companies may simply have decided to operate with higher levels of debt finance. In either case, this group of companies may be vulnerable to a slowdown. Companies that were in a similarly vulnerable position in 1990 suffered a sharper decline in profits and a steeper increase in interest gearing levels than other companies<sup>18</sup>.

A mitigating factor may be that the wider range of debt instruments and borrowing facilities available to firms, as well as deeper financial markets, have made it possible to operate with higher levels of debt without a commensurate increase in risk. It is too early to judge whether or not this is the case.

Ideally, one would know how many of the companies which, on the basis of these measures, were vulnerable in 1990 failed during the recession. Unfortunately, such information is not yet available in a systematic way. The reasons for a company's disappearance from the database cannot be identified. A company may disappear due to insolvency, but also through de-listing or a reverse takeover. The following statistics therefore have to be interpreted with caution. The total number of reporting companies, existing in 1990, that disappeared from our sample during the period 1990-93 was 157. Of these, 80 belonged to the cohort of most highly geared companies in 1990. If such exits were unrelated to gearing in 1990, only 39 companies (25 per cent) would be expected to belong to the 1990 cohort. This therefore provides some informal support for the concern that the high gearing level of these companies proved unsustainable in the sharp downturn of the early 1990s. The total number of surviving companies from the 1990 cohort is given in the table below:

**Table 6: Number of companies highly geared in 1990 remaining in the sample**

1990	1991	1992	1993	1994	1995	1996	1997	1998
300	260	240	220	207	196	182	170	153

<sup>18</sup>: The patterns described in this section on cohorts are also present when the analysis is restricted to the subset of companies that are there for each of the 25 years.

## Conclusions

Micro-data on large numbers of individual companies can help to describe the evolving financial health of UK companies. Examination of data covering the past 25 years suggests some potential risk to financial robustness in the corporate sector.

- The distribution of profitability has widened in recent years despite a macro-economic environment which, on the whole, has improved. This contrasts with the previous pattern of the spread of the distribution narrowing in an upturn. The profitability at the lower tail of the distribution in 1998 is lower than at any other point in the 25-year period reviewed for our sample of quoted companies.
- The distribution of capital gearing has also widened. Gearing levels in 1997 and 1998 for the upper and lower tails of the cross-sectional distribution both reached levels not otherwise seen during the period.
- Companies with the highest gearing levels in 1998 have not been more profitable than others. Furthermore, these companies have experienced a similar increase in gearing levels whether measured against market values or replacement cost. Increased gearing levels do not therefore seem to be predicated on actual higher profits, or on the market's expectation of higher profits.
- Although on-balance sheet liquidity levels have increased across the distribution, the liquidity of highly geared companies seems to have fallen since 1995. This may add to their vulnerability to shocks and so to the level of financial fragility.

The emphasis here, though, is on downside risks rather than on the most likely outcome. It is too early to judge whether or not changes in the environment have made it possible for companies to operate prudently with higher levels of debt than in the past. That, and other related indicators of corporate sector robustness, merit continued monitoring – by the firms themselves and their advisers and bankers, as well as by the authorities.

## Variable definitions

### (Datastream account items given in parentheses)

**Capital:** fixed assets (327+328+329) + net current assets excluding cash (376-389+309-375)

(Note: fixed assets at book value are adjusted for inflation and economic depreciation using the perpetual inventory method in order to obtain a replacement cost measure. The method of Nickell et al (1992) was followed.)

**EBIT:** earnings before interest and taxes (157+153-143)

**Net debt:** short term debt + long term debt – cash (309+321-375)

**Return on capital:** EBIT/capital. Note that EBIT is a proxy for trading profit, rather than economic profit, which would include holding gains of the capital stock. This measure is therefore a compromise between economic profitability and book value profitability (EBIT/capital at book value). As a robustness check, book value profitability was also examined. It did not affect the results.

**Capital gearing:** net debt/capital

**Capital at market value:** 309+321+312-375+307-305+1000\*MV

**Interest gearing:** interest paid/(EBIT+interest received)

**Cash ratio:** cash/current liabilities (375/389)

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# A possible international ranking for UK financial stability

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What are the most important countries to track when assessing potential threats to UK financial stability? The issue is complex, because there are many channels through which shocks abroad could affect the United Kingdom; particularly given the scale and range of financial market activity in London. There is no widely accepted model for identifying and calibrating risks to financial stability so judgments of relative importance are often *ad hoc*. This article discusses the results of one method, which ranks countries according to estimates of the 'expected default loss' facing UK-owned banks. The vulnerability or robustness of UK institutions to these losses from overseas is, of course, a separate issue. Availability of data constrains this exercise to UK bank exposures.

**ECONOMIC AND FINANCIAL DEVELOPMENTS** in foreign countries can affect UK financial stability in a number of ways. Given the potential for such spillovers, the Bank monitors risks to stability and financing capabilities around the world – reported, for example, in the *Assessment* section of the *Financial Stability Review*.

Weighing these international risks requires judgments about the **likelihood** of disruptive events in different countries and about their **impact** on UK financial institutions and markets. These judgments are complex, but important, and they need to be made consistently across countries. There is, however, no widely accepted model of financial stability. For that reason, there is some merit in developing a systematic 'baseline' ranking of economies in terms of their potential importance for financial stability in the United Kingdom.

This article discusses one possible approach, based on the direct credit risks attaching to the UK financial system's external claims. It derives an estimate of 'expected default losses' from external claims and ranks the various economies on that basis.

The 'expected default losses' do not, of course, describe the full financial stability implications of banks' losses on individual exposures. The impact is

also affected by banks' pricing and provisioning policies; the extent of banks' capital; and the degree to which realised losses on one loan are offset by profits on others. More generally, as noted in previous editions of the *Financial Stability Review*, surveillance of risks to financial stability has many dimensions. The measure discussed here focuses on the potential **magnitude** of expected default losses on UK institutions' balance sheets. The **vulnerability** of UK institutions to these shocks is another dimension<sup>1</sup>.

There are also several important caveats. In particular, availability of data on external claims limits the scope of this exercise to the on-balance-sheet exposures of UK-owned banks. As a result, the rankings can only be a first approximation – a baseline estimate to complement assessments based on a broader range of factors; and a focus for future research priorities.

## Method

The approach developed in this article ranks economies on the basis of the 'expected default loss' faced by UK-owned banks. 'Expected default loss' (EDL) is calculated by multiplying the size of exposures and the 'credit risk' attaching to them.

$$\text{EDL} = \text{exposure} * \text{credit risk}$$

<sup>1</sup> The way in which default and its potential is reflected in banks' published accounts is a further dimension. Jackson and Lodge discuss one element of accounting standards in 'Fair Value Accounting, Capital Standards Expected Loss Provisioning and Financial Stability' in this issue of the *Financial Stability Review*.

In turn, 'credit risk' reflects the probability of default and expected recovery in the event of default. For example, if the UK banking system has lent US\$1 billion to Ruritania and there is a 10 per cent chance of default, the 'expected default loss' on the loan would be US\$100 million if no recovery was expected and US\$50 million with 50 per cent recovery.

### (i) Exposure to loss

Ideally, the UK external exposures would be measured in terms of the full range of assets and counterparty credit exposures of all UK financial institutions.

These are wide-ranging:

- foreign credit exposures are incurred through holdings of many different types of asset – bank loans, government and corporate bonds, equities, derivatives and direct investments.
- they are incurred not just by banks but also by, for example, institutional investors and non-financial institutions.
- there are a number of possible channels through which shocks to foreign economies might affect the balance sheets of UK institutions. For example, in the event of a default in one country, UK banks would face a direct loss on loans to that country; but additionally, the probability of losses on loans to other countries may increase if the initial default triggers further financial instability elsewhere.
- credit risk is not the only risk faced by financial institutions. In particular, mark-to-market losses may be incurred when the price of underlying assets changes.

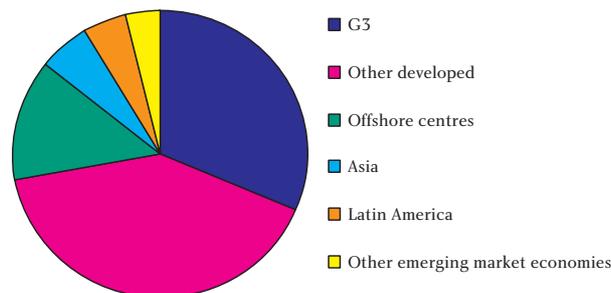
In practice, consistent data are available for only a subset of financial institutions and assets – the on-balance-sheet external claims of UK-owned banks<sup>2</sup>. There are no comprehensive, consistent and timely data on the external claims of non-bank financial institutions.

At end-December 1999, the external claims of UK-owned banks totalled US\$473 billion. This

compares with total on-balance-sheet assets of UK-owned banks of US\$4,265 billion.

UK-owned banks' external claims cover the range of on-balance-sheet assets – capital market investments as well as loans. The risk of mark-to-market losses may be greater on portfolio investments, which accounted for around a third of UK-owned banks' total external claims at end-December 1999.

**Chart 1:**  
UK-owned banks' external claims, end-December 1999



Source: Bank of England.

Chart 1 shows the distribution of external claims by region. UK-owned banks' external claims are dominated by the G3 economies: the United States, Germany and Japan together account for 31 per cent of external claims. The other 27 developed countries account for a further 40 per cent, while offshore financial centres<sup>3</sup> account for a further 14 per cent. The remaining 14 per cent of external claims relate to the many emerging market economies (EMEs); exposures to Asia and Latin America are more significant than exposures to Eastern Europe.

The external claims of UK-owned banks cover claims on a variety of borrowers – public sectors, banks, corporates and, to a much lesser extent, individuals. Table 1 shows the sectoral distribution of UK-owned banks' claims on 10 developed countries<sup>4</sup>.

For all developed countries, except Italy, public sector exposures are less than one-third of the total. In most countries, the largest exposure is to the banking sector. Major exceptions are the United States, Canada and Australia, where exposures to corporates

<sup>2</sup>: There are also data for the external claims of banks located in the United Kingdom.

<sup>3</sup>: Offshore centres are as defined by the Bank for International Settlements (BIS) and reported in the consolidated bank lending statistics. This definition includes, *inter alia*, Hong Kong and Singapore.

<sup>4</sup>: The countries included are those on which UK-owned banks had the largest external claims at end-December 1999.

**Table 1: Sectoral distribution of UK-owned banks' claims on 10 developed economies (percentage of total, end-December 1999)**

Country	Public sector	Banks	Corporates/ individuals
United States	14	28	58
Germany	7	78	15
France	12	67	21
Italy	42	53	6
Japan	31	49	20
Australia	2	36	62
Netherlands	11	55	34
Belgium/ Luxembourg	9	83	8
Canada	19	29	52
Ireland	2	61	38

Source: Bank of England.

make up more than half of the total. Table 2 gives a similar sectoral breakdown for the EMEs and offshore centres (OFCs). Exposure to the public sector is less than half the totals and is much less in the case of the OFCs.

**Table 2: Sectoral distribution of UK-owned banks' claims on other regions (percentage of total, end-December 1999)**

Region	Public sector	Banks	Corporates/ individuals
Asia	13	36	51
Latin America	36	28	36
Eastern Europe	46	25	29
OFC	1	41	57

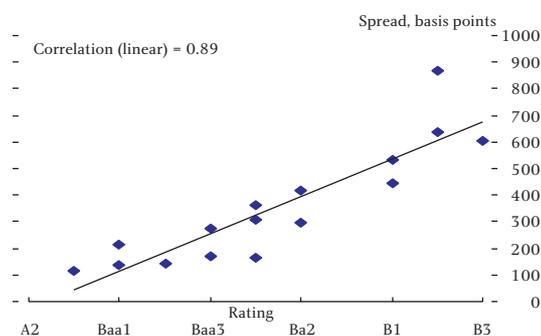
Source: Bank of England.

## (ii) Credit risk

Two 'mechanistic' measures of credit risk are considered. They are mechanistic in the sense that they are based on *private-sector* assessments of credit risk rather than *subjective internal* assessments. Market perceptions will, in principle, be based on all available information and factor in anything likely to affect credit risk. In addition to domestic factors such as fiscal stance and political stability, external links (for example, through trade) may affect the yield spread and the credit rating.

One measure uses the secondary market spread on US dollar-denominated bonds; the second is based on credit ratings. There are methodological problems with both, as discussed below. But they give (perhaps not surprisingly) broadly similar indications of relative credit risks. This is shown in Chart 2, which plots sovereign credit ratings against sovereign yield spreads for 16 EMEs. The chart shows a snapshot at end-December 1999, but the strong correlation has been observed for some time.

**Chart 2: Yield spread and credit ratings for emerging economies, end-December 1999**



Sources: Moody's, J P Morgan and Bloomberg.

For the EMEs, a measure of sovereign risk is used to proxy risks on all exposures. A large part of UK-owned banks' claims on EMEs is to banks and corporates. So relying on sovereign ratings is clearly an approximation, which is likely to bias estimates of the probability of default downwards if sovereigns are seen to be less risky. This is the case, with only around 40 per cent of all Moody's ratings in the ten largest EMEs<sup>5</sup> being as high as the sovereign rating. Sovereign credit risk is likely to be an even poorer approximation of economy-wide credit risk when private debt is less likely to bear an implicit government guarantee.

No explicit allowance is made for covariance between defaults by individual borrowers within countries. Instead, a single average credit risk is calculated for each country and applied to exposures in aggregate.

### *Yield spreads-based approach*

A financial market-based measure of credit risk is derived from the yield spread<sup>6</sup>. Subject to a number of assumptions, the spread is directly related to market

<sup>5</sup> The 10 EMEs are those on which UK-owned banks had the largest external claims at end-December 1999.

<sup>6</sup> The difference between the yield on an emerging economy sovereign bond and that on a risk-free asset (both denominated in US dollars and with similar maturities).

perceptions of (annual) credit risk. The annex sets this out more formally. For a number of reasons (see caveats below), the inferred measure of credit risk is likely to be an overestimate.

Chart 3 plots the evolution of the implied credit risk for the upper and lower quartiles of EMEs<sup>7</sup>. The key features are the increase in the level and dispersion of perceived credit risk following the Russian crisis in August 1998; and the gradual fall in perceived credit risk since then.

This market-based measure of credit risk ignores a number of issues. It makes no allowance for the fact that investors may be risk averse or that the spread compensates for low liquidity as well as credit risk. This biases the spread-based measure of credit risk upwards. Furthermore, premia for these factors may vary between countries and hence affect the ranking of countries derived using this method.

**Chart 3:**  
**Implied credit risk derived from yield spreads**



Sources: J P Morgan, Bloomberg and Bank calculations.

For the developed countries and OFCs, a sovereign spreads-based approach is not appropriate. Developed country borrowers typically issue debt in their own currencies; and the governments of OFCs have not issued much foreign currency debt.

### Credit ratings-based approach

Ratings agencies assess the risks attached to bond issues and also publish details of the past performance of borrowers in the different ratings categories. From these, it is possible to derive an

average annual default probability for each rating. This ignores the potential for recovery in the event of default, which will bias estimates of credit risk upwards.

In addition to ignoring potential recovery, this use of ratings makes an important assumption. Using past default experience to calculate credit risk for all exposures assumes that the ratings agencies' judgments are consistent over time and across borrowers in different countries. This assumption may not hold in practice<sup>8</sup>.

In practice, the average annual default probability is sensitive to the maturity of the exposures, though the rankings themselves are robust to the choice of maturity<sup>9</sup>. Here, we assume that exposures have a maturity of five years. Table 3 sets out the annual probabilities of default by Moody's rating.

**Table 3: Ex post default rates for bonds of different ratings**

Investment grade		Speculative grade	
Rating	Default rate (per cent pa)	Rating	Default rate (per cent pa)
Aaa	0.04	Ba1	1.64
Aa1	0.05	Ba2	1.77
Aa2	0.09	Ba3	3.88
Aa3	0.08	B1	4.48
A1	0.13	B2	5.13
A2	0.12	B3	6.58
A3	0.08	Caa1-C	7.47
Baa1	0.25		
Baa2	0.36		
Baa3	0.56		

Sources: Bank calculations and Moody's.

For the EMEs, the method is simply to evaluate credit risk on the basis of the sovereign credit rating. So, for example for Brazil, the B2 sovereign foreign currency ceiling is applied to all exposures (public and private), giving an annual default probability of 5.1 per cent.

<sup>7</sup>: Countries from J P Morgan's EMBI Global, minus Russia and Greece, plus India and Indonesia.

<sup>8</sup>: For example, there is a potentially important difference between sovereign and private default, because sovereign default is affected by willingness as well as ability to repay. The information content of credit ratings is discussed in some detail in Jackson and Perraudin, (1999) 'The Nature of Credit Risk: the Effect of Maturity; Type of Obligor and Country of Domicile', *Financial Stability Review*, Bank of England, Issue 7.

<sup>9</sup>: For example, there is a near-perfect correlation of 0.98 between the rankings of the 20 highest-ranked EMEs using two- and five-year default rates as the basis for the annual default probability calculations. The average maturity of all bonds issued in 1998 was around eight to nine years; but bank loans are typically of shorter maturity; hence our assumption of five years.

For the developed countries, the ratings are split by sector. For *public-sector* exposures, the sovereign rating is adopted. This assumption may underestimate credit risk where exposures are to local governments or public corporations and agencies that do not bear a guarantee from the national government.

Banks from developed countries are assigned a rating typical of the Moody's bank deposit rating for that country. This is A grade for all countries except Greece and Japan (Baa2) and the Netherlands, France, Germany, Canada and Austria (Aa2)<sup>10</sup>. Developed country financial systems are discussed in the *Assessment* section of this *Review*.

For *corporates*, the working assumption is a Ba2 rating for all developed countries. This is in line with the average rating of US corporates<sup>11</sup>. The reason for assigning the same rating across countries is lack of data: there are very few rated corporates outside the United States. Use of average ratings may understate corporate riskiness, because firms that are unable to access the bond markets may be less risky than firms which rely on other sources of financing<sup>12</sup>.

The need for sweeping assumptions to gauge the credit risk attaching to corporate exposures highlights an area for future research. The assumptions have a significant impact on the level of expected default losses, but the rankings themselves are robust to some changes in assumptions.

## Results

Given the different assumptions made, this section begins by considering the developed countries, EMEs and OFCs separately. It then discusses a ranking for all exposures together.

### (a) Developed countries

Table 4 lists the 15 highest-ranking developed countries, using the credit ratings-based approach to evaluate credit risk. Overall, for developed countries, the pattern of expected default loss tends to follow the size of exposure. The rankings have changed slowly over time. The total expected default loss for

the 15 highest ranking economies, calculated in this way, is US\$2.2 billion.

**Table 4: End-December 1999 ranking of developed countries (ratings based)**

Country	Expected default loss (US\$millions pa)	Exposure (US\$millions)	Credit risk (per cent pa)
1 United States	1,018	95,208	1.1
2 Australia	199	17,383	1.1
3 Canada	146	15,145	1.0
4 France	126	28,852	0.4
5 Japan	117	21,318	0.6
6 Netherlands	112	16,893	0.7
7 Germany	102	29,772	0.3
8 Ireland	68	9,175	0.7
9 Switzerland	63	7,693	0.8
10 Spain	56	8,424	0.7
11 Greece	51	5,033	1.0
12 Italy	51	26,474	0.2
13 Belgium/ Luxembourg <sup>(a)</sup>	46	18,863	0.2
14 Sweden	30	7,664	0.4
15 New Zealand	25	2,062	1.2
<i>Memo: Euro area</i>	<i>583</i>	<i>148,100</i>	<i>0.4</i>

Sources: Bank of England and Moody's.

(a) Belgium and Luxembourg operated a single monetary authority prior to the inception of the European Monetary Union.

The expected default loss from exposures to the United States is much higher than from exposures to other developed countries. In part, this follows simply from the higher absolute exposure – over three times that to Germany, for example. But the credit risk is also higher, as a result of the larger (relatively risky) exposures to the corporate sector. The high rankings of Australia and Canada also reflect the high proportion of exposure to corporates.

Germany has the lowest ranking of the G3 economies because the bulk of UK-owned banks' exposures to Germany are to banks, which are typically rated higher than the average corporate. Similarly, Italy and Belgium/Luxembourg have low credit risk because of

<sup>10</sup>: It is possible that use of typical ratings overstates the relative riskiness of US banks – for example if a larger proportion of smaller and relatively risky banks are rated in the United States than elsewhere. This would bias the rankings if UK banks have exposures to the full range of banks (rated and unrated).

<sup>11</sup>: This average was derived over a random sample of 198 US corporates rated by Moody's. The average of all US corporates rated by Standard & Poor's is broadly equivalent at BB+.

<sup>12</sup>: See Davis, E P and Mayer C P (1991), 'Corporate Finance in the Euromarkets and the Economics of Intermediation', CEPR Discussion Paper, No. 570, who show that bond issues are typically made by highly rated companies, while the average credit quality of borrowers in the syndicated credits market is significantly lower.

the predominance of exposures to the public and banking sectors. As a result, they rank below several economies to which UK banks have smaller credit exposures. The euro area as a whole also has low credit risk, which makes it second to the United States in terms of expected default loss, despite an overall exposure more than 50 per cent larger.

### (b) Emerging market economies

Tables 5 and 6 set out the expected default losses for UK-owned banks on exposures to the 10 highest-ranking EMEs, using both the credit rating and yield spread approaches.

The choice of method for evaluating credit risk has only a limited impact on the *ranking*. Over a sample of 18 EMEs<sup>13</sup>, the correlation between the two rankings is high at 0.89. The choice of method does, however, have an impact on the *level* of expected default losses. The total EDL from exposures to the top ten emerging economies is roughly the same as that from the United States, at US\$1.1 billion under the ratings approach. For the same countries, it is US\$1.5 billion under the yield spreads approach; despite the fact that market spreads should make allowance for recovery in the event of default. This difference probably follows from the bias due to risk aversion and illiquidity embedded in yield spreads. The difference between the two estimates of the level of credit risk is greatest for the two most risky countries: Russia and Ecuador where spreads were more than three times the EME average at end December 1999.

**Table 5: End-December 1999 ranking of EMEs (rating based)**

	Expected default loss (US\$millions pa)	Exposure (US\$millions)	Credit risk (per cent pa)
1 Argentina	288	6,444	4.5
2 Brazil	235	4,577	5.1
3 Indonesia	211	3,203	6.6
4 Mexico	87	5,303	1.6
5 Turkey	84	1,881	4.5
6 Venezuela	68	1,332	5.1
7 Russia	44	667	6.6
8 India	37	2,085	1.8
9 Ecuador	37	493	7.5
10 Philippines	24	1,490	1.6

Sources: Bank of England and Moody's.

For both the ratings and yield spreads approaches, the range of implied credit risk is much broader than for the developed countries. As a result, patterns in credit risk are important in driving the rankings.

Turning to the country rankings, in general Latin American economies rank highly because of the conjunction of relatively high credit risk with large exposure. Argentina, Brazil and Mexico rank in the top five under both approaches.

