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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**

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The financial stability conjuncture and outlook

This article reviews recent and possible future developments relevant to financial stability. It considers disturbances since the beginning of 1999, the after-effects of earlier shocks, and whether any new risks can be identified. Shocks to the world financial system can come in many different forms: problems in a debtor country or group of countries, in a significant firm or group of firms, or in the functioning of markets, including the trading and settlements infrastructure. The knock-on effects of a shock depend on the overall condition — robustness or fragility — of the system. That will be affected by a range of factors, including the extent of leverage in the financial, corporate and household sectors; the distribution of exposures amongst financial institutions; the adequacy of risk management; and the strength of capital resources. Those issues are also, therefore, touched on where relevant. The focus throughout is on broad sectors and classes of risk, not on the position of individual firms; and is not just on likely developments but also on the small risks of especially costly disruptions. The Bank plans to update this review in future issues of the *Financial Stability Review*.

THIS SURVEY, covering events up to end-May 1999, starts with the external environment and in particular (in section I) with the disturbances in emerging-market economies which have been a major factor behind the recent fragility in financial markets and systems. The developed economies (principally the G10 industrialised countries) and their financial markets, including risks from global imbalances, are surveyed in section II. Sections III and IV cover the UK economy and financial system, paying particular attention to banking because of its unique role in the monetary system via maturity transformation, credit creation, and the payments and settlements systems. The resilience of the financial system, and thus the impact and cost of shocks, is affected — here and overseas — by the financial infrastructure, regulatory systems, and the international architecture. Material developments in these areas are summarised in section V.

I Emerging-market economies

Financial crises — in developed and developing economies — have in the past been precipitated by a wide range of economic shocks, and it is difficult to identify leading indicators which reliably signal a heightened risk of financial instability. Three factors that seem to have been associated with increased risk in emerging-market economies (EMEs) are: unexpectedly sharp changes in macroeconomic conditions; imprudent debt structures; and rapid changes in the framework within which financial companies operate. Large macroeconomic shocks can reduce the ability of debtors to repay loans by more than allowed for in creditors' pricing of credit risk. Even when macroeconomic policies are otherwise robust, the overall debt structure of an economy — taking the government sector, banking system, and non-bank private sector together — can make a country vulnerable to self-fulfilling crises, including contagion from problems elsewhere, although the degree of vulnerability depends to some extent on its exchange-rate regime[1]. Financial liberalisation, when not accompanied by enhanced risk-management practices and strengthened prudential regulation, has often led to a country's financial system, and sometimes its personal and corporate sectors, becoming over-extended as firms adapt to their new environment. All these factors seem to have been at work in the recent crises in East Asia and Latin America[2].

These crises also served as a reminder of the ways in which financial problems in emerging-market economies can affect the financial systems of major industrialised economies. Arrears and losses on lending to Latin America and eastern Europe were a serious problem in the 1980s.

Box 1 The Bank's financial stability role

Under the terms of the 1997 Memorandum of Understanding with HM Treasury and the Financial Services Authority, the Bank is responsible for the "overall stability of the financial system as a whole"[1]. To pursue that responsibility effectively, the Bank needs, among other things, to make periodic assessments of any potential risks to stability.

Stability is necessary for the financial system to perform its key functions effectively — including the provision of a secure means of holding monetary and other financial assets, the payment and settlement of financial and other claims, and the efficient allocation of savings amongst competing investments. This entails the financial sector as a whole being sound, with confidence in its ability to meet its obligations; but it does not mean that no individual firm should ever fail. It also requires financial markets in which participants can transact at prices that reflect fundamental forces and that do not vary substantially over short periods in the absence of changes in fundamental factors.[2] At the opposite end of the spectrum is a systemic financial crisis, which has been defined as "a disturbance that severely impairs the working of the financial system and, at the extreme, causes a complete breakdown in it"[3].

The Bank is particularly interested in financial disturbances which might impose significant economic costs, and/or where intervention by the authorities to stabilise the system may need to be considered. It therefore needs to assess the likelihood of systemic financial problems, and how crises may occur, taking account of the complex interlinkages in modern financial systems and markets[4]. Such assessments inform the Bank's priorities for taking or promoting measures to make the system more robust, alone or in concert with other central banks, regulatory agencies, governments, infrastructure providers and market participants. They may lead the Bank to identify and analyse incipient threats to financial stability, if possible in time for preventative or containing measures to be taken by firms, households and regulatory or other agencies. Transparency could potentially be valuable in this field, as it is in monetary policy. There are, though, limits to the degree of openness that is realistic — the Bank must avoid the financial equivalent of shouting "fire!" in a crowded theatre. The hope is that being as clear as possible about the Bank's developing analysis and assessments might contribute to other efforts to promote a robust environment. But some shocks to the system have not been anticipated in the past, and that will inevitably continue to be so.

Notes

1 The Memorandum of Understanding is set out as an annex to the article on the Bank of England Act 1998 in the Bank of England *Quarterly Bulletin*, May 1998, pp93-99.

2 An analysis along these lines is set out by Andrew Crockett, General Manager of the BIS, in "Why is Financial Stability a Goal of Public Policy?" Federal Reserve Bank of Kansas City Symposium: "Maintaining Financial Stability in a Global Economy" (1997).

3 Euro-Currency Standing Committee, now the Committee on the Global Financial System, which reports to the G10 central bank Governors. ECSC (1992): "Recent Developments in International Interbank Relations".

4 Michael, I (1998): Financial Interlinkages and Systemic Risk, *Financial Stability Review*, No.3, Spring, pp26-33.

Mexico's crisis in 1994/95 heralded a recurrence of major problems in EMEs. The more recent EME currency crises and banking problems have also caused significant losses to some G10 financial institutions and, as discussed below, have reduced or reversed capital flows. The direct exposure of the UK financial system has, however, been relatively limited (see Table 1). According to Bank of England data, lending from a group of the major British banks[3] to emerging-market economies[