**Table 6: End-December 1999 ranking of EMEs (spread based)**

	Expected default loss (US\$millions pa)	Exposure (US\$millions)	Credit risk (per cent pa)
1 Argentina	307	6,444	4.8
2 Brazil	259	4,577	5.7
3 Mexico	174	5,303	3.3
4 Indonesia	172	3,203	5.4
5 Russia	124	667	18.6
6 Ecuador	118	493	24.0
7 Venezuela	100	1,332	7.5
8 Turkey	75	1,881	4.0
9 S Korea	68	5,106	1.3
10 India	57	2,085	2.7

Sources: Bank of England, J P Morgan and Bloomberg.

Russia, Turkey and India are in the ten largest risk exposures under both measures. So is Indonesia, where there is seen to be significant credit risk. Exposures to other Asian crisis economies are ranked lower. South Korea is amongst the highest ten risk exposures on the spreads-based ranking but not on the ratings-based approach. South Korean sovereign-bond spreads have narrowed and ratings have been upgraded several times during the rapid recovery. The same is true (to varying degrees) for Thailand and Malaysia.

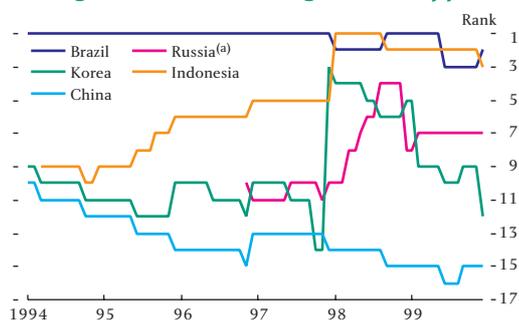
An interesting feature of the rankings is that China is not amongst the highest ten risk exposures under either approach, while India is under both. In practice, the international financial community has probably been more concerned about Chinese risk than Indian risk in recent years, reflecting in part the close financial and economic links between mainland China and Hong Kong. UK-owned banks had claims of US\$5.3 billion on China at end-December 1999,

13: Those EMEs for which both ratings and sovereign yield spreads were available.

and additional claims of some US\$25 billion on Hong Kong.

The expected default losses have changed over time, as UK-owned banks' external claims fluctuated and credit risk varied. In June 1996, the total expected default loss from the 20 largest EMEs (for whom ratings histories are available) was US\$0.5 billion on the ratings approach. This rose to US\$1.4 billion in December 1998, principally following ratings downgrades, before falling back to US\$1.2 billion at end-December 1999. The rankings have also shifted over time. Chart 4 plots the rankings of a selection of emerging market economies over time under the ratings approach.

**Chart 4:**  
**Rankings over time – ratings-based approach**



Sources: Bank of England and Moody's; Bank calculations.

(a) Russia was not rated until late 1996.

The South Korean and Indonesian risk-exposure rankings rose sharply in late autumn 1997, while Russia's ranking increased significantly in August 1998. South Korea's ranking fell quickly through 1998 and 1999, while Indonesia's has remained high. This suggests that the rankings have reflected changes in perceived financial stability risk.

However, the method is no better as an early warning indicator of crises than the measures of perceived credit risk it uses. For example, at the end of 1996, South Korea was ranked tenth, Indonesia was fifth and Thailand just 15th. Based on recent evidence, neither the financial markets nor the ratings agencies gave significant early warning of the risks in exposures to these countries.

#### (c) Offshore financial centres

The UK bank-lending data cover twelve countries that are classified as OFCs. Exposures to these individual

OFCs are significant. For example, UK-owned banks' external claims on Hong Kong were US\$25 billion at end-December 1999, just less than claims on Italy (US\$26 billion). However, sovereign credit ratings (when available) are typically high, so that using sovereign ratings as a proxy for risk to all sectors generates very low estimates of credit risk. For example, Hong Kong's sovereign risk is rated A3, generating annual credit risk of less than 0.1 per cent and hence expected losses of US\$20 million.

The estimates of credit risk might be enriched by examining the sectoral breakdown of claims on offshore centres (57 per cent corporate at end-December 1999, see Table 2 above). However, properly evaluating the credit risk attached to any exposures to OFCs is a complex area of ongoing research<sup>14</sup>. An important issue is where the final risk from claims on OFCs lies. For example, monies lent to banks in OFCs (such as Singapore) may be on-lent to companies operating in other economies.

#### (d) Global comparison

Table 7 lists the 15 highest-ranking economies; using the ratings approach to evaluate credit risk.

**Table 7: Expected default loss ranking of all economies, end-December 1999 (rating-based)**

	Expected default loss (US\$millions)	Exposure (US\$millions pa)	Credit risk (per cent pa)
1 United States	1,018	95,208	1.1
2 Argentina	288	6,444	4.5
3 Brazil	235	4,577	5.1
4 Indonesia	211	3,203	6.6
5 Australia	199	17,383	1.1
6 Canada	146	15,145	1.0
7 France	126	28,852	0.4
8 Japan	117	21,318	0.6
9 Netherlands	112	16,893	0.7
10 Germany	102	29,772	0.3
11 Mexico	87	5,303	1.6
12 Turkey	84	1,881	4.5
13 Venezuela	68	1,332	5.1
14 Ireland	68	9,175	0.7
15 Switzerland	63	7,693	0.8
<i>Memo: Euro area</i>	<i>584</i>	<i>148,100</i>	<i>0.4</i>

Sources: Bank of England and Moody's.

<sup>14</sup> See, for example the Financial Stability Forum's 'Report of the Working Group on Offshore Financial Centres', 2000, <http://www.fsforum.org/reports/repofc.html>.

The United States ranks highest in terms of expected default loss. This is unsurprising since exposure to the United States is more than one and a half times the exposure to all emerging market economies put together. However, it is striking that six of the 15 highest-ranked countries are EMEs. The relatively high credit risk attached to exposures to the EMEs outweighs their smaller relative exposures. The global ranking displays far less correlation with both the level of exposure and credit risk than the rankings within the developed or emerging economies.

### Caveats

There are several important caveats associated with the approach developed in this article. In part, these reflect behavioural assumptions underlying the approach and in part they reflect limitations in the techniques and methods used.

The most important issue is how to interpret the rankings. They are based on a measure of expected default loss and so are informative about the potential impact on UK-owned banks' balance sheets. The measure does not say anything about the resilience of banks (or other financial institutions) to these shocks.

Moreover, threats to an individual bank's stability probably have as much to do with the probability **distribution** of losses as with their expected value. For example, a small probability of large losses may have a greater impact on the potential for survival than a large probability of small losses. And expected losses should, on the whole, be less damaging than large unexpected losses, assuming that banks set aside provisions or capital against losses which they expect.

Threats to the UK financial system as a whole may be affected by the distribution of any losses amongst individual banks. The rankings are based on the exposures of all UK-owned banks in aggregate and do not distinguish between exposures that are spread over a number of UK-owned institutions and those that are more concentrated. However, data on bank-by-bank exposures are not published.

#### (a) Behavioural

The main behavioural caveats concern the relationship between our estimate and the 'true' level of expected default losses. These caveats affect the risk-exposure rankings to the extent that they affect the pattern (rather than the absolute level) of the expected losses. They include the following:

- (i) Banking sector losses are assumed to be representative of losses incurred by the financial system as a whole. If other financial institutions have materially different exposures or vulnerabilities from those of banks, the 'true' rankings may be different.
- (ii) The approach focuses on on-balance-sheet credit risk and so ignores a number of other risks. These include market and liquidity risks; counterparty credit exposures on off-balance sheet contracts; contingent claims and any payment or settlement risks to UK investors trading in overseas securities.
- (iii) The ranking ignores the possibility that default in one country may affect the ability of banks in other countries to maintain payments to UK banks – that is, third country effects.
- (iv) The approach makes some allowance for contagion, because the risk of contagion will affect market perceptions of any one country's credit risk. But we cannot calibrate the implied covariance between defaults in various countries from the credit-risk estimates. In other words, we cannot say anything about the potential for defaults to bunch.

#### (b) Technical or methodological

There are also several technical and methodological caveats. These include the following:

- (i) The use of yield spreads to make inferences about perceived credit risk is rudimentary and imparts an upward bias. It ignores risk and liquidity premia for which markets will require some additional compensation. This bias is probably greater the higher the 'true' credit risk and during periods of financial distress, when risk and liquidity premia may rise sharply. The bias may vary across countries. It also assumes that the average rate of credit risk derived from EME sovereign bonds used is representative of credit risk attaching to exposures of all maturities and to all sectors.
- (ii) The ratings-based approach also imparts an upward bias because it ignores the potential for recovery in the event of default.
- (iii) The omission of potential recovery in the ratings-based approach may bias the comparison between developed and emerging economies. It is possible that recovery will be greater in developed

countries – for example if bankruptcy procedures are more efficient. A ratings-based ranking could therefore overstate the expected default losses for the developed economies relative to the EMEs.

- (iv) The exposure data used are not compiled on the basis of ultimate risk<sup>15</sup>, since these data are not published on the sectoral basis needed to calculate the developed economy rankings. However, for the EMEs, ranking on the basis of ultimate risk does not change the conclusions significantly. Using the spreads-based measure, the two exceptions are Russia, which is ranked significantly lower on an ultimate-risk basis and indeed falls out of the ten largest risk exposures, and South Korea, which moves up to fifth from ninth.

In summary, there are many caveats that indicate that the rankings should be used as broad indicators rather than as definitive assessments.

To give some feel for the sensitivity of the results to the assumptions, the next section explores the sensitivity of the rankings to two important assumptions.

### Sensitivity to caveats

#### (a) Third country effects

One rudimentary way of assessing the potential for third-country effects is to look at expected default losses for all banks in the BIS area<sup>16</sup>, rather than just UK-owned banks. This is also interesting in its own right as a measure of the on-balance-sheet credit risk exposures of industrialised country banking systems in aggregate.

Table 8 shows the results for the 15 highest-ranking *developed economies*. The United States remains the highest-ranked risk. Using total BIS area exposures increases the importance of Germany, Japan and Italy relative to other developed economies.

Chart 5 also compares risk-exposure rankings for the BIS-area banks with those of UK-owned banks. The strong correlation (of 0.78) is apparent, but the precise rankings vary slightly between the two measures.

**Table 8: Ranking of developed economies using BIS banks' external claims (ratings based), end-December 1999**

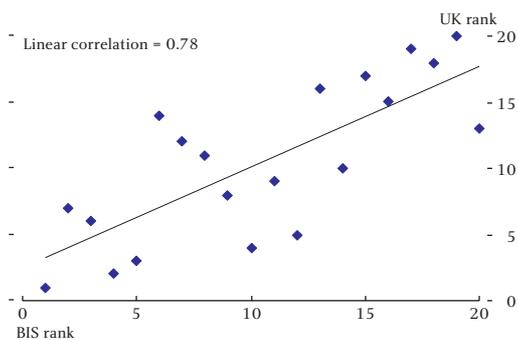
	Expected default loss (US\$billions pa)	Exposure (US\$billions)	Credit risk (per cent pa) <sup>(a)</sup>
1 United States	9.9	1,030	1.0
2 Germany	2.8	601	0.5
3 Japan	2.2	264	0.8
4 Netherlands	2.1	240	0.9
5 France	2.0	394	0.5
6 Italy	1.9	401	0.5
7 Belgium/ Luxembourg	1.7	386	0.5
8 Switzerland	1.1	304	0.4
9 Canada	0.8	137	0.6
10 Spain	0.7	136	0.5
11 Ireland	0.7	109	0.6
12 Australia	0.6	79	0.8
13 Sweden	0.6	89	0.7
14 Greece	0.4	54	0.8
15 Denmark	0.3	66	0.5

Sources: BIS and Moody's.

(a) Credit risk is, of course, different from the figures used in Table 4. This follows because the sectoral distribution of BIS-area bank exposures to each country may differ from the pattern of UK-owned banks' exposures.

**Chart 5:**

**Rankings for developed countries using BIS-area and UK-owned banks' external claims (ratings-based), end-December 1999**



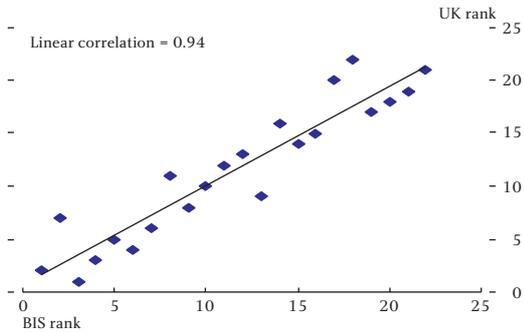
Sources: Moody's, BIS and Bank of England.

Turning to the *EMEs*, rankings of expected default losses for all BIS-area banks are more similar to those for UK-owned banks than was the case with the developed economy exposures (Chart 6). The notable exception is Russia, which ranks first under the BIS-area measure and seventh for UK-owned banks.

<sup>15</sup>: Defined as lying within the country where the guarantor of a financial claim resides or where the head office of a legally dependent branch is located.

<sup>16</sup>: The BIS data cover all banks with head offices in the BIS area plus any other branches and subsidiaries in the BIS area.

**Chart 6:**  
**Rankings of EMEs using BIS-area and UK-owned banks' external claims (ratings-based), end-December 1999**



Sources: Moody's, BIS and Bank of England.

The difference is due mainly to the large claims of German banks on Russia.

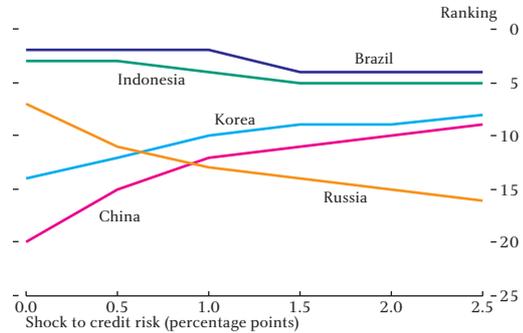
**(b) Level of credit risk**

A number of the caveats relate to the estimates of credit risk, and in particular the absolute level of credit risk associated with a given spread or rating. Our interest in this article is in a ranking rather than an absolute estimate of expected default losses, but even the ranking may be affected by errors in evaluating the level of credit risk<sup>17</sup>.

As a thought experiment, raising the annual credit risk of all EMEs by as little as 0.5pp has a significant effect on some rankings within the top ten EMEs. The effect becomes gradually less significant as the shock to credit risk is increased beyond 1pp. Chart 7 shows how the ranking of several EMEs changes as credit risk is assumed to increase above that implied by the rating. It is notable, however, that the rankings of some EMEs are not changed much (eg Brazil and Indonesia).

A similar experiment of raising credit risk by 0.5pp for the developed countries is unrealistic, as it implies more than a doubling of credit risk for banks and public agencies. But in fact, it would not change the ordering radically. Altering the credit rating assumed for corporate exposures – where the method makes the most assumptions – does not necessarily affect the rankings materially. For example, using a Baa2 corporate rating in place of the Ba2 assigned to all corporates leaves the rankings broadly unchanged (the correlation between the rankings of the

**Chart 7:**  
**Effects of increasing credit risk on EME rankings**



Sources: Moody's and Bank calculations.

20 largest countries is 0.94). Japan is a notable exception, ranking second when a Baa2 rating is used for the corporate sector risk and fifth under Ba2.

The effects are potentially greater for the OFCs where (as discussed above) exposures are large and the sovereign rating is a particularly poor proxy for (imperfectly understood) credit risk.

**Conclusions**

There are many ways in which shocks to financial stability abroad can affect the United Kingdom and data on the totality of the UK foreign exposures is incomplete. Moreover, there is no widely accepted model of financial stability. For that reason, there is some merit in developing a systematic 'baseline' ranking of economies in terms of their importance to the UK financial sector.

This article has presented one possible approach, which addresses both the magnitude of the overseas exposure and related credit risk – a measure of the 'expected default loss' faced by UK-owned banks on their on-balance-sheet exposures.

The rankings derived underline the importance of EMEs as well as developed economies to UK financial stability. However, rankings within a particular class of economies – eg the EMEs or developed economies – are likely to be more robust than global rankings that seek to compare them. Monitoring rankings over time may help us to track the combined effects of significant changes in the UK exposure to, and the credit risk from, particular economies.

This approach suggests a number of avenues for further work. For example, it would be possible to

<sup>17</sup>: The expected default loss calculation is multiplicative.

refine the credit ratings applied to the developed country corporate sectors. Including a wider range of sectoral ratings in EMEs might also be worthwhile. More ambitious extensions would be to embody the extent of UK non-bank financial institutions' overseas exposures; banks' off-balance sheet credit exposures; and the extent to which banks have set aside provisions or capital against expected losses – an issue discussed in the accompanying article on *Fair Value Accounting*. Finally, the nature and scale of risks posed by OFCs also warrant further study.

### ANNEX: The relationship between bond-yield spreads and credit risk

This Annex derives a simple analytical expression for the relationship between the bond-yield spread and credit risk. It is a one period model of a zero-coupon bond, which defaults with a probability  $\beta$  and so pays its par value  $B$  with probability  $(1 - \beta)$ . In the event of default, there is some recovery at rate  $\rho$ , giving an expected default loss of  $\beta(1 - \rho)B$ . The investor is assumed to be risk neutral. Incorporating liquidity and risk premia would reduce the inferred probability of default loss, which is therefore biased upwards by this methodology.

The method is to derive the initial price of the bond,  $S$ , in terms of the risk-free interest rate, default probability and recovery rate. By using the relationship between price and yield to maturity for a one-period bond, we then obtain an expression for the yield spread in terms of the above parameters.

#### Price determination

The expected return on the risky bond is given by:

$$E(\text{gross return of risky bond}) = \beta\rho B + (1 - \beta)B$$

For a risk-neutral investor, the return on holding a risk-free asset yielding a risk-free rate of interest,  $r$ , and that on holding a risky bond must be equal. That means that:

$$\begin{aligned} S(1 + r) &= (\beta\rho + (1 - \beta))B \\ &= (1 - \beta(1 - \rho))B \end{aligned}$$

For zero recovery, the price is simply the probability that the bond does not default multiplied by the discounted par value. For a non-zero rate of recovery, the price is determined by the probability of default loss, which is the product of the default probability

and the non-recovered portion in the event of default.

#### Yield spreads

It is straightforward to turn this expression for price into one for the risky bond yield. By definition, the yield to maturity,  $y$ , on the one-period bond is determined by the relationship:

$$S = \text{present value} = \frac{B}{(1 + y)}$$

Putting these two equations for price together, some simple algebra gives us the following equation for the bond-yield spread:

$$\text{Spread} = (y - r) = \frac{\beta(1 - \rho)(1 + r)}{(1 - \beta(1 - \rho))}$$

Under these assumptions, the spread is a linear function of the risk-free interest rate and a non-linear function of the expected default loss,  $\beta(1 - \rho)$ . Market perceptions of risk therefore implicitly contain both an expected probability of default and an expected recovery rate in the event of default. Within this one period framework, however, it is impossible to identify the contribution to the yield spread made by each since they enter the equation in precisely the same way. The yield is quoted in annual terms, so the probability of default loss is the annual rate of default loss.

An alternative, but equivalent expression for the degree of credit risk in terms of the spread and gross yield of the risky bond is:

$$\beta(1 - \rho) = \frac{\text{spread}}{\text{gross yield}} = \frac{(y - r)}{(1 + y)}$$

# Fair value accounting, capital standards, expected loss provisioning, and financial stability

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A very important issue for the banking industry at present is whether fair value accounting should be adopted, as is being proposed by a number of accounting bodies. During the 1990s, banks' accounts moved from being based entirely on historical cost to a mixed historical cost / market value approach, reflecting developments in banks' business. This article discusses whether the mixed model is sustainable and the pros and cons of full fair value accounting. It examines, in particular, the increased use of portfolio hedging and systems to differentiate between loans according to expected loss; and looks at the read across between the accounting treatment of loan books and moves by regulators to use banks' own risk assessments in capital adequacy requirements. There are potential advantages in full fair value information from banks or, at a minimum, the adoption of better provisioning methods against expected losses in loan books. The latter should be achievable now, and could usefully be debated by the industry and regulators, perhaps under the Basel umbrella. But full fair value accounting would be more complex and, given a number of difficult measurement issues, fair value disclosure may be a sensible first step before considering any change to the statutory accounts. That would enable banks, investors, creditors, accounting standard setters, and the authorities to learn from experience.

**INTERNATIONAL AND NATIONAL** accounting standard-setting bodies are considering whether to recommend that company accounts should show all financial instruments on a fair value basis<sup>1</sup>, rather than use the current mixed model under which instruments held for trading are shown at market value while those held for the longer term are shown at historical cost. This has particular implications for financial firms, for whom financial instruments comprise the majority of assets and liabilities. The Bank of England has an interest in the debate, particularly as it affects the banking industry, because of the importance of disclosure for financial stability and efficiency, and because accounting standards can affect bank behaviour.

Proposals for the introduction of full fair value accounting are being prepared by the International Joint Working Group of Accounting Standard Setters on Accounting for Financial Instruments (JWG)<sup>2</sup>. The JWG was set up in 1997 by the G4+1<sup>3</sup> and asked to develop proposals for a comprehensive and internationally harmonised accounting standard for the recognition and fair value measurement of financial assets and liabilities. The premise of the JWG is that all financial instruments<sup>4</sup> should be measured at fair value for all financial institutions and that all gains and losses arising from changes in fair values should be recognised immediately in the profit and loss account. The JWG expects to finalise

**1:** Each financial instrument would be shown at fair value - 'an estimate of the price an entity would have realised if it had sold an asset or paid if it had been relieved of a liability on the reporting date in an arm's-length exchange motivated by normal business considerations. That is, it is an estimate of an exit price determined by market interactions' - FASB (1999).

**2:** The JWG comprises people nominated by the accounting standard setters from Australia, Canada, France, Germany, Japan, New Zealand, the Nordic Federation, the United States, the United Kingdom and the International Accounting Standards Committee (IASC).

**3:** A group of representatives of national accounting standard setting bodies set up initially by Australia, Canada, the United Kingdom and the United States and subsequently joined by New Zealand.

**4:** The IASC definition of a financial instrument in International Accounting Standard (IAS) 32 is 'any contract that gives rise to both a financial asset of one enterprise and a financial liability or equity instrument of another enterprise'. The UK Accounting Standards Board (ASB) follows this definition in Financial Reporting Standard (FRS) 13. Financial instruments include both primary financial instruments - such as bonds, debtors, creditors and shares - and derivative financial instruments, ie this includes loans and funding. See IASC (1995) and ASB (1998).

its proposals by October 2000. They will then be issued for comment by each of the participating standard setters.

This article looks at the background to the current debate. It discusses the pros and cons of historical cost accounting and of fair value accounting for bank balance sheets, examines some issues in the measurement of fair values, and then considers the relationship between accounting standards and regulatory capital. Important issues are the extent to which accounting practices and public disclosure are consistent with risk management approaches within the banks and the approaches used by the regulators; and how the information in banks' accounts can be suited to the needs of depositors as well as shareholders.

## Background

The mixed accounting approach was developed over the 1990s in response to the changing use of financial instruments and also the creation of new instruments for which historical cost accounting was ill-suited. While securities traders traditionally showed their trading book assets and liabilities at market value, banks did not. As the banks started to trade securities positions more actively, a historical cost treatment became less appropriate for these positions. In addition, the development of derivatives and swaps raised questions about accounting treatment. These contracts initially involve no, or only a small, exchange of value and were invisible on the balance sheet; even after accounting changes, many remain invisible<sup>5</sup>. Notwithstanding market developments, most bank assets and liabilities are still likely to be held to maturity<sup>6</sup> and are valued in accounts on a historical cost basis – in particular loans and funding are shown on this basis. The current debate focuses on whether all financial instruments should be shown on a fair value basis, regardless of whether or not they are likely to be held to maturity.

Originally, historical cost accounting developed not as a means of portraying economic value but as a system for monitoring property and resources entering and exiting firms in order to prevent misuse and theft<sup>7</sup>. For such purposes the accuracy and verifiability of underlying data were paramount concerns, and the original purchase prices sufficed. For banks, too, with business activity that could be represented by simple on-balance sheet receivables and payables, the approximation provided by historical costs seemed acceptable.

By the late 1980s, however, there was widespread recognition among bank regulators and accounting standard setters that traditional accounting approaches were obscuring the real value of securities and derivatives and swaps. Regulators responded by introducing, in 1988, a capital adequacy methodology designed to capture the credit risk from off-balance sheet instruments<sup>8</sup>. Accounting standard setters also started to review the treatment of financial instruments including off-balance sheet items. In 1989, the International Accounting Standards Committee (IASC)<sup>9</sup> began a long-term project to develop a comprehensive standard on recognition, measurement and disclosure of financial instruments<sup>10</sup>.

The Annex sets out the steps since taken by standard setters towards fair value treatment of different financial instruments. For securities held for trading, the standards largely codified best market practice at the time. The focus for derivatives was initially on disclosure of fair values rather than the incorporation of fair values in the accounts.

The United States went much further than other countries with regard to fair value disclosure. From 1992, with Statement of Financial Accounting Standard (SFAS) 107, the Financial Accounting Standards Board (FASB) required disclosure of fair

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<sup>5</sup>: For UK banks the Statement of Recommended Practice (SORP) on Derivatives – issued by the British Bankers' Association (BBA) and the Irish Bankers' Federation (IBF) – requires derivatives held for trading purposes to be measured at fair value, but those classified as non-trading transactions to be measured on an accruals basis equivalent to the underlying asset, liability, position or cash flow. Therefore many remain at historical cost and are invisible on the balance sheet. BBA (1996).

<sup>6</sup>: There are now many types of bank asset that can, in principle, be sold. However outside the United States there is no ready market for most of them. Growing use of securitisation by banks does, however, mean that hold-to-maturity can no longer realistically be assumed for loan books.

<sup>7</sup>: Benston (1989).

<sup>8</sup>: Basel Committee on Banking Supervision (1988).

<sup>9</sup>: The IASC is an independent, private sector body, formed in 1973 with the objective of harmonising the accounting principles which are used by businesses and other organisations for financial reporting around the world.

<sup>10</sup>: IASC (1997).

values of all financial instruments in the notes to financial statements<sup>11</sup>. This included fair value estimates for banks' loan portfolios, deposits<sup>12</sup>, other borrowings, and off-balance sheet financial instruments such as interest rate swaps, commitments, and derivative contracts.

The adoption of this standard was controversial. US banks resisted strongly, arguing that 'it would be very difficult to set a fair value for many commercial and industrial loans, which are often unique in value and lending terms'<sup>13</sup>. There was also disagreement over SFAS 115, which required the inclusion of fair values for some securities in the primary financial statements<sup>14</sup>. The Securities and Exchange Commission (SEC) and FASB argued that the standard would improve the accuracy of reported net worth, while bankers and bank regulators argued that it would induce spurious volatility since the standard applied fair values to only some financial assets and to no liabilities on the balance sheet<sup>15</sup>.

In the late 1990s, standard setters moved towards requiring more financial instruments to be included in the accounts at fair value. In June 1998, in the United States, SFAS 133 'Accounting for Derivative Instruments and Hedging Activities' was issued. The IASC adopted a similar approach with International Accounting Standard (IAS) 39 (to be effective from January 2001, although it will not be implemented in all member countries). These standards establish comprehensive fair value accounting requirements for all derivatives and those debt and equity securities held for trading or available for sale. Loans and

deposits, securities intended to be held to maturity and unquoted equity instruments are required to be recorded at book value.

Both FASB and IASC see this mixed historical cost/market value model as an interim arrangement. The proposal to move to full fair value accounting has been under discussion for some time. For example, in 1996 the UK Accounting Standards Board (ASB)<sup>16</sup> issued a discussion paper 'Derivatives and other Financial Instruments' which concluded that mixed models were unsatisfactory and that all financial instruments should be measured at fair value. The following year a joint IASC/CICA (Canadian Institute of Chartered Accountants) reached the same conclusion in its discussion paper 'Accounting for Financial Assets and Financial Liabilities'<sup>17</sup>. Discussion of this paper convinced standard setters that further work was necessary. The JWG was therefore established to develop proposals for a comprehensive standard on fair value accounting for financial assets and liabilities.

In August 1999, the JWG wrote to the Joint Working Group of Banking Associations (JWGBA<sup>18</sup>) on Financial Instruments explaining why it favoured fair valuation of financial instruments for banks. In October 1999, the JWGBA responded to the JWG, setting out the banking community's position and defending the current mixed model as the most appropriate basis for communicating financial information to users of bank accounts. The group criticised fair value on grounds of relevance and reliability and argued that the mixed measurement

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**11:** The Statement requires fair value disclosure 'where practicable', ie where an estimate of fair value can be made without incurring excessive costs. If estimating fair value is not practicable, this statement requires disclosure of descriptive information pertinent to estimating the value of a financial instrument. Fair value disclosures are not required for the following: pensions and other post retirement benefits, employee stock options and stock purchase plans, substantively extinguished debt, lease contracts, investments accounted for under the equity method, and minority and equity investments in consolidated subsidiaries.

**12:** SFAS 107 specifies that the fair value of deposit liabilities with no defined maturity (eg demand or current account deposits) is to be measured at the amount payable on demand at the reporting date – invariably the book value.

**13:** Eccher, Ramesh and Thiagarajan (1996), quoting the manager of accounting policy for the American Bankers' Association.

**14:** Securities are fair valued if they are classified as held for trading, or 'available for sale'. Those held as investments ('held to-maturity securities') remain at historical cost. FASB (1993).

**15:** Beatty, Chamberlain and Magliolo (1996).

**16:** The ASB is a subsidiary of the Financial Reporting Council (FRC), established by the UK Government in 1990. The chairman and the three deputy chairmen of the FRC are appointed by the Secretary of State for Trade and Industry and the Governor of the Bank of England acting jointly. The ASB's role is to issue accounting standards, recognised under the Companies Act 1985 (amended by the Companies Act 1989), which requires directors to report to shareholders on the financial performance and position of the company. Accounting standards apply to all companies, and other kinds of entities that prepare accounts that are intended to provide a true and fair view.

**17:** IASC (1997).

**18:** The Joint Working Group of Banking Associations on Financial Instruments comprises representatives of the banking associations of the United States, Australia, Canada, Japan, and the European Union. The European Union is represented collectively by the Federation Bancaire and individually by the British, Dutch, French and German associations.

system 'is well understood and allows for comparison between entities'<sup>19</sup>.

### Advantages and disadvantages of the two methods

This section examines the relative merits of, on the one hand, retaining the current mixed approach and, on the other, moving to full fair value accounting. Fair value accounting would mean that financial assets and liabilities were no longer distinguished on the basis of a bank's intended holding period. Almost the whole balance sheet would be shown on an economic value basis. But this section first considers whether the current mixed approach is in any case likely to remain viable.

### Is the current mixed model sustainable?

If banks managed their banking books completely separately from their trading books, the mixed model would probably be sustainable. But such a separation often – and increasingly – does not reflect the way banks manage their books. Trading book instruments are, for example, used to hedge the interest rate risk in the banking book. Over time greater use will probably also be made of credit derivatives to hedge credit risk in the banking book.

This creates difficulties for the mixed accounting model<sup>20</sup>. A trading book position hedging a book value instrument has to be shown at book value. To show it at market value could create the illusion of losses or profits whereas in fact they simply offset gains or losses in the value of the hedged asset (or liability). Where a bank is hedging instrument by instrument, individual matched positions can be identified reasonably straightforwardly. But banks hedge across broad areas of risk rather than instrument by instrument, which opens up the danger that, without clear guidance on what hedges will be allowable and detailed record keeping, there could be ex post cherry picking. Specifically, losses on market value instruments could be disguised by designating them ex post to be hedges against book value positions, even though on a full fair value basis there might be a net overall loss.

An example of hedging strategies that do not fit easily into the mixed accounting approach are the techniques used to manage interest rate risk across a bank's activities as a whole. Different parts of a bank may use internal transactions (such as swaps with different divisions in the same bank as counterparties) to transfer interest rate risk to a central treasury function. The treasury then aggregates the risks, taking account of offsets, and selects an appropriate hedge for the net exposure in each time band.

Accounting standard setters have not found it easy to frame rules for the treatment of these macro hedges which avoid the risk of cherry picking. In consequence, IAS 39 recognises such hedges only if certain additional conditions are met. Banks will need to replicate the effects of hedging consolidated net positions by associating the hedge with a specific asset or liability that gives rise to the same exposure. It also states that hedge accounting at the bank level cannot be achieved by using internal transactions 'unless the risk is ultimately offset with an external party'<sup>21</sup>. Banks are concerned that this may lead to inflexibility in hedging processes and to expensive systems and documentation to designate and assess the effectiveness of hedges<sup>22</sup>.

These examples illustrate the strains which have already emerged because accounting practice no longer matches current risk management practice. To the extent that banks come to view their exposures on a whole bank basis, so the difficulties caused by the mixed model are likely to become more pronounced.

### Historical cost accounting for the banking book

The advantages of historical cost accounting, at least for items without a readily available market price (such as loans and funding), are that the figures should be unambiguous and that the method is reasonably easy to apply. Many banks also feel that, combined with appropriate provisioning policies, historical cost accounting fits with their hold-to-maturity approach to these items – although the hold-to-maturity approach to loans seems to be slowly changing.

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19: Joint Working Group of Banking Associations on Financial Instruments (1999).

20: Carey (1995), looking at the effect of the introduction of market valuation for securities in bank accounts, shows that partial fair value approaches of this kind can make measured capital less accurate because hedges with the banking book are ignored.

21: IASC (2000). See also IASC (1998).

22: Basel Committee on Banking Supervision (2000) highlights some of the concerns about the effects of IAS 39 on risk management.

## Box 1: Savings & Loans crisis

Between 1980 and 1994, 1,295 Savings and Loans (S&Ls) institutions, with assets of US\$621 billion, closed down or received Federal Savings and Loans Insurance Corporation (FSLIC) assistance (Federal Deposit Insurance Corporation (1998)). The S&Ls had been weakened by a sharp increase in their funding rates and poor investment decisions, but accounting treatment also played a part. Under historical cost accounting the S&Ls still appeared to be solvent despite a deficit on a market value basis of US\$118 billion. The SEC believes that this provided scope for regulatory forbearance (Beatty (1995a)).

S&Ls were initially mutual associations that financed fixed-rate mortgages on homes with long-term fixed-rate deposits. Federal law capped the rate of interest that could be paid on bank and S&L deposits. However, in the face of competition from money-market mutual funds they were permitted by Congress to take short-term deposits at market interest rates. Following this change, S&Ls were exposed to substantial interest rate risk, as 80 per cent of their lending was in fixed-rate mortgages. These were repriced at much lengthier intervals than their deposits (Brumbaugh and Carron (1987)).

Problems for the S&Ls began in 1979 when interest rates increased sharply. From 1978 to 1982, the average cost of S&L funding rose from 7 to 11 per cent, exceeding the average return on their mortgage lending – Breedon (1990). However, the embedded interest rate losses (under historical cost accounting) showed up only in earnings each year going forward, whereas on a fair value basis they would have shown up in the calculation of net worth through the present value calculations. On a historical cost basis the S&Ls sustained a sharp fall in earnings but still appeared to have positive net worth. In 1981 and 1982, S&Ls made losses equivalent to 22-23 per cent of equity capital compared with the previous decade's returns of 10-15 per cent (Starbuck and Pant (1996)).

In response to the crisis, the regulators (FSLIC) rather than forcing the liquidation of unhealthy firms, decided to exercise regulatory forbearance – in effect gambling that the interest rate increases would be reversed. Forbearance included a loosening of

accounting standards. S&Ls were permitted to re-value property and premises upward - without recognising the decrease in the values of other assets. In addition they were allowed to amortise goodwill from acquisitions of other S&Ls over 40 years, while immediately recognising the income from the acquired assets. This enhanced their apparent profitability and their capital - by 1983 this 'goodwill' amounted to 90 per cent of S&Ls' reported equity capital (Starbuck and Pant (1996)). The FSLIC also persuaded Congress to reduce the regulatory requirements for minimum book net worth between 1980 and 1982. Even more damaging, they allowed S&Ls to calculate this as a 5-year rolling average.

Regulatory forbearance created an opportunity for firms to gamble for resurrection. Deregulation and lower net worth requirements meant they could take on riskier investments. In 1982, Congress enacted legislation to permit S&Ls to diversify their asset portfolios – allowing investment in non-residential real estate and consumer loans to reduce dependence on mortgage lending. Many invested in 'junk' bonds and real estate deals with extremely high risks. The upfront fees and initial interest income enabled them to disguise the income shortfall in their lending book, exacerbating the problems in the long run. A dip in the real estate market added loan losses to the embedded interest rate losses facing the industry. In the south, real estate fell by more than a fifth in the five years after 1984 – White (1991b). To compound matters, S&Ls were allowed to defer losses on loans sold over the remaining contractual life of the asset rather than recognising the loss immediately. The accounts therefore failed to highlight the massive losses embedded in many S&L books.

The crisis led to calls in the United States for a move to fair value accounting. Regulatory Accounting Practice (RAP) which covered the S&Ls had been more lenient than US GAAP (Generally Accepted Accounting Principles) - but GAAP had also given over-optimistic estimates of the solvency of the industry. Brumbaugh and Carron (1987) estimated that in 1982 RAP had shown S&L industry-wide net worth was 3.7 per cent of assets and that under GAAP their net worth was 3.0 per cent. The estimated net worth on a market value was -12.0 per cent.

However, although historical cost accounting might appear to give a reasonable valuation of a loan book or funding (given that at maturity the bank is due to receive the original amount of the loan and would have to repay the original amount of its funding), in practice the position is more complicated.

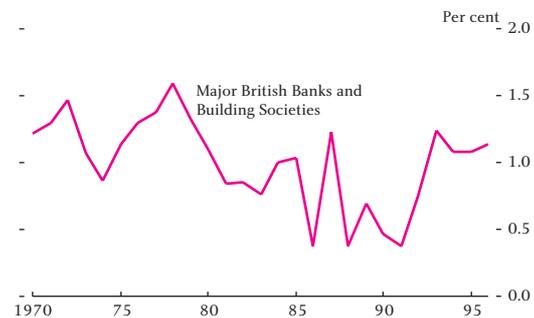
The economic value of a bank's portfolio of loans and funding can change day by day as interest rates change and as the credit quality of its borrowers changes. For example, if a bank makes long-term fixed-rate loans and funds itself using floating-rate deposits, without hedging the interest rate exposure, an increase in interest rates would reduce its net interest income in the current and future years, and therefore its economic worth. Embedded interest rate losses of this kind are at present neither reflected directly in historical cost accounts nor in provisioning. The impact tends to show up only gradually in the form of lower future income (or losses). Where both funding and loans are at floating rates, exposures to the general level of interest rates are smaller and the risk of embedded losses is reduced.

In a similar way, a deterioration in the average quality of a bank's loan portfolio is not reflected in historical cost accounts until the loans are actually impaired and provisions are made against them. When a bank makes a loan, the margin over the funding rate should in principle be set at a level to cover a bank's expected losses on that type of loan, remunerate the bank for the capital it must set aside to cover unexpected losses, and cover various risk premia. To the extent that the margin is set to cover the expected loss, the book value and fair value at the outset should be the same. If the credit quality of the borrower turns out worse than anticipated, ie the expected loss increases, fair value would be lower than book value. Any such deterioration would not be recognised in historical cost accounts.

Also, under historical cost accounting, the margin set to cover the expected loss is treated as profit until problems actually occur with specific loans. Under the UK Statement of Recommended Practice on Advances, specific provisions can only be made in respect of identified impaired loans. General provisions can only be made in respect of loans which have not yet been specifically identified as impaired,

but which are known from experience to be likely to be present. Under this treatment, strictly interpreted, provisioning policy cannot be forward looking because even the general provision only relates 'to impairment already existing in the advances portfolio at the balance sheet date. It does not relate to advances which at the balance sheet date are subject to no more than normal credit risk, but which in the nature of things may become impaired in the future'<sup>23</sup>. The tax treatment in a number of countries, where provisions cannot be deducted from taxable income unless they cover already-impaired loans, may also discourage banks from setting aside such provisions.

**Chart 1:**  
**Ratio of pre-tax profits to total assets**



Sources: British Bankers' Association and Building Societies Commission.

Given the cyclical nature of credit losses, a lack of expected loss provisions can create the potential for substantial swings in the measured profitability of banks. It has probably contributed to the volatility of UK bank earnings – see Chart 1. This is not to argue that the kind of 'hidden reserves' used in the past, should be reintroduced to smooth earnings but that provisions could transparently recognise that a large part of the margin is to cover the loss expected by a bank when loans are made and that there can be subsequent changes in expected loss.

There are several examples of crises that have probably been exacerbated by lack of market access to information on embedded losses. For example, in the US Savings & Loans crisis, despite interest rate increases and poor investment decisions, the published historical cost accounts persisted in showing S&Ls to be solvent, while on a market value basis they apparently had a deficiency of over US\$100 billion (see Box 1). This misleading information probably reduced market pressure for

23: BBA (1997).

## Box 2: Japanese banks' provisions

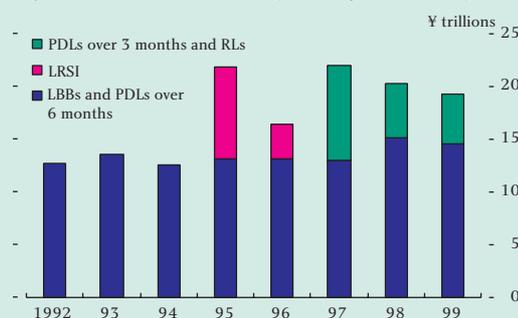
Japanese banks disclose their non-performing loans under standards set by the Japanese Bankers' Association (Zenginkyo). The definition of non-performing loans used by Zenginkyo, prior to Financial Year (FY) 1995, was narrow, comprising loans to borrowers in legal bankruptcy plus loans in arrears for six months or more. The definition of non-performing loans was broadened from FY1995 to include restructured loans but only those where the interest rate has been reduced to below the Bank of Japan discount rate. In FY1997, the definition was again widened to include loans in arrears for more than three months and all restructured loans. However, the Zenginkyo definition does not include loans where, even though no payment problem has yet arisen, the bank has serious doubts about the ability of a borrower to fulfil its future obligations.

From FY 1998, the Japanese Financial Supervisory Agency (JFSA) introduced a more comprehensive assessment of problem loans in parallel with the existing accounting standards. Assets have to be classified according to their collectability:

- Category I: Assets with no problems in terms of collectability;
- Category II: Assets with higher collectability risk than normal because of difficulties in fulfilling contracted conditions, or due to concerns about the credit risk of the borrower;
- Category III: Assets with concerns over final collection or value. Losses are likely to be incurred, but it is difficult to make estimates of the timing and scale of the losses;
- Category IV: Assets that are assessed as uncollectable or of no value.

At the end of September 1999 the major banks had ¥37.7 trillion in category II assets, ¥1.9 trillion in category III assets but no category IV assets because they are written off at the end of the financial year. The value of category II-IV assets is often treated by the press as if it is the true measure of non-performing loans. However, not all category II and III assets will become non-performing. The JFSA recommend 70 per cent provisions for category III assets but 15 per cent provisions for category II assets.

**Chart A:**  
Major banks outstanding non-performing loans<sup>(a)(b)</sup>



Source: Japanese Financial Supervisory Agency.

(a) Financial year-end except 1999, which is end-September.

(b) Hokkaido Takushoku Bank excluded from 1997 and Long-term Credit Bank and Nippon Credit Bank excluded from 1998.

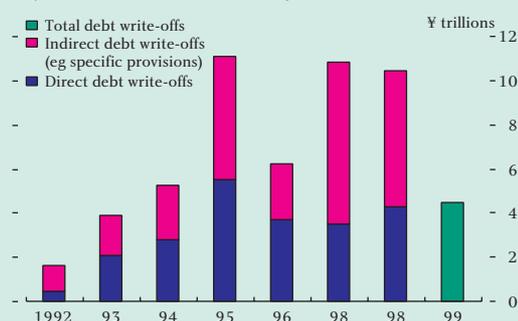
Note: PDL- Past due loans; LRSI- Loans with reduced or suspended interest; RL- Restructured loans; LBB- Legally bankrupt borrowers.

Chart A sets out the problem exposures of the major Japanese banks under the different measures. With each redefinition of problem exposures the amount of non-performing loans, as disclosed by the banks, substantially increased. This is despite the fact that these non-performing loans are net of write-offs which were also increasing over this period.

It is possible that the crisis was prolonged by delaying provisioning and write-offs. Specific provisions and write-offs in the first three years of the Japanese downturn, 1992 to 1994, amounted to only ¥11 trillion compared with ¥54 trillion over the whole period 1992 to 1999 (see Chart B). It is noticeable that in 1995, when the redefinition of non-performing loans led to a sharp increase in the disclosed amount, specific provisions and write-offs also increased substantially.

Fair value accounting regimes (with full allowance for expected loss) should mean that problems would tend to become evident earlier.

**Chart B:**  
Major banks' loss on disposal of bad debts



Source: Japanese Financial Supervisory Agency.

action. Historical cost accounting may also have weakened market discipline in the more recent Japanese financial crisis where, following sharp falls in property and equity markets, provisioning took a number of years to reflect the extent of the latent damage to loan books (see Box 2).

### **Fair value accounting**

Fair value accounting has been advocated by some as the best way to ensure that embedded losses are fully recognised in accounts.

In principle, an alternative would be provisioning. Banks could carry expected loss provisions for their credit books which recognised any shortfall in margins below current estimates of expected losses. In the same way, it would be possible for provisions to cover any embedded losses caused by changes in interest rates. An industry-regulator debate, under the Basel umbrella on sound practices for expected loss provisions could usefully follow completion of the current work on the new Capital Accord.

It would, however, be complicated to try to mirror a full fair value approach and any attempts to do so would raise many of the same issues/concerns as full fair value accounting. These concerns are explored below.

#### *(a) Potential administrative costs*

Fair value accounting would impose some costs on banks through the need to estimate and verify fair values. The only items for which there are ready fair values are instruments for which the market price can be used because they have deep and liquid markets. For a large part of banks' books (assets and liabilities) fair values would have to be estimated. For example, loans, which account for about 60 per cent of the on-balance sheet assets of major British banks<sup>24</sup>, are not actively traded.

The additional costs imposed would, however, be lower if the banks could rely on internal systems already in place for other purposes – most obviously those used for the purposes of the new Capital Accord. But even relying on existing systems, there would be questions of market consistency. Standards would probably have to be established for determining fair values for non-marketable assets so

that accounts were comparable across institutions and across time.

#### *(b) Volatility in net worth*

A number of concerns about fair value are related to the possible volatility of fair values. Fair value accounts could be excessively influenced by current market conditions which might prove temporary, although future changes in market conditions may as soon reinforce as offset previous changes. Movements in interest rates (and so in the discount rate used in present value calculations) would, for example, generate volatility in the value of assets and liabilities and therefore in measured capital and earnings. This could in addition affect financial covenants (by leading to unexpected breaches) although this may well be more of an issue for non-banks; banks are not usually covered by covenants in their own dealings.

Any effects of this kind would depend on the extent of the added volatility. Much would, of course, rest on the extent to which a bank was hedging its interest rate risk. Whether fair value would lead to more volatile net worth (and potentially earnings – see below) would also depend on the impact of the treatment of loans. Recognition of the fact that a large part of the margin on loans is a cover for expected credit losses rather than profit could, on the face of it, actually reduce volatility in earnings.

Another question is how any increased volatility would be interpreted by the market and whether it could lead to added volatility in banks' share prices. The available evidence on this (which is from the United States and relates to the accounting treatment of investment securities rather than loans) does not indicate that share price volatility would increase (see Box 3). It seems that investors already try to look through historical cost accounts to assess fair value (since that is relevant to the share price) but, with the information available, find it difficult to make more than a rough and ready assessment. US studies indicate that fair value disclosures in the United States do provide some extra information to shareholders.

#### *(c) Earnings and taxation*

Nonetheless, the treatment of earnings in fair value accounts does need to be carefully considered. The

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<sup>24</sup>: Source: British Bankers' Association (1999), 'Banking Business an Abstract of Banking Statistics'. The figure for end-1998 is 56.5 per cent, (Major British Banking Groups' aggregate balance sheet: total advances (sterling and foreign currencies) as a percentage of total assets).

### Box 3: US evidence on the effect of fair value disclosure and accounting practices

A number of studies have looked at whether fair valuation of investment securities conveys extra information to shareholders. US banks have been disclosing fair values of investment securities for many years and for this reason they have become a focus for the fair value debate. Barth (1994), Park, Park and Ro (1999) and Ahmed and Takeda (1995) all found that fair valuation of securities in held-to-maturity accounts did influence the share price, indicating that it did provide extra information to shareholders.

Other studies examined the information content of the different elements of fair value following more comprehensive disclosure of fair values for financial instruments in the United States. Under SFAS 107, the fair values of all financial instruments (both assets and liabilities) were disclosed in the notes to financial statements. Nelson (1996) looked at the incremental explanatory power for the share price of the difference between the fair value and book value of different elements of the accounts for 1992 and 1993. She found that the fair value of investment securities was reflected in market-to-book ratios but that fair values of loans, deposits, long-term debt and off-balance-sheet financial instruments provided no extra information.

However, other studies of the same period found different results. Eccher, Ramesh and Thiagarajan (1996) – using a larger sample of banks than Nelson – found that share prices were influenced by the fair values of investment securities and, for smaller banks, also by loan fair values. But overall, information on the fair value of individual financial instruments explained only a modest portion of the variation in market-to-book ratios. Traditional historical cost ratios were still important explanatory factors. In a study of the largest US banks, Barth, Beaver and Landsman (1996) concluded that fair values had much more influence on the share price than indicated by the earlier studies. They examined whether differences between market and book values of equity could be explained as a function of differences between the fair value estimates of particular financial instruments and their related

book values. They consistently found significant explanatory power for the fair value of loans; the fair value of long-term debt was also relevant.

These studies all covered the two years following the 1991 recession. This was a period when interest rates were falling, so that fair values generally exceeded book values. Eccher et al suggested that in a different period, when fair values were lower than book values – acting as an early signal of potential solvency problems – the explanatory power of the fair values might have been higher.

None of these studies found any information content in the fair values of bank deposits or off-balance sheet financial instruments. It was argued by Eccher et al that the lack of information from the fair values of bank deposits was possibly because demand deposits under SFAS 107 were valued at book value (no allowance is made for the behavioural maturity). The disclosure of off-balance sheet instruments under SFAS 107 was also unclear (eg the disclosures did not indicate whether the net position was an asset or a liability), making the fair values difficult to interpret. Using the more detailed derivative disclosures available after the introduction of SFAS 119 in 1994, Venkatachalam (1996) found that fair-value estimates for derivatives held for asset-liability management did influence bank share prices in 1993 and 1994. Although this disclosure was introduced in 1994, banks also included data for 1993 in that year's accounts.

Another focus of research has been the effect of fair valuation of certain investment securities (SFAS 115) on the volatility of earnings and capital. Barth, Landsman and Wahlen (1995) restated earnings and regulatory capital to reflect the fair valuation of banks' investment securities using disclosures of fair values in bank reports from 1971-90. They found that measured bank earnings, incorporating fair value estimates of gains and losses of investment securities, were indeed more volatile. In addition, if fair value accounting for investment securities had been used in the calculation of regulatory capital, banks would have been more likely to breach regulatory capital ratios than under historical cost accounting. However, the study found that volatility in fair value earnings did not lead to greater volatility in share prices.

JWG seem likely to propose that all changes in fair value should be recorded in the income statement – possibly with a differentiation of gains and losses based on financial risk characteristics (interest rate risk, credit risk etc). This approach is challenged by some who question whether all movements in fair values are profit/loss or at least whether they are all profit/loss in the current year. Certainly many investors use the earnings realised in the previous year as a guide to future earnings and may not be content with earnings shown only in terms of the change in fair value<sup>25</sup>.

This raises questions about the range of information that should be disclosed. Ideally any fair value approach would show not only the value of assets and liabilities and the resulting income, but also a breakdown of sources and changes in income caused by changes in inflation, interest rates, credit quality and other possible elements. Unrealised gains and losses would probably also need to be identified. There is much in this area which needs detailed debate.

A more practical and very important question concerns the tax treatment of earnings under fair value accounting. If the JWG definition of earnings were used for tax purposes, banks might be taxed on unrealised (and possibly unrealisable) gains. If the gains were related to say an increase in interest rates, which made the present value of their previously contracted liabilities fall, this might be difficult to realise. To pay the tax liability on unrealised gains, some assets might need to be sold.

#### *(d) Consistency with banking industry practices*

A key consideration is whether the fair value approach would bring accounts closer to the perception which banks themselves have of their worth. Traditionally banks regarded their loans in a rather binary way – loans either failed or they did not, and therefore the best estimate of value was historical cost, with specific provisions made when problems actually developed. This reflected an approach to risk management which did not seek to distinguish loans according to the expected losses at the time the loans were made. Risk management, certainly in the larger banks, now typically involves

internal loan grading systems which assess the default probability on different types of loan and then apply to this an estimate of expected loss-given-default to generate the expected loss. Loans, when made, are commonly allocated to a default frequency band and the loan is usually given an internal capital weight to reflect this. The credit quality is reassessed as time goes on and the loan is moved between bands to reflect the current assessment of risk.

The Basel Committee on Banking Supervision is now proposing to allow banks to base their credit risk capital requirements on their own internal gradings, derived in turn from their assessment of default probability (see below)<sup>26</sup>. Bank financial accounts which recognised the different credit risk in different parts of the book, as in fair value accounting, would seem to be closer to modern risk management practice. There would also be considerable advantages in terms of transparency and consistency in aligning the accounting treatment with the regulatory treatment of the loan book.

As for liabilities, the larger banks have developed systems to monitor the behavioural maturity of deposits and the consequential sensitivity to interest rate changes. This too brings internal risk management closer to a fair value approach.

Although fair value accounting probably accords better with current risk management practice than its historical cost counterpart, there remain many serious measurement issues. Some of the most important are explored below.

### **Measurement issues**

#### **Non-marketable assets**

The fair value of non-marketable assets such as loans needs to be estimated in a way which takes into account both the interest rate on the loan and the current assessment of the credit risk. The current value of a loan reflects the extent to which the contractual interest rate is higher or lower than the rate which can be obtained on similar new loans. It also reflects the credit worthiness of the borrower. The accepted approach to valuing non-marketable assets would be a present value calculation. But there

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<sup>25</sup>: Black (1980) and Treynor (1978).

<sup>26</sup>: Basel Committee on Banking Supervision (1999).

is less agreement on the discount rate which should be used. There are potentially three main options.

One option (option A) for loans to corporates would be to discount the contractual returns on loans using the current yield on corporate bonds with a similar rating. A difficulty with this is that many corporates are not rated - 27 per cent for the FTSE100<sup>27</sup> and for smaller corporates the proportion would be very much higher.

A more fundamental difficulty is that although bond yields reflect credit risk they also reflect a range of other factors which may be specific to the bond market. These factors (eg liquidity) will change as conditions in the market change or the preferences of bond market investors change. This problem is clearly illustrated by experience in autumn 1998. After the emerging market debt crisis developed, spreads on US corporate bonds widened sharply. For example, in the US market the spread between 5-year yields on BBB-rated corporate bonds and 5-year swap rates doubled from an average 57 basis points (April-June) to 114 basis points (September-November)<sup>28</sup>. Yields in the corporate loan market were more stable. Taking a sample of 43 new US dollar syndicated loans for US BBB-rated corporates for the period April to June and a sample of 47 similar loans for the period September to November, the average spread over LIBOR increased by only 7 basis points from 76 to 83 basis points<sup>29</sup>. Much of the increase in the spreads on corporate bonds is thought to have reflected concerns about market liquidity in the wake of the crisis. This was clearly a smaller factor in loan markets because loans are expected to be relatively illiquid investments.

In addition some loans have embedded options – for example, pre-payment options for mortgage customers – which are different from the embedded options in marketable bonds and would therefore not be captured in bond market spreads. This makes finding properly matching loan-bond pairs still more difficult.

Also, although a loan and a bond with the same rating in principle have the same probability of default, the

loss given default and therefore the expected loss (the mean default rate multiplied by the expected loss given default) could be different. This would again mean that bond market yields were not necessarily appropriate discount rates for loans.

Another approach (option B) would be to try to take into account explicitly the information on expected loss for individual loans, drawing on internal loan grading systems (where they exist). It would be possible to deduct the losses expected in each future year going forward on particular types of loan from the future cash flows on those loans before discounting. A view would have to be taken on the likely timing of the expected losses; one possible approach would be a flat rate in each year given difficulties in predicting economic cycles and their effects on corporate and household sector health. These expected cash flows would then have to be discounted using the current expected return (ie the current yield less the element to cover the expected loss) on similar types of loan. If those loans had similar call features then their costs would be taken into account in the expected return and therefore in the present value calculation. Otherwise a separate adjustment would have to be made for call features.

A third, and perhaps preferable, approach (option C) would be to discount the contracted payments on loans<sup>30</sup> using the current yields-at-issue on new loans of a similar type – for example, a 5-year-to-repayment AAA corporate loan would be discounted by the yield on a new 5-year AAA corporate loan (or an average of very recent loans of this type). In practice internal ratings based on default probability or expected loss would have to be used to match pairs of old and new loans rather than external ratings. This could ensure that the various loan market premia and the cost of embedded options were taken into account.

Discounting using a discount rate based on current yields on loans, as in options B and C, would be closer to an opportunity cost measure for a bank than discounting using bond market yields as in option A. For much of the book these assessments of current yield could possibly be carried out on a portfolio

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27: Source: Bloomberg (as at 13th June, 2000).

28: Source: Bloomberg (Merrill Lynch).

29: Source: Capital DATA Loanware.

30: ie not deducting the expected loss.

basis, rather than assessing each individual loan; homogeneous assets could be grouped together by, for example, expected loss, maturity and type of loan.

Both option B and option C have the advantage over option A that they could be used for any part of a banks' loan book, including retail loans and loans to small and medium sized enterprises. Option A could be used only for parts of the book where prices/yields were available on comparable bonds.

Both option B and option C would rely on the information within banks on expected losses (for option C to categorise loans) and yields on new loans of a similar type. The expected loss data would be subjective and there might be concerns about possible conflicts of interest on the part of the banks. It would also be important that the judgements about borrowers' creditworthiness which lie behind expected loss assessments took into account all available information, including likely robustness in a recession. There would need to be careful checks on the processes but the proposed use of internal ratings for regulatory capital requirements might also help to allay concerns. The Basel Committee has stated that for banks using internal ratings to calculate their capital requirements, the supervisory review process will play an important role in determining the reasonableness, accuracy, and comparability of internal rating systems across banking institutions<sup>31</sup>.

### Valuation of liabilities

Fair valuation of liabilities also raises a number of issues that need to be explored carefully.

#### (a) Maturity

A bank's liabilities include a number of items that have an uncertain maturity because the behavioural maturity is different from the contractual maturity. This is particularly the case with retail banks. How should this be handled?

Fair value should be calculated for a bank on a going concern rather than break-up basis. On a going concern basis it would be inconsistent to assume that a retail bank will repay all its current accounts at the

contractual maturity (which is today) because, if it did so, that would almost certainly cause its failure. The reality is that these accounts (on a portfolio basis) will have expected maturities spreading out into the future because the funds in the accounts will remain for much longer than a day and more importantly new funds will flow into existing accounts.

The banks model these liabilities as a portfolio for their interest risk measurement. The behavioural maturities estimated reflect the likelihood that new funds will flow into existing accounts which gives maturities for the portfolios of over a month. If these behavioural maturities were taken into account in the present value calculation, the value of these liabilities could well be less than their face value (reflecting their worth to the bank given their zero or low interest rates). However, the present value calculation would have to take into account the ongoing costs to the bank in maintaining the deposit base. A general point for all liabilities is that the original costs incurred in borrowing the funds would be included in the current year's costs and would not have to be taken into account in the present value calculation but future costs in maintaining the deposit would have to be included<sup>32</sup>.

The JWG is likely to recommend that the fair value of demand deposits should be the present value of the future expected cash flows. The standard setters acknowledge that internal models would have to be used to look at the behavioural maturity of a portfolio of deposits. However, the proposed calculation would focus on the maturity of individual demand deposits and would not assume that new funds are paid into existing accounts – although FASB is currently undecided on this issue<sup>33</sup>. Individual demand deposits decline over a monthly period (between salary payments) giving an average maturity of less than a month. This approach would give fair values for demand deposits which were not significantly different from the book value. If banks do see their low-interest current accounts delivering value, a fair value method that did not recognise this (because it assumed short behavioural maturities) could result in overall values for the banks that they did not recognise.

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31: Basel Committee on Banking Supervision (1999).

32: The same is not true for assets. For example, for loans discounted using the current yield on similar new loans, the discount rate would reflect the remuneration needed to cover ongoing costs entailed in managing the loan book and therefore a separate adjustment would not be necessary.

33: FASB (1999).

*(b) Discount rate*

Another range of issues relates to the discount rates that should be used in the present value calculation for liabilities.

Some parts of a bank's book are already valued on a present value basis. The standard approach to the valuation of a swap book, for example, is to discount the cash flows (from both sides of a swap) using the swap rate curves. Neither the credit risk of the counterparty nor that of the bank itself is taken into account. Models are being developed which take into account own-credit risk and the counterparty's credit risk<sup>34</sup>. Taking into account a bank's own credit risk for swap valuation could be seen as reflecting the cost of setting up an offsetting swap (to cancel the first) but would not be appropriate if a portfolio of swaps were being sold to another bank – in that case only the original counterparty's credit worthiness would be important. There are parallels for the treatment of other liabilities under fair value accounting.

In the debate so far, the JWG has been inclined to favour discounting a bank's liabilities using its current funding rate. That would, of course, take the bank's own credit worthiness into account. As a bank's creditworthiness deteriorated, so its funding costs would rise and the discounted value of its liabilities would fall. On this basis, a bank would probably never appear to be insolvent in the sense of the accounting value of its liabilities exceeding that of its assets. The net value of the bank would simply appear to fall towards zero.

This kind of approach adequately captures the position of a banks' shareholders, who have limited liability and so can lose the current value of the bank but cannot be asked to meet its debts. As the creditworthiness of the bank falls, the shareholder's put option (the shareholder's ability to transfer any negative value to other creditors) increases in value. This creates an asymmetry with the other creditors and counterparties of a bank, who will bear the cost of any net deficiency in assets<sup>35</sup>.

For the depositors, other creditors and counterparties of a bank, a more appropriate discount rate for the liabilities is the risk-free rate. The impact of a higher cost of funding for a bank whose creditworthiness had deteriorated would then be fully recognised in that the value of liabilities in the accounts would rise as the spread over the risk-free rate increased. (It would not be appropriate to leave the liabilities undiscounted, showing them simply at 100, because this would not take into account changes in the overall level of, risk-free, interest rates in the market.)

The example in Box 4 illustrates the issue.

As different parties have different needs, the information in bank accounts would ideally be capable of being recast into different measures. Indeed the IASC 'Framework' states that 'the objective of financial statements is to provide information about the financial position, performance and changes in financial position of an enterprise which is useful to a wide range of users in making economic decisions'<sup>36</sup>. Also, although the ASB establishes investors (potential and present shareholders) as the defining class of user, the 'rebuttable assumption is made that financial statements that focus on the interest that investors have in the reporting entity's financial performance and financial position will, in effect, also be focusing on the common interest that all users have'<sup>37</sup>. In fact things are not so straightforward given the different economic interests of creditors and shareholders in the value of the firm. The payoff structures of debt and equity are quite different, which becomes clear once a move from historical cost accounting to fair value accounting is made.

For banks, the claims of depositors and counterparties far exceed those of shareholders reflecting the high level of gearing. In 1998 only 5 per cent of the total liabilities of the UK banks were accounted for by shareholder funds<sup>38</sup>. This underlines the importance of a calculation of solvency in

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**34:** Duffie and Singleton (1997).

**35:** Berger, Herring and Szego (1995) highlight that using a value for the bank which reflects the option to put the bank's assets to the creditors is unsuitable when calculating regulatory capital.

**36:** IASC (1989).

**37:** ASB (1999).

**38:** Source: British Bankers' Association (1999) 'An Abstract of Banking Statistics'. Shareholder funds and minority interests as a percentage of total assets (excluding long-term assurance funds) averaged 4.8 per cent for the Major British Banking Group in 1998.

## Box 4: Fair valuation of liabilities – an example

Two banks, A and B, both have a single risk-free loan of 100 made in an earlier period, with a remaining maturity of 3 years, carrying a fixed rate of interest of 9 per cent. The risk-free rate is currently 7.5 per cent. The rate of interest on the loan is different from the current risk-free rate because the loan was contracted at an earlier date. Each has shareholders' funds of 5 and floating-rate funding of 95. Bank A is currently paying 11 per cent for its funding, because its credit worthiness has deteriorated on account of known systems and controls problems. Bank B is currently

paying 8 per cent. Tables 1 and 2 show the net worth of the two banks under the different methods.

Under both historical cost accounting and fair value accounting Method A (Table 1), using the own funding rate to discount liabilities, the two banks appear to be equally solvent. However, when the fair value for the liabilities is calculated using the risk-free rate, the weaker position of Bank A becomes clear (Table 2). Method A is arguably more appropriate when valuing a bank for the shareholders, and Method B when valuing it for purposes of credit assessment by counterparties/depositors.

### Historical cost accounting:

Net worth of Bank A = 5

Net worth of Bank B = 5

**Table 1: Fair value accounting using own funding rate to discount liabilities (Method A):**

	Cash Flows			Present Value
	Year 1	Year 2	Year 3	
<b>Bank A</b>				
Assets <sup>(a)</sup> (Discount rate 7.5 per cent)	9.0	9.0	109.0	103.9
Deposit Liabilities (Discount rate 11 per cent)	(10.5)	(10.5)	(105.5)	(95.0)
			Net worth =	8.9
<b>Bank B</b>				
Assets <sup>(a)</sup> (Discount rate 7.5 per cent)	9.0	9.0	109.0	103.9
Deposit Liabilities (Discount rate 8 per cent)	(7.6)	(7.6)	(102.6)	(95.0)
			Net worth =	8.9

(a) No adjustment is made for expected loss because the loan is risk-free.

**Table 2: Fair value accounting using the risk-free rate to discount liabilities (Method B):**

	Cash flows			Present Value
	Year 1	Year 2	Year 3	
<b>Bank A</b>				
Assets <sup>(a)</sup> (Discount rate 7.5 per cent)	9.0	9.0	109.0	103.9
Deposit Liabilities (Discount rate 7.5 per cent)	(10.5)	(10.5)	(105.5)	(103.6)
			Net worth =	0.3
<b>Bank B</b>				
Assets <sup>(a)</sup> (Discount rate 7.5 per cent)	9.0	9.0	109.0	103.9
Deposit Liabilities (Discount rate 7.5 per cent)	(7.6)	(7.6)	(102.6)	(96.2)
			Net worth =	7.7

(a) No adjustment is made for expected loss because the loan is risk-free.

accounts suitable for creditors as well as equity holders<sup>39</sup>.

### Accounting standards and regulatory requirements

As banks are regulated firms, the relationship between accounting standards and regulatory treatment is important. This raises a number of issues.

#### Expected loss provisions and regulatory capital

A general assumption with regard to capital, both regulatory and economic, is that it should cover unexpected losses not expected losses. When a loan is made, the margin (over a bank's funding rate) should be set at a level to cover expected losses. But over time the quality of the loan book may deteriorate to the point where the margin is no longer sufficient to cover the expected loss. With fair value accounting, this would be reflected in the value of the loan book and therefore in the bank's net worth. But with historical cost accounting, banks need to hold a reserve to cover the difference between the book value of the loans, and the current value taking account of credit deterioration.

But even if there has been no deterioration in the value of the loan book there may be a need for a reserve against expected losses. This is because the timing of expected losses in any year is uncertain and they might accrue before margin was received to cover them. Thus there may be a need for a reserve against one-year's worth of expected loss.

Reserves against expected losses should be excluded from capital set aside to cover unexpected losses.

#### Variability in regulatory capital

A further issue from a regulatory (as well as a commercial) point of view is whether a move to full fair value accounting for all financial instruments would result in excessive volatility of capital for regulatory purposes. Bank regulators have generally required the capital set against the banking book to be 'permanent'. This is because of the difficulty which

a bank has, given the illiquidity of its assets relative to its liabilities, in altering the size of its book if its capital suddenly falls. For this reason, apart from one exception<sup>40</sup>, profits are treated as capital only when they are realised. This is to prevent banks counting as capital profits which would in fact be unrealisable quickly – by the time the profits were realised prices could have changed reducing the value.

With fair value accounting, the net worth would change as credit risk in the book altered and as, for example, interest rates changed. There might be a concern that, if a bank's net worth on this basis increased, it could gear up on the extra capital; but if its net worth later fell, the book could not easily be contracted. (It is not possible to make the liquidity test faced by banks sufficiently stringent to enable them to achieve this and also to be able to make substantial volume of longer-term loans). This is perhaps more of a risk with some kinds of change in value than others. The nature of credit risk means that the value of the loan book does not typically exhibit frequent sharp increases and decreases, although it is likely to fluctuate with the economic cycle. Recognition of this pattern in the value of the credit book, if determined by banks' internal loan grading systems, should create no more volatility than if banks adopted expected loss provisioning.

As already discussed, changes in market interest rates could also lead to more volatility in net worth to the extent that banks do not hedge their interest rate exposures. And a further potential source of volatility would be a market value treatment for long-term equity holdings although these positions can already be included in Tier 2 capital under Basel.

Regulators would, therefore, need to consider the possible effect of fair valuation on volatility of capital. There is a range of possible approaches.

One would be to recognise losses due to interest rate movements or equity price changes but not

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<sup>39</sup>: Another question is whether traded bonds issued by a bank should also be discounted at the risk-free rate given that the bank could buy back the bond at the current market price, thereby cancelling the liability at a cost of less than par. The issue is whether, if the market price of a bond issued at 100 is now, say, 80, the bank could benefit by buying it back. This probably gets to the heart of what fair value is trying to achieve. If the fair value is on a going concern basis (which is the only meaningful way of valuing a bank) rather than break-up then it probably is not appropriate to treat marketable bonds issued by the bank in a different way from other liabilities (ie they would also be discounted at the risk-free rate). The bank would not be in a position to buy back the bonds and make a profit because, unless it reduced the size of its balance sheet or issued more equity, it would have to fund the transaction through increased market borrowing and that funding would reflect its current credit standing. Discounting the liability from a bond at the risk-free rate would mean that it might be included in the accounts as a fair value liability of more or less than 100. It would also mean that bonds would be treated differently on the two sides of a bank's balance sheet. Bonds held as assets would be included at the market price but bonds issued as liabilities would be discounted by the risk-free rate.

<sup>40</sup>: One exception is made to this. Under the Basel Accord, unrealised gains in equities can be included in Tier 2 with a discount of 55 per cent (to cover the tax liability which would be incurred were the equities to be realised). The United Kingdom does not allow this treatment of unrealised gains in equities for UK banks.

unrealised profits from these sources. This could, however, lead to distortions in behaviour.

A second possible approach would be to allow all changes in fair value to affect a bank's capital for regulatory purposes but for regulators to set a buffer (like the gap between the target and trigger capital ratios set for UK banks) above the minimum capital ratio to take into account this volatility. This would not be straightforward and would require information on the extent to which volatility would increase following the introduction of fair valuation. A period during which banks disclosed fair values before moving the statutory accounts onto a fair value basis would help.

A third possible approach, in the event of full fair value accounts being introduced without a prior period of disclosure, would be for the regulators to maintain the current definition of allowable capital pending examination of the effect of the fair value method.

There is some evidence of the effect of the introduction of fair value accounting on banks' capital from Denmark, which has used a system akin to fair value accounting for many years both for financial reporting and regulatory purposes (Box 5).

### Summary and conclusion

The nature of banking has changed considerably over the past twenty years. Initially, many of the changes related to types of instrument and the way in which they were used. This led to pressure on the historical cost accounting approach and to the development of the mixed historical/market value model during the 1990s. Over the past ten years some of the biggest changes have been in risk management, which are in turn putting pressure on current accounting practices. Banks are increasingly managing their risks on a whole book basis, and this makes it more difficult for accountants to draw a clear distinction between those financial instruments which should, under the mixed approach, be shown at historical cost and those which should be shown at market value. Eventually as banks integrate their positions in different books, the current mixed accounting model seems likely to become unsustainable.

Changes in risk measurement are already leading to a divergence between the way banks view some instruments and their accounting treatment. Loan books are no longer treated by banks as homogeneous (with all loans having a value of par unless problems occur). Major banks have developed systems to categorise loans according to default probability and also estimate loss given default. These developments are paving the way for regulators to rely on internal processes to set capital requirements for loan books which differentiate between different loans according to their riskiness. As part of this process banks will almost certainly be required to publish information dividing loan books into risk categories. Control of interest rate risk has also evolved, with models now aiming to estimate, for example, behavioural maturities for liabilities<sup>41</sup>. These developments raise the question of how expected losses in loan books and embedded interest rate losses should be treated in audited published accounts.

Under historical cost accounting it would be possible to use provisioning to cover a deterioration in the quality of the loan book (ie any shortfall in the present value of the loan book compared with book value). Likewise provisions could be used to cover embedded interest rate losses, but this would be complex and unreliable without a full fair value approach. At present expected loss provisioning is used in some jurisdictions, but not all, and embedded interest rate losses are probably not covered in any jurisdictions (except Denmark) - they appear in the accounts only over time as income accrues. Thus much could be achieved, even without a move to full fair value accounting, to ensure that accounts more closely reflect underlying economic values. An industry debate on the use of expected loss provisioning would be welcome.

Developments in management techniques within the major banks have, however, gone further, bringing their view of the book much closer to an economic value rather than historical cost basis. This raises the question of whether accounts should not also formally move in this direction, with all financial instruments being shown at fair value.

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<sup>41</sup>: Basel Committee on Banking Supervision (1999).

## Box 5: Fair value accounting, the Danish experience

Under accounting requirements set by the Danish Financial Supervisory Authority, bank accounts have for many years been produced in a way which proxies full fair value accounting with marketable instruments shown at market value and with a provision for non-marketable assets to cover embedded losses caused by deterioration in credit quality or changes in interest rates. Investment securities are accounted for at market value as long as they are quoted (and gains and losses are recorded as a component of earnings and immediately affect owner's equity). Unquoted securities are shown at the lower of cost and market. Off-balance sheet assets and liabilities are marked-to-market and gains or losses are included in earnings. The loan portfolio is 'fair valued' by including a provision which is sufficient to cover known and foreseeable losses ie akin to an expected loss provision which has to be adjusted to reflect current credit-risk assessments. Some rules of thumb are used to assess the effect of collateral on expected losses.

For fixed-rate loans, losses due to interest-rate changes are taken into account but gains are recorded only in so far as they offset previous unrealised losses. Liabilities are not subject to marked-to-market accounting but most are short term and so have values which are relatively unaffected by interest rate changes.

Bernard, Merton and Palepu (1995), explore the extent to which fair value accounting in Denmark has led to more volatile earnings and capital for Danish banks. Overall they find that the fair value adjustments (particularly the price adjustments which are realised, and unrealised gains and losses on investments and fixed-rate loans and mortgages) do contribute to earnings and capital volatility.

They look at the impact which different elements of earnings would have had on banks' capital ratios and at the volatility. They find that on average if pre-tax earnings (before including the primary fair value items) for the six large banks had flowed through into capital, capital ratios would have been increased on average by 13.6 per cent per annum with a standard deviation of 5.7 per cent. Including the main fair value elements (price adjustments and loan loss provisions) reduced the mean additions to capital slightly (to 13.3 per cent) but substantially increased the volatility (standard deviation of 13.4 per cent). But the extra volatility came from the price adjustments (for realised and unrealised gains and losses on investments, interest rate and currency swaps, and fixed-rate loans and mortgage deeds) rather than the fair value of loans (the adjustment for loan loss provisions). Their paper includes the analysis reproduced in Table 3.

**Table 3: Impact of mark-to-market adjustments on volatility of capital<sup>(a)</sup>**

	Six large banks		Sample of 57 banks	
	Mean of Firms' Means	Mean of Firms' Standard Deviations	Mean of Firms' Means	Mean of Firms' Standard Deviations
Impact on capital ratio of:				
Earnings before loan loss provisions, price adjustments, depreciation, extraordinary items, and taxes	13.6	5.7	17.3	5.1
Price adjustments	9.2	17.9	6.4	19.6
Loan loss provisions	-6.3	5.6	-7.5	6.5
Earnings before taxes (including price adjustments and loan loss provisions)	13.3	13.4	14.8	17.4

Source: Bernard, Merton and Palepu (1995).

(a) Impact on the capital ratios for Danish banks (1976-89). Amounts expressed as percentage of capital.

There are a number of complex measurement issues that first need to be explored. In order to ensure that the 'fair value' was one recognised by banks, measurement of value for unmarketable assets would have to rely heavily on internal processes. Although this would raise issues about validation and consistency across banks, a fair value that the banks did not recognise could create marked distortions in behaviour.

The question of the audience for accounts would also have to be addressed. For banks, given their high gearing, published accounts must present a picture suitable for depositors and other creditors and counterparties as well as for shareholders, whose economic interests are different. This may mean different presentations of the accounts for the two interested groups. (The treatment of earnings and taxation would also have to be considered.)

An important question is whether the benefits of fair valuation can be achieved only through a change in the accounts themselves or whether disclosure of fair values in the notes to accounts would meet the same objective. If fair value disclosures were audited, disclosure might achieve the same result in terms of market discipline. However, disclosure would clearly not deal with the strains in the application of the mixed approach.

Nonetheless given the range of issues and their complexity, there might be advantages in adopting full fair value disclosure before contemplating a shift to the preparation of accounts themselves on that basis. This would enable a number of the more complex issues to be explored and addressed in the context of a disclosure regime rather than in the preparation of the statutory accounts. It could thus inform the debate between accounting standard setters, bankers, and the authorities.

## Annex: Steps towards fair value in accounting standards

### Glossary:

- ASB Accounting Standards Board: sets accounting standards in the United Kingdom.
- CICA Canadian Institute of Chartered Accountants: amongst other things, sets accounting standards in Canada.
- FASB Financial Accounting Standards Board: sets accounting standards in the United States.
- FRS Financial Reporting Standard issued by ASB.
- IASC International Accounting Standards Committee: sets international accounting standards (IAS), which countries may choose to adopt.
- JWG International Joint Working Group of Accounting Standard Setters on Accounting for Financial Instruments: partnership of standard setters established to develop a comprehensive standard on accounting for financial instruments.
- SFAS Statement of Financial Accounting Standards issued by FASB.
- SORP Statement of Recommended Practice: accounting guidance for banks issued by British Bankers' Association and Irish Bankers' Federation.

### Accounting Standard Developments:

- 1986 Project to review the accounting treatment of financial instruments added to FASB's agenda.
- 1989 IASC and CICA began a joint project on recognition, measurement and disclosure of financial instruments.
- 1990 SFAS 105 'Disclosure of Information about Financial Instruments with Off-Balance-Sheet Risk and Financial Instruments with Concentrations of Credit Risk' – information to be disclosed about the extent, nature, and terms of financial instruments with off-balance-sheet credit or market risk and about concentrations of credit risk for all financial instruments.

IAS 30 'Disclosures in the Financial Statements of Banks and Similar Financial Institutions', required more information from banks recognising their specific risks.

UK SORP on Securities – securities held for trading purposes to be valued at market price.

- 1991 SFAS 107 'Disclosures about fair values of financial instruments' (effective from 1992) – fair values of all financial instruments to be disclosed in the notes to financial statements.

UK SORP 'Off-Balance Sheet Instruments and other Commitments and Contingent Liabilities' – derivatives held for trading purposes to be recognised on the balance sheet at fair value.

- 1993 SFAS 115 'Accounting for Certain Investments in Debt and Equity Securities' – securities held for trading or 'available for sale' had to be reported at fair value.

- 1994 SFAS 119 'Disclosures about Derivative Financial Instruments and Fair Value of Financial Instruments' – further disclosures about derivatives additional to SFAS 107.

UK ASB commenced a project reviewing the recognition, measurement and disclosure of financial instruments and the treatment of hedging activities.

- 1995 IAS 32 'Financial Instruments: Disclosure and Presentation' – information about factors that affect the amount, timing and certainty of future cash flows relating to financial instruments.

- 1996 UK SORP on Derivatives – derivatives held for trading purposes to be recognised at fair value, with changes in fair value recognised in the profit and loss account.

UK ASB Discussion paper 'Derivatives and other Financial Instruments' – concluded that financial instruments should be measured at current (fair) value and that a standard on disclosure of derivative instruments should be developed quickly.

- 1997 IASC/CICA Steering Committee Discussion Paper 'Accounting for Financial Assets and Financial Liabilities' – advocated all financial instruments should be recognised and subsequently measured at fair value.
- JWG established to develop proposals for a comprehensive and internationally harmonised accounting standard on the recognition and measurement of financial instruments.
- 1998 SFAS 133 'Accounting for Derivative Instruments and Hedging Activities' – established comprehensive reporting standards for recognising and measuring derivative instruments.
- FRS 13 'Derivatives and other Financial Instruments: Disclosures' – required information to be provided about the impact of financial instruments on the entity's risk profile and about the fair values of certain financial instruments.
- IAS 39 'Financial Instruments: Recognition and Measurement' (effective for accounting periods beginning after 1 January 2001) – interim standard similar to SFAS 133, established principles for recognising, measuring and disclosing information about financial instruments.
- 1999 JWG wrote to Joint Working Group of Banking Associations (JWGBA) on 'Financial Instruments: Issues Relating to Banks' (August), explaining why it believed fair value is the appropriate measurement basis for financial instruments for all financial institutions including banks.
- JWGBA responded: 'Accounting for Financial Instruments for Banks' detailed the banks' concerns and rejected some of the explanations in the JWG's letter.
- FASB 'Preliminary Views: Reporting Financial Instruments and Certain Related Assets and Liabilities at Fair Value' – preliminary views on which instruments should be measured at fair value, the definition of fair value, and guidance for determining fair value.
- 2000 JWG draft proposals expected (Autumn).

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# Core principles for systemically important payment systems

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Robust financial infrastructure can help contain systemic risk. Payment systems are at the core of financial infrastructure and they need to be designed and operated in ways which ensure their safety as well as their efficiency. This article looks at an international initiative to provide a universal framework for analysing these issues by establishing core principles for systemically important payment systems. It suggests they reflect a wide consensus and can be used to promote payment system reform throughout the world.

**THE INITIATIVE** is led by an international task force of payment system experts who are establishing the principles that are common to payment system assessment and reform exercises around the world. The work includes looking at counterparty credit risk issues – which were discussed for both payment and securities settlement systems in an article in the previous edition of the *Financial Stability Review* (Hills, Rule (1999)) – but goes broader than that by considering also other financial risks; legal and operational risks; and questions of efficiency, access and governance.

The first part of this article reviews the objectives of the initiative; the second looks at the first results of the task force's work, published in a consultative document in December 1999, including the principles themselves and the thinking behind them; and the third looks at the responsibilities of central banks. The report discusses the key role of central banks in applying the core principles and overseeing payment systems. The article describes also the continuing work of the task force – to elaborate on ways in which the principles can be implemented in different national circumstances. The exercise will be successful only if the principles are used widely in practice, and the article concludes that there are encouraging early signs of this happening, even before the task force's final report has been published.

## The task force on payment system principles and practices

### Financial structure requirements

The crises of the second half of the nineties in Asia and South America revealed serious flaws not only in macroeconomic management, but also in the structure and regulation of financial markets in both debtor and creditor countries. This brought about international policy responses in a number of areas – which were discussed in an article in the June 1999 *Financial Stability Review* (Drage, Mann (1999)). In 1997 an *ad hoc* working party on financial stability in emerging market economies was set up in response to an initiative taken at the June 1996 summit of G7 heads of state and government in Lyon which included representatives of countries in the Group of Ten and of emerging market economies. It set out a strategy for fostering financial stability in countries experiencing rapid economic growth and undergoing substantial changes in their financial system (BIS (1997c)). A major component of this strategy was the development through a broad international consensus of sound principles and practices in areas which were key to maintaining and promoting robust financial systems. One such area where no broad international consensus existed was the design and operation of payment systems.

### Demand from emerging markets

At the same time, the increasing volumes traded in financial markets and the rising values of payments stemming from them were leading many countries to reassess their payment systems and, in many instances, to plan major programmes of reform or development.

Emerging market countries in particular were seeking advice on how this should be done. One particular group of countries seeking advice were those in the former Soviet bloc. In many cases, the initial payment arrangements introduced immediately after the dismantling of the previous government-owned monobanking systems were extremely inefficient and unreliable, and unable to support adequately the banking sector reforms under way. Advice was also being sought by countries in southern Africa, south-east Asia and Latin America. In all these countries progress in payment system reform was being hindered by the absence of a consistent and widely accepted set of guidelines in this area.

### **Establishing the task force**

Central banks have played a prominent role over the past decade or so in world-wide initiatives to improve understanding and standards in payment and settlement systems. In particular the G10 central banks have published analytical studies and have developed guidelines, norms and strategies to improve particular clearing, payment netting and settlement arrangements<sup>1</sup>.

In response both to the 1997 report of the working party on financial stability in emerging market economies and to the demand from emerging market countries, the G10 central banks' Committee on Payment and Settlement Systems (CPSS) decided in May 1998 to establish a Task Force on Payment System Principles and Practices (the 'task force') to develop an overall framework of core principles for the design, operation and oversight of payment and settlement systems for all countries. The principles would represent an international consensus, but would not seek to impose a single model. As with other internationally agreed codes and standards, they would recognise that economies and institutional arrangements vary. In order to find a wide consensus, the group includes, in addition to representatives from the G10 central banks and the European Central Bank, representatives from eleven other national central banks of countries from different regions of the world and in different stages of economic and financial sector development and also representatives from the International Monetary Fund (IMF) and the World Bank (see full list in

Annex). The involvement of the IMF also helped ensure the sharing of ideas with those working on the IMF's Code of Good Practices on Transparency in Monetary and Financial Policies (IMF (1999)).

The first part of the task force's report was published by the Bank for International Settlements (BIS) for public consultation in December 1999<sup>2</sup>. Work is continuing on a second part, which discusses in more detail how the principles can be interpreted and applied in different contexts. The final report is expected to be published by the BIS in the second half of 2000.

### **Systemically important payment systems**

The focus of the task force's report is on principles for payment systems, that is systems that provide for the transfer of funds between financial institutions on their own behalf or on behalf of their customers. The principles may also provide help in evaluating the design and operation of systems involving the settlement of transactions in other financial assets, such as securities, in particular because they often include a system for transferring funds. Securities settlement systems as a whole, however, raise additional financial stability issues in their own right. The CPSS and the International Organisation of Securities Commissions (IOSCO) have therefore established a separate working group to study the specific issues involved in securities settlement. The two groups are working closely together and have some common members including the central bank chairmen of each group.

The task force also agreed from the outset that stronger principles should apply to the most important payment systems. It concluded that to produce principles that necessarily applied to every payment system regardless of its size and impact would result in a watering down of the principles. The report therefore is aimed specifically at the most important payment systems, which it refers to as 'systemically important payment systems'. These are systems which can trigger or transmit shocks across domestic and international financial systems and markets, for example because of the size or nature of the payments which they process, or because of the aggregate value of the payments. A large-value payment system used to

<sup>1</sup>: These include studies of Interbank Netting Schemes (BIS (1990)); Delivery versus Payment (BIS (1992)); Cross-border Securities Settlements (BIS (1995)); Foreign Exchange Settlement Risk (BIS (1996) (1998a)); RTGS systems (BIS (1997a)); Exchange-traded Derivatives (BIS (1997b)); and Over-the-counter Derivatives (BIS (1998b)).

<sup>2</sup>: The draft report, which was approved for consultation by the CPSS and G10 Governors, can be accessed on the BIS's website at [www.bis.org/publ/cpss34.htm](http://www.bis.org/publ/cpss34.htm)

settle transactions in wholesale financial markets, for example the Clearing House Automated Payments System (CHAPS) in the United Kingdom, would fall into this category. It is not only large value systems, however, which may be systemically important. Some retail systems which carry predominantly lower-value payment transfers may also involve larger-value transfers. The notion of a systemically important payment system was developed to make all designers, operators and overseers of payment systems ask themselves whether their particular system, if insufficiently protected from risk, could transmit systemic disturbances. This inevitably involves an element of judgement but the task force thought it best to make explicit the need for that judgement. Part 2 of the report provides further guidance on identifying such systems. The important factor is that the system includes a significant number of payments of high individual value, not necessarily to the exclusion of lower-value payments. It is envisaged that each country has at least one such system.

The report acknowledges that the principles may also be useful in assessing and understanding the characteristics of systems which pose relatively little systemic risk, and that it may be desirable for such systems to comply with some or all of the principles, for instance those relating to operational reliability and efficiency.

### **The objectives of the core principles: safety and efficiency**

By their nature, systemically important payment systems are an essential mechanism supporting the effectiveness of financial markets. The stability of the financial system depends in part on the safety of such systems. If the systems are to be used they also need to be efficient – it is of no use having a very safe system if most large value transactions occur elsewhere. Safety and efficiency are often complementary as improvements in design or operating techniques can deliver more of both, but there are occasions when there may be a trade-off to be made. The core principles explicitly recognise the possibility of such a trade-off by including a principle (VIII) on efficiency.

The report states that safety and efficiency should be objectives of public policy. Individual participants also have an interest in safety and efficiency and

market forces will often support these objectives. But some of the costs and risks of payments systems are not borne by those who create them, for example, the costs of the insolvency of a participant may be borne by other participants, not necessarily in a predictable way, or participants may wrongly assume that the public authorities such as the central bank would support the system in the event of a failure. Such externalities and problems of co-ordination between participants mean that systems may not of themselves achieve adequate levels of safety or efficiency. Public policy therefore needs to address the objectives. The core principles for the design and operation of systemically important payment systems and the report's recommendations for applying them have been developed to help realise these objectives<sup>3</sup>.

### **The audience for the principles**

The principles are intended for use as universal guidelines to encourage the design and operation of safer and more efficient systems world-wide. They are therefore aimed at designers, operators, overseers and users of payment systems. A primary audience, however, is central banks because of their leading role in payment systems, both as overseers and, in many countries, as operators and also as providers of the ultimate settlement asset – claims on a central bank. Central banks in emerging market countries may find the principles of particular use because of the efforts in train in many such countries to improve systems or to build new ones. The principles may also be of use to those offering technical advice and assistance in these areas. One area of application is the joint Financial Sector Assessment Program (FSAP) embarked on last year by the IMF and the World Bank. Its primary focus is the assessment of financial sector vulnerabilities and the identification of development priorities. The process includes an assessment of progress in implementing those financial sector standards which are thought to be key to stability in a particular country (IMF (2000)). The core principles have already been used by the IMF in country assessment and by the World Bank in its technical assistance programme.

### **Updating and broadening the reference of the Lamfalussy Standards**

The task force has drawn extensively on previous work of the CPSS and others in compiling its report, but its

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<sup>3</sup> Safety and efficiency are not the only public policy objectives relating to payment systems. Other objectives, such as crime prevention, competition policy and consumer protection can play a role, but these issues are outside the scope of the task force's report.

prime model has been the Report to the G10 Governors of the Committee on Interbank Netting Schemes, published in 1990, more commonly known as the Lamfalussy Report. This has been very influential. It analysed issues relating to cross-border and multi-currency netting arrangements, established minimum standards and some more general goals for the design and operation of such schemes, and also suggested principles for their co-operative oversight by central banks.

The Lamfalussy standards were designed for a very specific category of systems that were being proposed in the late 1980s and especially for those designed to reduce risks and increase efficiency in the settlement of foreign exchange transactions. They have since been applied well outside their original context, to payment, clearing and settlement systems of many types such as domestic netting systems and automated clearing houses. Part of the task force's brief was to review the Lamfalussy standards and consider whether and how they could be adapted to a broader scope, covering all systemically important payment systems. Six of the task force's ten principles (I, II, III, V, VII, and IX) represent the Lamfalussy standards either in their original form or with some modification. Like the Lamfalussy standards, the core principles also include minimum standards (in Principles IV and V) to apply in all applications of the principles, but with a clear indication that best practice is for these to be exceeded. New principles, not inherited from Lamfalussy, are concerned with efficiency, prompt settlement, the credit risk associated with settlement assets, and governance.

### The management of risk

The core principles reflect the Lamfalussy Report's primary concern with the management of risk. Payment systems can be subject to many risks:

- Credit risk: the risk that a party within the system will be unable fully to meet its financial obligations within the system currently or at any time in the future.
- Liquidity risk: the risk that a party within the system will have insufficient funds to meet financial obligations within the system as and when expected, although it may be able to do so at some time in the future.

- Legal risk: the risk that a poor legal framework or legal uncertainties will cause or exacerbate credit or liquidity risks.
- Operational risk: the risk that operational factors such as technical malfunctions or operational mistakes will cause or exacerbate credit or liquidity risks.

All of these types of risk, whether in isolation or in conjunction with each other, can have systemic consequences: that is the inability of one of the participants to meet its obligations, or a disruption in the system itself, could result in the inability of other system participants or of financial institutions in other parts of the financial system to meet their obligations as they become due. Such a failure could cause widespread liquidity or credit problems and, as a result, could threaten the stability of the system or of financial markets.

### The core principles (see Box 1)

The first core principle is concerned with minimising legal risk. Payment systems should be legally robust – the rules and procedures of a system should be enforceable – and participants should be certain as far as possible of the legal consequences of using them, in particular where the system involves cross-border elements such as foreign bank participation or the use of multiple currencies and where there may be material legal risks stemming from several jurisdictions. There may be specific statutes or case law relating to payment systems which would be relevant. Other aspects of the legal environment in the relevant jurisdictions – for example contract, banking and insolvency law – could also have a crucial bearing on whether the rules and procedures of the system are enforceable. The implementation of this principle can involve substantial amounts of work by specialists and most countries can improve the legal robustness of their payment infrastructure. For example in the United Kingdom the implementation of the Settlement Finality Directive<sup>4</sup> has made more certain that British and European courts would enforce a designated system's rules in the event of the insolvency of a participant.

The concern behind Core Principle II is that system operators and participants should understand clearly the financial (credit and liquidity) risks in the system and where they are borne. The rules and procedures

<sup>4</sup>: See discussion in the Assessment page 75 of the designation of CHAPS.

## Box 1: The core principles for systemically important payment systems

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 and 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.

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.

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.

\*Systems should seek to exceed the minima included in these two principles. Source: Consultative Document (BIS(1999)).

of the system are the main instruments for defining and explaining these risks. Core Principle III takes this one step further: the system's rules and procedures should also define clearly how the credit and liquidity risks can be managed and where the responsibilities for this lie. All parties should have both the incentives and capabilities to manage and contain these risks, and if credit exposures can be produced by participants before final settlement is effected (eg in a netting system), limits should be placed on the maximum level of these credit exposures.

Although a payment system's rules and procedures may ensure that participants are able to understand, manage and contain the risks that they bear, this may still be insufficient if these risks are exacerbated by the length of time the system takes to settle - for example if the exposure extends overnight - or if the asset that participants obtain in final settlement itself carries material risks. The fourth and sixth principles (new principles in this report) state that all systemically important payment systems should, once

payments are accepted for settlement by the system (ie when all relevant risk management tests have been satisfied), provide prompt settlement, at a minimum on the day of value, and that settlement should occur preferably in central bank money. Principle VI states that where a settlement asset other than a claim on a central bank is used it should carry little or no credit risk. The task force's latest thinking is that account should also be taken of whether such an asset brings significant liquidity risk to the system and its participants.

Most countries should aim to have at least one payment system which exceeds the minimum standard of the fourth principle for prompt settlement, ideally by providing real-time final settlement during the day as has already been achieved in many countries. (Box 2 lists countries which have already introduced Real-Time Gross Settlement (RTGS) systems.)

Core Principle V also draws from the Lamfalussy Report, and like Core Principle IV contains a minimum standard. In contrast to the other principles however,

## Box 2: Countries with RTGS systems\*\*

Armenia	Malta
Australia	Mexico
Austria	New Zealand
Bahrain	Norway
Belarus	Poland
Belgium	Portugal
Colombia	Saudi Arabia
Czech Republic	Singapore
Denmark	Slovenia
Finland	South Africa
France	South Korea
Germany	Spain
Greece	Sweden
Hong Kong SAR	Switzerland
Hungary	Thailand
Ireland	The Netherlands
Italy	The Netherlands Antilles
Japan	Turkey
Jordan	United Kingdom
Luxembourg	United States

\*\*As at mid 1999. This list is not necessarily exhaustive. There may be other countries with RTGS systems and some are currently developing them.  
Primary source: Fry et al (1999).

which are applicable to all types of systemically important payment system, it applies only to systems involving multilateral net settlement. This will typically involve the deferral of settlement in the system. In such a system it must be possible, for example by using collateral, to complete the day's settlements even if the largest single debtor to the system fails. The task force adds that best practice has moved on since the Lamfalussy Report; systems that satisfy only this minimum standard are still exposed to the financial risks of the failure of more than one institution during the same business day. Best international practice now is for multilateral netting systems to be able to withstand the default of more participants than the one with the largest single obligation. It is possible to eliminate this credit risk through a different design of the system, such as RTGS. Hybrid designs<sup>5</sup> may also be able to achieve similar effects. RTGS or hybrid designs

are seen increasingly as the best way to reduce or eliminate settlement risk.

Operational risk is addressed in Core Principle VII, and to most market participants this is perhaps the most 'obvious' requirement for a payment system. A systemically important payment system should have standards of security appropriate to the transaction values involved and should maintain a high degree of operational resilience. The precise standards which meet this test will change over time, sometimes - as at present - rapidly, in response to changes in the market for payment services (such as increased demand), and also to technological developments which enable safer, faster, or more efficient processing. Wherever possible a payment system should be designed and operated according to standards or recommendations which have been agreed at an international, national or industry level. Operational resilience, however, means not just reliable technology and adequate back-up of all hardware and software, but also effective business procedures and competent personnel who can operate the system efficiently and safely, and ensure that the correct procedures, including risk management procedures, are followed.

Core Principle VIII (another new principle) addresses specifically the objective of efficiency. While the earlier principles have concentrated on minimising risk for users and hence maximising the safety of the system, this principle acknowledges that a system needs to be efficient and that any trade-off between safety and efficiency has to be recognised explicitly. Little would be gained if a payment system were to be designed with such extensive safety features that it became too slow or expensive to use. System designers will therefore need to consider how to provide the quality and the features demanded by users at minimum resource cost, given the need to meet the core principles limiting risk in the system. The report discusses these concepts in greater detail, and sets out an analytical framework for system design. This should encompass the identification of efficiency requirements; the evaluation of costs (social and private, including not just those that are passed on to participants directly through system charges but also indirect costs, such as cost of liquidity and collateral);

<sup>5</sup>: Such hybrid designs include the Canadian Large Value Transfer System, a net settlement system with a central bank guarantee; the German EAF2, a bilateral matching system; the French PNS; and the planned new form of the US Clearing House Interbank Payment System (CHIPS) with intraday finality, which is expected to be implemented in January 2001.

the identification of resources (social or private); the determination of technological and infrastructure constraints; and the definition of the safety constraints imposed by the core principles.

Core Principle IX extends another of the Lamfalussy standards to all systemically important payment systems. Access criteria that encourage competition amongst participants promote efficient and low-cost payment services. There may be a need to protect the system and its participants from direct participation in the system by institutions that would expose them to excessive risks, but any restrictions on access should be objective, and based on reasonable risk criteria.

The final principle (Core Principle X) deals with systems' governance arrangements. Because a systemically important payment system has the potential to affect the wider financial and economic community, its governance should be effective, accountable and transparent, whether the system is owned and operated by the central bank or the private sector. The report gives some guidance as to what this will mean in practice. A system which complies with this core principle is likely to have a high-level decision-making process which is prompt and communicates clearly to system users. Major decisions are likely to be made only after consultation with all interested parties. Governance arrangements will probably include external elements, independent of those managing the system's operation, with an overall responsibility for the system's functioning and strategy.

### **Interpretation and implementation issues**

The second part of the task force's report is currently being prepared. It provides more details of the issues to be addressed and gives examples of ways of implementing each core principle. It offers guidance, for example, to a central bank on deciding which payment systems are systemically important. It provides some general advice on how the task of payment system review and reform might be approached and carried through. A wide range of structural, technical and institutional factors will need to be considered. Banks, other financial institutions which participate in payment systems and user groups should normally be closely involved in the design choices and in defining user specifications. The active co-operation of some institutions not directly involved in payment systems may also be required; for instance compliance with Principle I could require the involvement of

government and the legislature to establish a legal framework that would be more supportive of the payment systems by making the impact of insolvency law more predictable or by ensuring consistency between payment system rules and insolvency law.

This second part of the report also discusses the effect of different payment system designs and organisational features on the implementation of the core principles. For example, Principle V by definition does not apply to RTGS systems but applies to deferred net settlement systems and possibly to some hybrid systems, whereas Principle IV would apply to all three types of system. Part 2 of the report also looks more closely at the different forms of credit and liquidity risks that can arise in deferred net settlement systems and RTGS systems, and how these can be addressed and controlled - this is particularly relevant to the implementation of Principle III - and at the different types of additional financial resources that can be used by net settlement systems to satisfy Principle V. There is also a discussion of the very specific difficulties in satisfying some of the principles raised by a system that handles paper-based debit instruments such as cheques.

### **The role of central banks**

While a variety of different public sector agencies may have an interest in payment system issues, central banks have a key role to play in overseeing safety and efficiency because of their responsibilities for financial stability, their role in providing settlement accounts for payment system participants, and their responsibilities for the implementation of monetary policy and maintaining confidence in the domestic currency. The expertise they have developed in pursuing these functions gives central banks a particular leading role in respect of systemically important payment systems. This is recognised in the four specific responsibilities of central banks in ensuring that systems comply with the core principles (see Box 3).

In most countries the central bank is itself the operator of at least one systemically important payment system. Compliance with many of the core principles - for example, those dealing with risk controls - is directly under the central bank's control in those instances. The central bank can take whatever actions are necessary to ensure that the systems it operates comply with the principles.

### Box 3: Responsibilities of the central bank in applying the core principles

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 the 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 its oversight.

D. The central bank, in promoting payment system safety and efficiency through the core principles, should co-operate with other central banks and with any other relevant domestic or foreign authorities.

Where a system is not operated by the central bank, it should oversee compliance with the core principles. Oversight procedures can vary between central banks and the responsibilities for applying the core principles are intended to encompass different practices so that they can be applied in a variety of circumstances. A central bank's oversight, however, should always have a sound basis. There may be a variety of means by which this can be achieved. Some countries have a statute-based system of oversight with specific tasks and responsibilities assigned to the central bank and sometimes also to other agencies. Others rely more on custom and practice. Either type of approach can work. Current practices vary widely but are also changing fast. Changes in the institutional structure of payment system oversight have recently been implemented in a number of countries, for example in Australia and Italy. Canada too has given the central bank responsibility to designate and oversee systems of systemic importance. While the detail of the changes varies, there is a trend to more formality and the report suggests that countries newly establishing or significantly revising the oversight role should at least consider a statute-based approach.

Whatever the basis of oversight, all interested parties - including designers and operators of payment systems and participants in the systems - need to have a clear understanding of the central bank's objectives.

This requirement, set out in Responsibility A, parallels the transparency requirements of the IMF Code of Good Practices on Transparency in Monetary and Financial Policies (IMF (1999)). Such understanding, based on disclosure by the central bank, will allow all parties to operate in a predictable environment. There are various means by which clear definition and disclosure can be achieved. Where oversight is statutory, the relevant legislation may well provide a framework for disclosure. Central banks' traditional areas of responsibility, such as monetary policy, are generally set out clearly in the legislation under which they are established or in related legislation which gives them particular responsibilities, powers and forms of accountability; in a number of cases, this is also true of the central bank's role in payment systems. Legislation cannot, however, deal with all eventualities and a central bank should also disclose publicly the major policies it will follow in relation to systemically important payment systems. Such disclosure is in any case desirable on its own merits though means of disclosure vary quite widely. They can include, for example, an informal approach, such as speeches by senior officials, or more formal means such as announcements, notices or papers in official publications. Many countries may also use public consultation before some detailed aspects of the central bank's policies are finalised; this helps to build support for these policies and to avoid unintended effects on the private sector or payment system participants.

The central bank may not be the only authority interested in the safety and efficient functioning of payment systems. The ministry of finance, banking regulators, legislative and competition authorities are amongst those who most frequently also have an interest. The oversight of payment systems, the surveillance of financial markets and the regulation of financial institutions are complementary activities. A central bank should co-operate with these authorities, and where relevant with other central banks and foreign authorities, in promoting the safety and efficiency of systemically important payment systems. Co-operation and information exchange is particularly important for systems with cross-border or multi-currency characteristics (the principles for co-operative central bank oversight set out in Part D of the Lamfalussy Report provide a framework for such co-operation). European Union central banks for example, under the auspices of the European Central Bank, co-operate to oversee the European

Banking Association's Euro 1 system. These same central banks also co-operated by agreeing in 1993 collective minimum common features for payment systems (EEC (1993)). In addition they established arrangements with banking supervisors for the exchange of relevant information.

## Conclusion

The consensus within the task force on the principles seems to be shared widely throughout the world. This unanimity makes the principles a potentially powerful tool because it is difficult for any one country to ignore an agreed world standard. For that reason consultation has been wide and detailed. The task force or some of its members has consulted with other groups of central banks in Africa, the Americas, Asia, the Pacific rim and Europe. Those consulted have said they find it helpful to have consensual guidelines codified and explained in this way. But the ultimate test of success will be whether they are used in practice throughout the world in the way that the Lamfalussy standards have been used for the design of multilateral netting systems.

Early signs are encouraging. Several of the countries which are candidates for accession to the EU are using the draft report when upgrading their payment systems – in Bulgaria, for instance, the National Bank, together with the National Council on Payment Systems, is in the process of building the core principles into the regulations that will govern the RTGS system. Work being undertaken by the Southern Africa Development Community (SADC) to develop a strategic framework for payment system modernisation is drawing on the core principles. Elsewhere, current work on the Western Hemisphere Payments, Clearance and Settlement Initiative (WHI) by the World Bank and the Inter-American Development Bank (IDB), which aims to improve payments and securities clearance and settlement systems in Latin America and the Caribbean, has also made increasing use of the core principles. In addition several countries have carried out assessments of their payments infrastructure against the core principles and, as noted above, the IMF is beginning to use them in its Financial Sector Assessment Programme.

As the volumes and values being transferred through payments systems around the world continue to grow, the robustness of this part of the financial infrastructure becomes more important. Both

developed countries and emerging market economies should assess all their systemically important payment systems against the core principles and, where necessary, make changes or implement programmes of structural reform in a transparent way to ensure compliance with the core principles.

## Annex: Members of the task force on payment system principles and practices

Chairman: John Trundle (Bank of England)

Reserve Bank of Australia  
National Bank of Belgium  
Banco Central do Brasil  
Bank of Canada  
European Central Bank  
Bank of France  
Deutsche Bundesbank  
Hong Kong Monetary Authority  
National Bank of Hungary  
Bank of Italy  
Bank of Japan  
Bank Negara Malaysia  
Bank of Mexico  
Netherlands Bank  
Central Bank of the Russian Federation  
Saudi Arabian Monetary Agency  
Monetary Authority of Singapore  
South African Reserve Bank  
Sveriges Riksbank  
Swiss National Bank  
Bank of England  
Board of Governors of the Federal Reserve System  
Federal Reserve Bank of New York  
Central Bank of West Africa (BCEAO)  
International Monetary Fund  
World Bank  
Bank for International Settlements (Secretariat)

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# Two international financial stability issues:

## asset price inflation and private sector participation in financial crisis stabilisation

E. Gerald Corrigan

We are extremely grateful to Gerald Corrigan, Managing Director of Goldman, Sachs & Co, for permission to print the text of his Roy Bridge Memorial Lecture delivered on 10 May 2000. The event was organised by ACI UK – The Financial Markets Association.

Good evening Ladies and Gentleman and allow me to begin by saying how pleased and honoured I am to have been invited to deliver the millennium edition of the Roy Bridge Memorial Lecture. In looking over the list of speakers who have preceded me at this podium, I was struck by the fact that a majority of them were Central Bank Governors and a clear majority of them were distinguished public servants. While I can no longer claim to be either, I hope you will find that my remarks lend some credence to the view that you can get the individual out of the Central Bank but you can't get the Central Banker out of the individual.

My remarks tonight will centre on two especially difficult and controversial issues relating to our quest for greater stability in the workings of the international financial system. They are, first, the question of whether, or in what circumstances, monetary authorities should respond directly to asset price inflation; and second, what might be done to encourage greater private sector voluntary participation in sovereign financial crisis stabilisation programmes.

### Historical perspective

Before turning to the specifics, let me briefly provide a little perspective. As this audience knows very well, the last twenty years have witnessed a substantially greater number of serious financial shocks than occurred in the preceding thirty-five years of the post-war period. At least several of these shocks had

the potential for causing systemic damage to the world economy. While we have managed to avoid a global meltdown, many individual countries and financial institutions have paid a very high price for financial adversity. Also, in far too many instances, financial shocks and disturbances have been mitigated largely by massive governmental intervention, often involving huge fiscal costs that will be borne by successive generations of taxpayers in many individual countries.

The frequency and magnitude of the recent pattern of financial shocks are such as to raise the question of whether there may be an element of inherent instability in contemporary global finance. While I believe this is not the case, I must also confess that it is likely that periodic bouts of financial volatility and instability will be with us for at least the broadly foreseeable future. Thus, the dual challenge we face is, first, to manage our affairs such that the frequency of such events will be reduced, and second, to better manage these problems when they arise, thereby containing the damage, reducing systemic risk and reducing the need for large scale official intervention.

On the whole, and despite the recent traumatic events in global equity markets, I believe it is entirely fair to say that genuine progress is being made in public and private efforts to enhance the stability of the international financial system. As examples:

- Risk management practices at private institutions are continuously adapting and improving even if it is true that risk management systems can never be remotely failsafe.
- Supervisory practices and tools are becoming more rigorous while at the same time taking on desirable elements of added flexibility.
- The overwhelming majority of emerging market countries is making solid progress in addressing both their macroeconomic and structural policy agendas.
- Transparency is on the rise almost everywhere on the financial landscape.

The pipeline of further enhancements in public policy and private initiative is at capacity as reflected by such efforts as the emerging new Basel Capital Accord, the recommendations of official groups such as the Financial Stability Forum and the recommendations of private groups such as the Counterparty Risk Management Policy Group.

In pointing to these areas in which progress is being made, I am under no illusion that the observed tendencies for financial markets to overshoot in both directions will not remain a matter of serious concern, which it surely will. In that regard, I find it ironic that this tendency is being amplified by the very changes in information technology that are working to increase the efficiency of the financial sector and of the economy as a whole. Of course, overshooting in financial markets is hardly a new phenomenon. Indeed, as much as we might wish it were otherwise, for decades, if not for centuries, financial market behaviour seems to periodically take on herd-like characteristics. That is not new; what is new is that the herd is much larger and it travels much faster.

While acknowledging that the tendency for markets to overshoot is a matter of concern, I must hasten to add that I do not see any quick and easy solutions for this problem. As an example, greater stability in exchange rates – especially among the world's three major currencies – has great intuitive appeal. However, achieving that goal would seem to require some form of a quasi-administered exchange rate regime. As I see it, we now have neither the degree of convergence in economic performance nor the broad-based political

consensus that would permit such a policy shift. Moreover we are not likely to have such convergence or consensus for the foreseeable future. While it may be wishful thinking, I cling to the hope that the day will come in the not-too-distant future when we will see a more orderly framework within which the key global exchange rates can better play their role in helping to allocate scarce resources on global scale. In the interim, however, volatility among the major exchange rates will continue and most emerging market countries will have little practical choice other than to rely on floating exchange rate systems.

Another vexing problem, that is reflected in the tendency of markets to overshoot in the relatively short run, is the phenomenon of asset price inflation in the presence of broadly satisfactory economic performance in a setting of low overall inflation. Whether it is in real estate or financial assets, we are all familiar with countries that have experienced this phenomenon in recent years. In some cases, markets have done a reasonable job of sorting out these situations with relatively little macroeconomic, much less systemic, damage. In other cases, however, asset price inflation scenarios have worked their way into economic structures more generally, with the result that their resolution has come at a substantial cost in macroeconomic – to say nothing of human – terms.

### Asset price inflation - should the monetary authorities act?

Not surprisingly these events have called into question whether monetary authorities can, or should, 'do something' to head off or contain asset price inflation even when there is little or no evidence to suggest that such developments are having a material impact on overall inflation or inflationary expectations.

This situation presents an acute dilemma for monetary authorities. For example, if the monetary authorities are to 'do something', about all they can do is to tighten credit conditions by raising interest rates. However, higher interest rates are a flexible, but blunt, tool which may have disproportionately large effects on sectors of the economy that are not experiencing asset price inflation, and delayed and uncertain effects on the asset price inflation process itself. With economic performance otherwise satisfactory, raising interest rates in such circumstances is not an easy policy to articulate and explain to markets, to the public at large or to

governments. Indeed in the extreme, such actions could erode public and political support for monetary policy generally in a setting in which there can be no compromise in the core principal that the most important thing central banks can do to contribute to the goal of economic growth and stability is to rigorously stick to the basic goal of monetary policy; namely, overall price stability, appropriately defined. Having said that, there may be cases in which selective asset price inflation does represent a threat to the goal of overall price stability. That may occur, either because the asset price inflation becomes so virulent – as with energy prices in the 1970's – as to directly escalate the inflationary process generally, or because of the indirect effects of rising asset prices on the aggregate demand-supply situation. In the former case, policy must be tightened whereas, in the latter case, it may be appropriate for selective asset price inflation to induce a 'tilt' in monetary policy toward greater restraint. However, any such 'tilt' is an entirely different matter than specifying selective asset prices as a direct target for monetary policy. That, in my judgement, would be a mistake. Of course, if faced with serious and destabilising asset price deflation, a policy 'tilt' in the direction of ease may also be appropriate so long as the risks that such a policy tilt will not undermine the price stability goal are exceedingly low.

What I have just said carries with it a powerful implication. Namely, the task of checking selective asset price inflation should be left primarily to the market place and to the private institutions and individuals that constitute that market place. In turn, that implies that market participants are going to have to exercise greater self discipline and prior restraint or they are going to have to be prepared to pay a hefty price for not doing so.

In suggesting the above, I am not saying that public policy has no role in helping to check sharp and ultimately unsustainable run-ups in asset prices. To the contrary, supervisory policies, for example, can play a constructive role in this regard. Similarly, I believe officially mandated instruments such as the Fed's 50 per cent initial margin requirements on stock purchases are a useful discipline even if I also believe that seeking to change such margin requirements in a countercyclical manner entails risks that such changes may be ineffective, counterproductive or both. However, I would also emphasise that individual firms and other suppliers of

margin credit should not be shy about requiring initial and/or maintenance margins that are above regulatory minimums where case-by-case counterparty credit considerations warrant such actions. Finally, I believe that the widespread practice of day trading on Main Street is raising important issues of suitability which may need more careful scrutiny by regulators or by self-regulatory bodies. Maybe I'm too old fashioned, but the film clips we see on the nightly news of countless Main Street individuals glued to their trading screens conjures up in my mind the atmosphere of a Las Vegas casino.

### Public and private sector participation in financial stabilisation programmes

While on the subject of vexing issues relating to financial stability, let me turn to another matter for which there are no easy answers. Namely, the question of how best to secure an appropriate balance between public and private sector participation in financial stabilisation programs for individual countries that are on the edge of, or in the midst of, a major financial crisis.

In considering this subject, it goes without saying that the best solution for the sovereign financial crisis problem is strengthened efforts aimed at crisis prevention. As noted earlier, real progress is being made in this regard both by individual countries and by the international community more generally. However, even with the best of efforts and intentions, the world will never be immune from sovereign financial crises even as we work towards reducing the frequency and severity of these events.

The history of sovereign financial crises over the past 20 years tells us in unmistakable terms that each crisis has its own unique causes and characteristics. What is not unique, however, is the immediate trigger for the crisis. That never changes because the trigger is always the fact that the country in question is literally about to exhaust its supply of foreign currency reserves. Once a country finds itself on that razor's edge, its short run policy options are severely limited and they are all bad. Those options are:

- I. Selective or generalised default, however labelled.
- II. Restructuring existing obligations.
- III. Securing new foreign currency resources from private sources.

IV. Securing new foreign currency resources from official sources.

V. Some combination of the above.

In the 1980's-style LDC debt crisis the typical 'solution' involved some new money from both official and private sources and more or less simultaneous large-scale restructurings of existing debt. This package approach was made relatively workable by virtue of the fact that (1) the debtor was essentially the sovereign itself; (2) there were only a relative handful of private creditors; (3) the credit instruments were more or less plain vanilla bank loans; and (4) the core underlying problems were macroeconomic in nature. There was another key feature of the situation in the 1980's that warrants special mention. Namely, a substantial fraction of the bank exposure to troubled countries was concentrated in a very small number of internationally active banks whose capital and reserves were woefully inadequate relative to their exposures at the time. For these banks, there was little or no choice but to participate in the 'voluntary' restructurings that were central to the stabilisation efforts of the early to mid 1980's.

By the time of the Asia crisis of the late 1990's, circumstances were very different. For example, the primary debtors were private institutions; the creditors numbered in the thousands; the credit instruments ran the gamut; and the underlying problems were primarily structural in nature, not macroeconomic. However, what remained true was that at the point of crisis the troubled countries in Asia were still facing the bad alternatives mentioned earlier for bolstering their foreign currency reserves.

As one would therefore expect, the stabilisation efforts in Asia in the 90's were different than was the case in Latin America in the 80's. One especially large difference was that in Asia timely restructurings of existing debt loosely linked to official disbursements of new money played a much less important role than in Latin America. As an entirely practical matter the vast number of creditors and debtors and the diversity of financial instruments made such timely restructurings virtually impossible, except in limited instances such as the Korean unsecured inter-bank credit facilities. Indeed, the situation in Asia provided a forceful wake-up call to the effect that the days of bringing together the debtor and the creditors into a

single room and engineering voluntary restructurings on a grand scale were over. The result of this was that, at the point of the crisis, official financing became more important and private financing became less so.

This turn of events brought into even sharper focus two closely related issues that had been a matter of growing concern for some time. The first was the so-called moral hazard problem associated with official intervention in sovereign financial crisis; and the second was how to secure a better balance of public and private financing at the point of the sovereign crisis. The latter issue came to be described by the unfortunate term of 'bailing-in' private creditors.

In the arena of finance, the moral hazard doctrine essentially says that the fact, or the perceived likelihood, that the official sector will step in with chequebook in hand to stabilise financial disturbances, thus sheltering private parties from loss, prompts private parties to act in an undisciplined and reckless manner that induces instability and creates the self-fulfilling prophecy that the official sector will step in to stabilise the situation.

There can be no doubt that the events of recent years have given meaning to concerns about financial moral hazard. However, while the problem is real, I believe it tends to be exaggerated in that, while official actions have cushioned countries and their creditors and investors from even larger losses, it can hardly be said that substantial losses have not occurred for debtors and creditors alike. Indeed, even in the 1980's the losses ultimately incurred by creditors by the debt relief associated with the Brady Bonds ran into the many billions of dollars. On the other hand, there probably are cases where creditors and investors made bets on the premise that some form of official protection would be there. Russia, which was seen by some as too nuclear to fail, may be the best example of this phenomenon.

Accordingly, there is something to the view that financial stabilisation at the moment of crisis should not be left exclusively to the official sector. Equally, there is something to the view that, at the point of crisis, equity considerations would suggest that various classes of private creditors should share in the burden of stabilisation. Achieving the latter, however, is not easy, if for no other reason than some creditors and investors are subject to immediate

mark-to-market losses, while others are not; and some creditors may be subject to immediate provisioning requirements, while others are not. In these recent circumstances, we have seen examples involving a few small countries in which the official community has taken the position that the official financial support must be conditioned on the country securing some form of private participation in financial rescue operations, even if that means *de facto* default on international obligations, including Brady Bonds. In the limited cases where this has occurred, spill-over or contagion effects have been minimal, in part, because the countries in question have been so small in absolute size or in the size of their external liabilities. For those very reasons, however, I believe it would be a serious mistake to conclude that these limited cases constitute a prudent basis upon which to base policy more generally.

Looking to the future, the acid test for our efforts to better manage sovereign financial crisis, will occur when (not if) a large or otherwise important country is facing a substantial foreign currency liquidity crisis, notwithstanding the fact that there are reasonable grounds to believe that the country can and will mount the policy initiatives to mitigate the crisis over time. But, in the short term, the liquidity crisis is such that the country is faced with the need to raise several or multiple billions of foreign currency balances.

In these precise circumstances, meaningful private sector participation in such interim financing can only come from limited sources as follows: first, outright provision of new money through the extension of new bank or capital market credit on a voluntary basis. Second, the prompt restructuring of one or more classes of existing debt on a voluntary basis so as to provide substantial cash flow relief. Third, the suspension of payment on some or all existing obligations through the means of a voluntary standstill-type agreement. Fourth, the unilateral suspension of payment on some or all existing obligations. Some have gone so far as to suggest that such unilateral actions might be forthcoming with the tacit sanction of the multilateral official institutions.

Speaking as someone who has had considerable first-hand experience in managing sovereign financial crises in both the 80's and the 90's, I am deeply troubled by the practical and policy implications of

these alternatives. On practical grounds, I have grave doubts as to whether either the first or the second alternatives are workable on a timely basis. I say that recognising that there is a considerable body of opinion that suggests that institutional changes such as collective action clauses in bond contracts could facilitate the prompt restructuring alternative. Even in the presence of such arrangements, I am hard pressed to imagine that restructurings that can produce large-scale cash flow relief can be executed in a timely fashion. Perhaps, in time, sufficient institutional changes will be made so as to enhance the workability of the restructuring alternative but for now I believe it would be unwise to assume that this alternative is a practical approach to securing meaningful private sector participation in sovereign crisis rescue packages. As to the outright new money alternative, I simply do not see it as viable at the peak of a crisis situation.

The third, or voluntary standstill, alternative is one that has some history in the context of sovereign financial crisis. For example, there have been examples in which countries and their creditors have informally agreed to keep in place maturing short-term bank credit facilities for intervals of time, pending the finalising of policy reform and overall financing programs. While such efforts have had a measure of success with inter-bank credit facilities, I personally do not know of any instance in which standstills have been successfully used for other classes of credit instruments or creditors as a part of short-run sovereign liquidity crisis management.

Thus, while there may be some future role for truly voluntary standstill agreements as applied to selected classes of credit and creditors, it is hard to make the case that this channel constitutes a viable and generalised approach to the problem. Indeed, in point of fact, the best solution to the problem of maturing short-term inter-bank facilities is for countries to avoid the extreme clustering of such maturities we have seen in so many crisis situations.

The fourth alternative – unilateral default – should be avoided at virtually any cost. Indeed, not only is this approach a recipe for potentially even greater instability but it also represents a clear and present danger for what I like to call the culture of credit. This would be especially true if such an approach were tacitly – much less overtly – sanctioned by the multilateral official institutions.

## Summary

To summarise, unless we proceed cautiously, when the next major sovereign financial crisis occurs, we may find ourselves facing a situation in which both official and private creditors have been backed into a corner that leaves little manoeuvring room to strike workable and prompt responses to the type of sovereign crisis situation described earlier. To me, that possibility suggests the following: first, the premium on crisis prevention – including regular ongoing dialogue between countries and their creditors and investors – is absolutely central. Second, the principles of case-by-case, co-operative, and voluntary responses to sovereign financial crisis must be maintained even as the practical application of those principles continues to evolve with changing circumstances. Third, securing an appropriate balance of private-public participation in crisis mitigation must find a middle ground between approaches that are not likely to be workable in a timely fashion and approaches such as *de facto* defaults that are both bad precedents and bad policy. This, in my view, requires some fresh and aggressive thinking.

As a part of that fresh thinking, it may be true that carefully designed and mutually agreed upon standstills for narrow and selective classes of maturing short-term credits still have a role to play. It may also be true that there is a larger role for private sector standby credit facilities – so long as such facilities are structured and priced on true market terms that recognise that such facilities are likely to be drawn only in a crisis situation.

There is another, and controversial, possibility which I believe warrants consideration as part of a menu of choices. Namely, in extraordinary circumstances, the possible use of limited, temporary and partial official credit enhancements for private sector credit extensions at the point of crisis. Such credit enhancements could take many forms, ranging from plain vanilla guarantees of interest payments for a short duration on a specified class of new loans or new capital market placements, to highly-structured, one-time capital market placements that might, for example, have a put feature for a limited period of time and at a market price well below the issue price. Of course, if the notes or bonds were put to the multilateral institutions, the obligation of the sovereign to fully service and repay the principle would remain intact.

Obviously, I recognise that any such credit enhancements would entail contingent liabilities on the part of the multilateral official institutions. However, the amount and nature of those contingent liabilities must be viewed in the context of several key considerations including the following: First, the presence of such contingent liabilities should be considered in light of the possibility that the alternative might well entail larger direct exposures to the country by the official sector. Second, an important part of the risk associated with such special instruments would fall on the private sector. Third, if carefully designed and combined with a menu of other official and private actions, such an approach can provide incentives for private participation and incentives for reasonably rapid turn-around in the troubled country such as we have seen in Mexico in 1995 and Brazil, Korea and Thailand in 1998-99. Finally, compared to the alternative of *de facto* default (especially if sanctioned), almost any alternative is superior.

I raise this controversial possibility not because I see it as anything like a panacea. Indeed, the concept is not without issues of both a pragmatic and philosophical nature. However, I believe the concept should be on the table as one possible approach to providing a flexible menu of options to encourage private sector participation in particular situations involving sovereign liquidity crisis.

One way or another we must be prepared for a future in which sovereign financial crises will occur; a future in which massive official financing at the point of such crisis will not be politically acceptable among the creditor countries and multilateral official institutions; and a future in which attempts to force private participation in such financing efforts by whatever means will fail and, even worse, will result in greater instability. That is why we need some fresh thinking consistent with the philosophy of flexibility, co-operation, pragmatism and volunteerism.

The two issues I have discussed with you this evening will be with us for some time to come. I hope my observations will help stimulate the discussion and dialogue that will help us all see our way clear to an environment of greater financial stability and well-being for all.

Thank you

# Collective action problems and collective action clauses

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The inclusion of collective action clauses (CACs) in bond contracts could be a positive step towards improving crisis resolution procedures. CACs can help facilitate the restructuring of bonds, which are becoming an increasingly important borrowing instrument for emerging market economies (EMEs). Almost one-third of EME sovereign bond issues include CACs, and experience so far suggests that CACs may have played a useful role during some restructurings. Empirical evidence is mixed, but tends to indicate that, to date, CACs have not materially affected the cost of borrowing.

**IN RECENT YEARS**, there have been several attempts by the official sector to promote CACs in bond contracts as a way of improving crisis resolution procedures<sup>1</sup>. An academic study by Eichengreen and Portes (1995) recognised the potentially useful contribution of CACs in sovereign debt restructuring. And many market participants have acknowledged their possible merits, although some remain opposed.

Why has the official sector sought to promote CACs? There are several reasons. The experience of financial crises since 1994 – in particular in EMEs – has clearly been an important driver. The original study by Eichengreen and Portes was prompted by the Mexican case in 1994-95, where at least initially no clear mechanism for debt restructuring was evident. But subsequent crises in east Asia, Russia and Brazil and localised debt servicing difficulties elsewhere<sup>2</sup> have shown that the Mexican crisis was not an isolated incident.

The recent trend towards bonds for EMEs' external financing has also increased the impetus behind the promotion of CACs. In 1980, bonds comprised only 2 per cent of developing countries' external debt of US\$600 billion<sup>3</sup> and the 1980s debt crises largely

involved syndicated bank loans. But by 1999, international bonds accounted for 19 per cent of developing countries' US\$2.6 trillion of external debt. So it is becoming increasingly likely that, if a country experiences debt-servicing difficulties, bonds will be involved. While not designed *exclusively* for use in distressed circumstances, CACs can help to facilitate bond restructurings because they allow a qualified majority of bondholders to vote to bind all the bondholders to a change in the bonds' terms and conditions.

This article seeks to explain the role of CACs in facilitating debt restructuring. It assesses their prevalence and their effect on bond pricing, in theory and in practice. It also reviews recent practical experience of the adoption and use of CACs.

## Collective representation and majority action problems

The restructuring of bonds or loans gives rise to problems of *collective representation* and *collective action*. But the problems tend to be more acute with bonds than with loan contracts because bondholders are typically more diverse, more at arm's length and less easily identified than members of a loan syndicate.

<sup>1</sup>: The G10 report 'The Resolution of Sovereign Liquidity Crises' (1996) and the G22 'Report of the Working Group on International Financial Crises' (1998) both recommended the adoption of CACs in sovereign bond contracts. More recently, communiqués by the G7 in June 1999 and April 2000, and the G10 in September 1999 and April 2000, confirmed that the official sector believes that CACs can potentially play a role in crisis resolution. See also Drage and Mann (1999).

<sup>2</sup>: In Pakistan, Ecuador and Ukraine amongst others.

<sup>3</sup>: Source: World Bank Global Development Finance 2000.

*Collective representation problems* are largely administrative – it is difficult to call and hold meetings between the debtor and a diffuse group of anonymous creditors.

*Collective action problems*, on the other hand, are behavioural. Like other types of market externality, collective action problems arise when there is a difference between the individual (private) and the collective (social) returns related to a given course of action. In the context of a debt restructuring, bondholders can face a classic prisoners' dilemma: it may be rational for each individual bondholder to litigate following default in order to try to reclaim their assets through the courts<sup>4</sup>. But because only the bondholders who act first are likely to be paid out in full, each may aim to pre-empt the others<sup>5</sup>. Any resulting fire-sale of assets could reduce their value in aggregate, meaning that, in acting individually, investors end up receiving less than if they had co-operated. Indeed, this kind of co-ordination problem may arise ahead of a debt restructuring, if collective action problems themselves precipitate a crisis<sup>6</sup>.

Why are collective action problems likely to be greater with bonds than with loan contracts? International loans are typically made by a syndicate of banks, under arrangements that encourage members of the syndicate to behave in a more co-operative fashion than does standard bond documentation. A bank syndicate is normally smaller and each member will often be known to (and work with) the others. By contrast, bondholders will not necessarily be aware of the identity of other bondholders. Moreover, it is still more difficult to transfer a loan than to sell a bond, and bank syndicate members will typically have obligations to each other (such as being required to share any proceeds from litigation<sup>7</sup>).

CACs in bond documentation are designed to help to address these collective representation and collective action problems, and in this way facilitate bond

restructuring. The next section describes how CACs operate in practice.

### International bonds and CACs

There are four types of CAC<sup>8</sup>:

- **Collective representation clauses** set out mechanisms for co-ordinating discussions and possible action between the issuer and bondholders (eg through a trustee).
- **Majority action clauses** allow a qualified majority of creditors to agree to a change in the terms of a debt contract which is binding on any dissenting bondholders.
- **Sharing clauses** ensure that all payments from the debtor are distributed between creditors on a pro-rated basis.
- Finally, **non-acceleration clauses** require a minimum threshold of bondholders to demand immediate repayment of principal following default.

The first two – collective representation and majority action – address the problems described above most directly. Partly for that reason, these are the ones that are being most actively pursued by the official sector. Non-acceleration clauses also encourage creditors to act collectively by constraining the ability of individual creditors to seek unilateral legal remedies. To date, sharing clauses have not had a major role in the CACs debate.

There are important practical issues in the design of majority action and collective representation clauses: for example, in choosing the threshold for majority voting and the required quorum at either an initial or adjourned bondholders' meeting. The thresholds need to strike a balance between preventing individual creditors from derailing the actions of the majority, while preserving reasonable rights of individual creditors and not allowing potential abuses

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4: In practice, successful litigation against sovereigns has been rare, but the mere threat of litigation can be potentially disruptive.

5: There may be some incentives for bondholders to pursue collective solutions even in the absence of CACs. If a similar group of bondholders is involved in another country's bond restructuring, or bondholders are concerned that the borrower may seek to restructure the same debts, their long-term claims may be maximised by acting collectively. So, in the context of the prisoners' dilemma, bondholders act as if it is a repeated game.

6: There are several recent models of crisis that operate in this way: for example, Chang and Velasco (1998), Morris and Shin (2000), and Chui, Gai and Haldane (2000).

7: Sharing clauses are routinely included in syndicated bank loans.

8: See, for example, Buchheit (1998)

by a debtor (such as encouraging state-owned banks to purchase sufficient bonds to vote through a restructuring that runs against the interests of other creditors).

There are no universally optimal thresholds but, when majority action clauses have been included in bond contracts, the most common threshold has been 75 per cent. Some market participants are not convinced that this level is high enough to provide adequate protection for bondholders, and they would prefer a higher threshold of perhaps 90 per cent. In practice, this might be difficult to attain, although the recent sovereign restructurings in Pakistan and Ukraine did both achieve over 90 per cent acceptance of bondholders.

The minimum quorum for bondholders' meetings is normally set at two-thirds of principal outstanding for a first meeting and one-third at an adjourned meeting, but is sometimes set at 75 per cent and 25 per cent (eg in Pakistan's international bonds). *In extremis*, a 75 per cent majority vote at an adjourned meeting where the quorum was 25 per cent, could enable bondholders holding only 18.75 per cent of principal to vote through changes to the payment terms which all bondholders would be bound to accept. But an alternative view is that a low quorum might encourage bondholders to turn up, since they can be more confident that a meeting would be quorate. If bondholders choose not to turn up, they should have less reason to challenge decisions made by those who do.

Even where bonds do not contain majority action clauses, amendments to the terms of a bond other than the payment terms can usually be made by a majority vote of bondholders. It has been suggested that one way to encourage bondholders to participate in a restructuring might be through an 'exit consent'<sup>9</sup>. Bondholders who agreed to exchange the old bonds for new ones with different payment terms could, in addition, amend the old bonds' documentation (eg remove a waiver of sovereign

immunity<sup>10</sup> or negative pledge clauses) to make the old bonds less attractive, and so encourage take-up of the exchange offer.

There are various possibilities for addressing the collective representation problem. Under English trust law, a trustee represents the interest of bondholders, and has the potential benefit that no individual bondholder can unilaterally launch litigation (see Box 1 on Trustees)<sup>11</sup>. The trustee must ensure that all bondholders are treated equally with respect to any payments arising from litigation (a *de facto* sharing clause), which brings an added reason for bondholders to act collectively.

A more informal mechanism through which debtors can communicate with their bondholders is to invite the larger institutional bondholders to sit on a 'consultative group'. This has been Ecuador's preferred route following default in September 1999.

A final option is to establish a bondholders' protective committee akin to the UK's Council of Foreign Bondholders (CFB) which was active in representing sterling bondholders in disputes from the 19th century to the 1930s<sup>12</sup>. The CFB would approach sovereign issuers of defaulted bonds on behalf of bondholders and try to secure the best possible terms for a settlement or resumption of payments. Settlements were eventually reached, but negotiations were often protracted (taking years or even decades), and all parties complained of wasteful dissipation of resources (Eichengreen and Portes (1995)).

### Potential costs of CACs

As well as the potential benefits of CACs, there may be potential costs.

- 'Friends of the debtor' (such as state-owned banks) could commandeer the restructuring process by buying up the debt. Higher quorums for bondholders' meetings or exclusion from voting of

<sup>9</sup>: See Buchheit and Gulati (2000).

<sup>10</sup>: The laws of many countries recognise the immunity of foreign sovereigns and their property from the jurisdiction of local courts. This immunity, however, can be waived in the underlying contract and, even in the absence of an express waiver, is often not available in cases involving a sovereign's commercial activities outside its own country. Most EME sovereigns accept express waivers of sovereign immunity in their foreign bonds. The effect of removing an express waiver of sovereign immunity in such a bond would be to force prospective plaintiffs to establish some other basis for overcoming the immunity enjoyed by sovereign defendants and their property held abroad.

<sup>11</sup>: Unless an individual bondholder held more than the minimum threshold (typically 20-25%) needed to instruct the trustee to take legal action.

<sup>12</sup>: The CFB was established in 1868 and wound up in 1989.

## Box 1: Trustees

Under English law, bonds can be issued under a trust deed. Under a typical trust deed, a trustee has discretion to make certain modifications to a bond contract of a technical nature, and is able to waive insignificant breaches of the terms of the bonds. Trustees have a duty to represent the interests of all bondholders, rather than being an agent of the borrower.

In the context of sovereign debt restructuring, the trustee takes action on behalf of all bondholders, and the trustee's action binds all bondholders. The presence of a trustee therefore brings the potential

benefit that individual bondholders cannot themselves launch litigation (the trustee must generally be instructed by creditors holding a minimum proportion of principal, commonly 20 or 25 per cent). The trustee must also ensure that all bondholders are treated equally with respect to any payments arising from litigation (on a pro-rated basis).

The cost of appointing and remunerating a trustee is not usually a material consideration, but trustees are still unusual in sovereign issues. Many bondholders may prefer to represent themselves in negotiations, and anecdote suggests that, in the past, trustees may have been reluctant to take action for fear of being sued themselves by disgruntled bondholders.

connected parties could potentially help to address this concern.

- CACs could conceivably increase countries' willingness to default by making restructuring easier, and therefore increase the issuance cost to the debtor. A later section and Box 2 explore the possible price effects of CACs.
- Bondholders' meetings could be used to organise opposition to a proposed restructuring. A possible way to overcome this was demonstrated by Ukraine in its recent exchange offer: Ukraine asked bondholders consenting to the exchange offer to pass their votes to a proxy who would vote on their behalf at the bondholders' meeting.
- CACs are likely to be included only in new issues, unless there is a conversion of the entire stock of existing issues. This means that a two-tier bond market could develop, which might reduce liquidity<sup>13</sup>. This is a transitional problem.

### Prevalence of CACs

Provisions for bondholders' meetings and majority action clauses are routinely included in bonds

governed by English law<sup>14</sup> and Luxembourg law, but not in bonds governed by New York, German or Japanese law. The exclusion of CACs from sovereign bonds under New York<sup>15</sup> and German<sup>16</sup> law arises from market convention rather than any legal requirements. It is unclear whether a clause restricting the rights of individual bondholders to launch litigation would be valid under Japanese law.

Just under half (by number) of all international bonds issued since 1990 have been governed by English law, compared with 19 per cent for New York law (see Table 1). These proportions are similar for sovereign and private sector issues. English law accounts for around 30 per cent of EME issues, but there are large geographical variations in the use of other governing laws. For example, New York law is more common for Asian and Latin American issues; Japanese law governs around a quarter or more of sovereign Asian issues (compared with only 2 per cent of all international bond issues); and German law has rarely been used by Asian sovereigns but is relatively common among Latin American and European issuers.

<sup>13</sup>: A particular problem may arise for bonds which are strippable (strips of government bonds are common in developed markets) because the stripped coupons and principals of new and old coupon bonds would not be fungible if their documentation differed.

<sup>14</sup>: Excluding Brady bonds, which do not include CACs even when governed by English law (in part because Brady deals were perceived at the time to represent a permanent exit from debt restructurings).

<sup>15</sup>: The US Trust Indenture Act 1939 prohibits clauses that could undermine an individual bondholder's rights to pursue their claims through the courts, but this applies to publicly issued corporate bonds, and not to sovereign bonds.

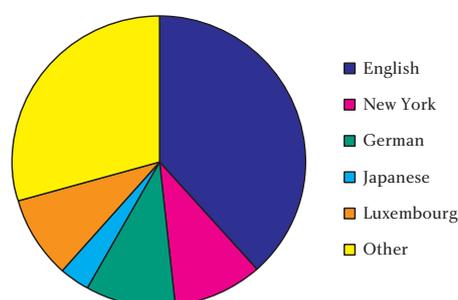
<sup>16</sup>: A statement by the German government in February this year (German Federal Government (2000)) indicated that German law does not preclude the use of CACs in international bond issues.

**Table 1: Governing law for international bond issues, 1990-2000**

	Total number	Percentage of bonds issued under governing law					
		English	New York	German	Japanese	Luxembourg	Other
All new issues	37,095	46.2	18.8	8.7	1.9	5.2	19.2
Sovereign issues	1,520	45.0	14.7	12.2	9.5	1.4	17.0
Emerging markets	625	30.6	27.5	19.4	13.1	1.9	7.5
Asia	63	31.7	36.5	1.6	27.0	0.0	3.2
Latin America	284	27.5	38.7	22.9	5.3	0.0	5.6
Europe / other	235	28.5	15.3	23.0	20.4	5.1	7.7

Source: Capital Data.

**Chart 1a: Governing law - stock of outstanding bonds (end-1990)**



Source: Capital Data.

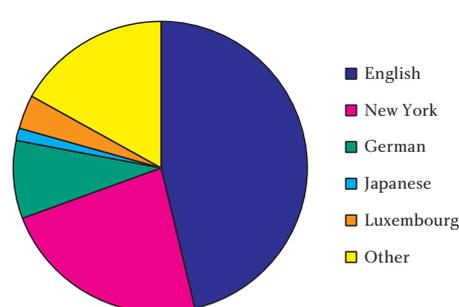
A comparison of the outstanding stock of all international bonds in 1990 and 2000 (see Charts 1a and 1b) shows that the proportions of outstanding bonds governed by English and New York laws have both increased. But the fall in issuance under Luxembourg law means that the proportion of bonds including CACs has only marginally increased.

CACs are already fairly widespread, but are still not included in around half of outstanding international bond issues. And, significantly, the proportion is much lower among EMEs, which are the countries where CACs might seem to have the greatest potential attraction.

### Price effects of CACs

The effect of the introduction of CACs on international bond prices is uncertain. CACs are likely to increase the expected recovery rate in the event of default – for example, by reducing the time to recovery via facilitating restructuring and reducing legal costs for creditors. *Ex ante*, this should provide an incentive for both creditors and debtors to have CACs. But it is argued that CACs make bonds

**Chart 1b: Governing law - stock of outstanding bonds (end-April 2000)**



Source: Capital Data.

easier to restructure and that therefore a sovereign might be more likely to default – a moral hazard argument. If this were the case, the market would charge a premium to compensate. Box 2 illustrates these two potential effects analytically and offers a few illustrative numerical examples.

Empirically, it is very difficult to disentangle the different effects. There has been only a handful of sovereign defaults on international bonds during the past century from which to infer default probabilities and recovery rates. Some suggestive evidence is, however, available from the effect of CACs on *aggregate* bond prices and yields. One simple approach is to look at a comparison of yields on pairs of bonds issued by the same sovereign in the same currency and with similar maturity and liquidity characteristics, but where one bond includes CACs and the other does not. The choice of governing law – English or New York – is generally used as a proxy.

Charts 2a-2f plot the yields on pairs of bonds issued under English and New York law for six countries.

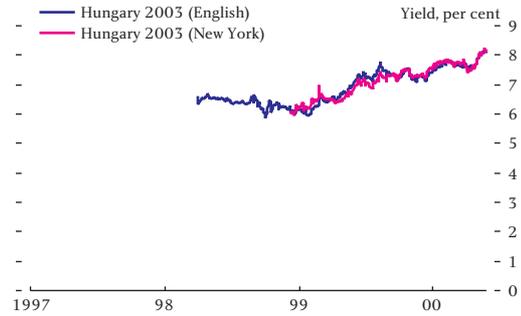
## Chart 2: Comparison of yields on bonds issued under English and New York law

Chart 2a:  
China



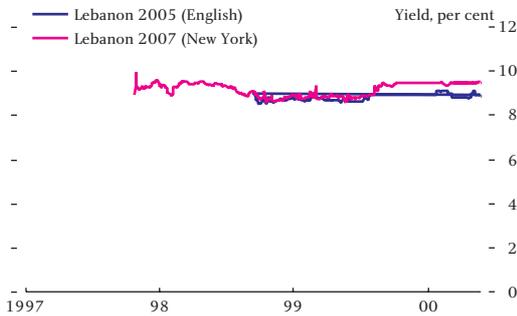
Sources: Bloomberg and Reuters.

Chart 2b:  
Hungary



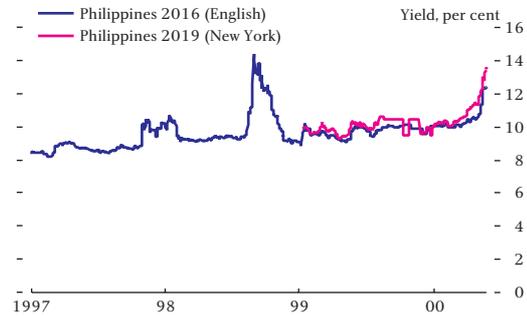
Sources: Bloomberg and Reuters.

Chart 2c:  
Lebanon



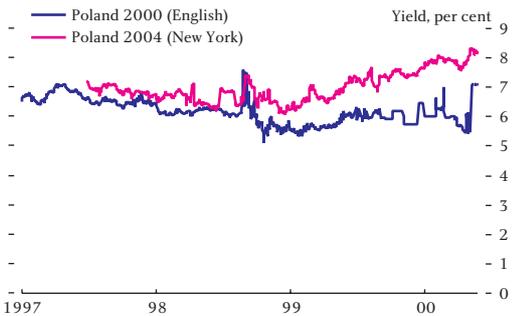
Sources: Bloomberg and Reuters.

Chart 2d:  
Philippines



Sources: Bloomberg and Reuters.

Chart 2e:  
Poland



Sources: Bloomberg and Reuters.

Chart 2f:  
Turkey



Sources: Bloomberg and Reuters.

For these countries, at least, it appears that the choice of governing law has not had any systematic effect on yields; if it exists at all, the CAC premium is almost always small and sometimes negative.

An econometric study from the BIS (1999) estimates the sensitivity of primary market bond spreads to governing law while controlling for other bond characteristics which might affect spreads. Although

their results suggest that, *ceteris paribus*, spreads on bonds issued under English law are around 40 basis points higher than those on bonds issued under New York law, the differences are not statistically significant<sup>17</sup>. The BIS conclude that the effect of CACs is not systematic and that other factors (eg the ability to trade the bond in the US) have a clearer effect on spreads than the governing law.

<sup>17</sup>: Petas and Rahman (1999) also conclude that CACs do not have a significant impact on bond prices.

Another recent study by Eichengreen and Mody (1999) reaches rather different conclusions. It looks at primary market yield spreads on international bonds issued by corporate and sovereign borrowers in developed and developing countries and the authors aim to control for such factors as credit rating, sectoral and regional effects, and market conditions. In addition, they take into account the possibility that the choice of governing law might be subject to adverse selection; that is, borrowers who believe that they might default in the future issue under English law in order to make the restructuring process easier.

The study suggests that the effect of CACs on yields depends on a borrower's credit rating. When the full sample of borrowers is considered, the effect of switching from New York to English law is negative but not statistically different from zero. But when the authors distinguish between borrowers of differing credit quality, the effects are statistically significant *and* behaviourally important for both investment and sub-investment grade debt. In a follow-up paper, Eichengreen and Mody estimate that, for borrowers with high credit ratings, including CACs may *reduce* spreads by up to 50 basis points<sup>18</sup>. By contrast, they suggest that CACs tend to *raise* spreads by around 150 basis points for the lowest quality credits. These results are, however, averaged across disparate groups of countries. And it seems implausible, for example, that the UK saved 50 basis points by including CACs in its euro Treasury note programme; there is certainly no evidence that this was the effect.

One way to interpret Eichengreen and Mody's results is to think of the two opposing effects of CACs on bond prices. More orderly restructuring might be expected to lower loss given default (increase the recovery rate) irrespective of a borrower's rating, so should tend to reduce borrowing costs for all borrowers. Any such effect is likely to be greater for lower-rated credits because of their higher default probability. Against this, CACs may affect borrowers' incentives to default differently depending on their credit quality. For more creditworthy borrowers, who regularly access international capital markets, the presence of CACs is unlikely materially to affect their

decision to default. But the moral hazard problem may be greater for lower-rated, infrequent international borrowers. If the consequent increase in default probability is perceived to outweigh the benefits of increased recovery, the market will charge a premium to compensate. But to the extent that EMEs have become more frequent (and repeat) borrowers in international markets, any increased incentive to default is probably weakened.

It is also possible that CACs could have different yield effects for sovereign and corporate borrowers. The beneficial effect of the prospect of more orderly debt workouts may be greater for sovereigns because domestic bankruptcy laws, which can facilitate corporate restructurings, cannot be applied to them. If sovereign borrowers enjoy sovereign immunity, however, the moral hazard problems caused by CACs may also be greater. Eichengreen and Mody calculate that there is no significant difference in the CAC yield premium between sovereigns and other borrowers. This may reflect the fact that domestic bankruptcy procedures in some EMEs are not well defined or strong enough to guard against disorderly debt workout procedures in corporate cases<sup>19</sup>.

This empirical evidence is clearly not definitive; and several caveats apply. For example, while much of the evidence suggests that CACs do not have a statistically significant impact on bond prices, the evidence is drawn from a period when the market may have been less sensitised to the inclusion of CACs, perhaps because of the low incidence of sovereign bond default. Recent experience of sovereign default in Ecuador, Pakistan and Ukraine may have shifted those perceptions, although initial indications (Charts 2a-2f) are that relative yields between bonds with and without CACs have not been affected materially. While the Eichengreen and Mody study suggests that CACs could have a material impact on bond prices and markedly push up the cost of borrowing for lower quality borrowers, the numerical example in Box 2 suggests that the perceived moral hazard effect of CACs would have to be sizeable to cause such a large effect on bond yield spreads in practice. That does not seem likely for an EME aiming to integrate into global capital

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<sup>18</sup>: Eichengreen and Mody (2000). The impact on spreads is calculated as an average for each category.

<sup>19</sup>: This has been found to be the case recently in some east Asian countries where the weakness of judicial systems has undermined the efficiency of bankruptcy courts (Claessens, Djankov and Klingebiel (1999)).

## Box 2: The effect of CACs on bond prices and yields

If investors are risk neutral, the *yield* on a single period risky (zero coupon) bond,  $y$ , may be calculated by assuming that its *expected* return is equal to the risk-free rate,  $r$ :

$$E(R) = (1 + r) = (1 - \pi)(1 + y) + \pi.\delta(1 + y) \quad (1)$$

$$y = \frac{r + \pi(1 - \delta)}{1 - \pi(1 - \delta)}$$

where  $\pi$  is the cumulative probability of default over the lifetime of the bond and  $\delta$  is the (expected) recovery rate in the event of a default defined as a fraction of the face value of the bond.

Similarly, the *price* of the risky bond,  $p^*$ , can be expressed in terms of the price,  $p$ , of an equivalent risk-free bond (such as a US Treasury):

$$p^* = p(1 - \pi) + p.\pi.\delta \quad (2)$$

$$= p[1 - \pi(1 - \delta)]$$

This simple pricing equation can be used to illustrate the ambiguous effect of CACs on bond prices. Take the base case to be a single period sovereign bond without CACs (one governed by New York law). Define its price to be  $p_1^*$  as in Equation 2. Now assume there is a bond with CACs (issued under English law) but which is otherwise identical. If the increase in the default probability in the English bond is denoted by  $\Delta\pi$ , and the increase in the recovery rate by  $\Delta\delta$ , then the price of this bond,  $p_2^*$  is given by:

$$p_2^* = p[1 - (\pi + \Delta\pi)(1 - (\delta + \Delta\delta))] \quad (3)$$

$$= p_1^* + p[\pi.\Delta\delta - \Delta\pi(1 - \delta) + \Delta\pi.\Delta\delta]$$

If  $\Delta\pi$  and  $\Delta\delta$  are both fairly small (so that terms in  $\Delta\pi.\Delta\delta$  may be disregarded), then the condition for there to be a positive effect on price when a CAC is included in a bond contract is approximately:

$$\frac{\Delta\pi}{\pi} < \frac{\Delta\delta}{(1 - \delta)} \quad (4)$$

That is, the (proportional) increase in default probability caused by the inclusion of CACs needs to be smaller than the increase in the expected recovery rate.

These effects can be illustrated numerically.

### Numerical example

Consider a one-year bond issued under New York law with a default probability,  $\pi$ , of 20 per cent, and expected recovery of 40 per cent of face value (ie  $\delta = 0.4$ ). Let the risk-free rate,  $r$ , be 5 per cent. The bond will trade at a price of US\$83.81 (from Equation 2) – a yield of 19.3 per cent (Equation 1) – compared with a price of US\$95.24 for an equivalent risk-free bond.

Now consider an identical bond issued under English law. Assume that the presence of CACs means that, if the bond defaults, the workout time will be a year shorter than if there were no CACs. Because the recovery is received a year earlier, its net present value increases by  $1+r$  to 42 per cent of face ( $\Delta\delta=0.02$ )<sup>(a)</sup>.

If the change in governing law did not affect the default probability (so  $\Delta\pi=0$ ), the price of the bond would increase to US\$84.19 and its yield would fall to 18.8 per cent. This reduction in yield of 50 basis points is broadly comparable with Eichengreen and Mody's findings for more creditworthy borrowers (although a borrower with a default probability of 20 per cent could hardly be regarded as creditworthy).

If the introduction of CACs did lead to an increase in default probability, the price of the bond issued under English law would still be higher than that issued under New York law provided that:

$$\Delta\pi < \frac{\pi.\Delta\delta}{(1 - \delta)}$$

$$< 0.007$$

That is, so long as the default probability increases to no higher than 20.7 per cent.

For lower-rated credits, Eichengreen and Mody found a rise in yields of around 150 basis points. In this example the yield would increase from 19.3 per cent to 20.8 per cent. Rearranging Equation 1, this implies that the change in default probability would be:

$$\pi + \Delta\pi = \frac{y - r}{(1 + y)(1 - (\delta + \Delta\delta))} = 0.226$$

$$\Delta\pi = 0.026$$

For there to be a 150 basis-point increase in the yield, the inclusion of CACs would have to cause the default probability to increase by over two percentage points (more than 10 per cent) to 22.6 per cent.

(a): This assumes that the recovery rate is known with certainty, and therefore can be discounted at the risk-free rate.

markets, although it might apply to a greater extent to less frequent, low-rated borrowers.

### Recent experience with CACs

There has been some useful recent experience in introducing CACs into bond documentation (by both the sovereign and private sectors) and in using CACs in the course of bond restructuring. In general, this evidence tends to support the view that CACs are unlikely to have a material impact on bond pricing; that awareness of the CAC issue is growing; and that CACs can bring more order to the bond restructuring process.

#### (a) Introducing CACs

Among sovereign borrowers, the United Kingdom has included provisions for note holder meetings and majority voting (of 75 per cent) in its US dollar issues since 1992. Since January 2000, these provisions have also been included in the UK euro Treasury note programme. The latter move was a deliberate attempt by the UK authorities 'to encourage other countries, especially the emerging markets, to include similar provisions in their own foreign currency bond issues'<sup>20</sup>. There is no evidence that the inclusion of CACs has been a significant factor influencing the holding or price of the euro notes.

Canada announced in April that it too would include CACs in future international bond and note issues, in an effort to encourage wider use of these clauses. Canada's euro medium-term note (EMTN) programme has been amended to include majority action, collective representation and non-acceleration clauses, although no foreign currency bonds have yet been issued under this programme. Canada has

indicated that similar clauses will be incorporated into its other foreign currency note programme (the Canada Notes programme) and any future global bond issues.

#### (b) Private sector views

Table 2 summarises the views of some representative bodies within the private sector. The International Primary Market Association (IPMA) Executive Committee supports the appointment of trustees and inclusion of CACs, albeit with a high threshold and quorum for qualified majority voting, and has begun a dialogue with its membership on the merits of including CACs in the standard terms of issue. If a consensus emerges among the membership, these provisions may be included in the list of non-commercial terms to be disclosed when a new issue is launched. This would be a positive step towards promoting CACs as best market practice. But there appears to be greater opposition to majority voting in the New York market. These issues were discussed at a roundtable meeting of official and market practitioners, arranged by IPMA and the G10 and held at the Bank of England in February 2000.

#### (c) Have CACs been useful in practice?

Pakistan restructured its international bonds in December 1999, using a voluntary exchange offer as the most 'market friendly' approach available. It chose not to invoke the CACs present in its bonds on the grounds that this would have been difficult in the short time available<sup>21</sup> and there was also judged to be a risk that a bondholders' meeting could have provided a forum for creditors opposed to the

**Table 2: Private sector associations' views on CACs**

International Institute of Finance (IIF)	International Primary Market Association (IPMA)	Emerging Market Traders Association (EMTA)
Some borrowers may wish to incorporate qualified rescheduling clauses, but attempts to make them mandatory are counterproductive. Potentially fruitful area for public-private sector co-operation.	Support inclusion of majority voting provisions with a high threshold (eg 90 per cent), but the minimum quorum for an adjourned meeting should be well above 25 per cent to eliminate the potential for a minority to impose their wishes on the majority.	Initiative must not undermine legal responsibility of debtors. Sharing clauses threaten the legal right of creditors to enforce their claims. Majority voting of 90-95 per cent would be acceptable, but voluntary exchange offers are preferable.

Source: IIF, IPMA, EMTA (bilateral correspondence with Bank of England)

<sup>20</sup>: HMT press release, 11 January 2000.

<sup>21</sup>: In between Pakistan's new military government coming to power in October 1999 and a December 1999 deadline to meet Paris Club requirements.

exchange to organise a hostile response. Nevertheless, anecdotal evidence suggests that the backdrop provided by the bonds' CACs and the presence of a trustee may have been helpful in dissuading creditors from litigation.

Ukraine made use of the CACs contained in four of its five debt instruments, in an exchange offer that was concluded in April 2000. A condition of accepting the exchange was for holders of these bonds to give their votes to an exchange agent who would act as their proxy at a bondholders' meeting, and thereby bind in any non-participating holders (providing the requisite thresholds were reached). The CACs are thought to have contributed to achieving over 98 per cent acceptance by the cut-off date for exchange.

Since defaulting in October 1999, Ecuador – whose bonds do not have CACs – has made little progress in reaching agreement on a restructuring. It is likely, however, that political and economic issues, rather than the absence of CACs, have been the key factors.

## Conclusion

Opinion seems to be growing that the inclusion of collective action clauses in bond contracts may be useful in streamlining crisis resolution procedures. These clauses can help to address the collective action problems that can arise during bond restructurings and so make a contribution to facilitating orderly debt workouts. Most of the empirical evidence suggests that the countervailing costs are not significant, including the cost of borrowing. And recent experience suggests that CACs may have played a useful role during some EME debt restructurings. Recent moves by the official and private sectors to encourage the wider inclusion of CACs in bond issues are therefore encouraging; but there is a good deal further to go.

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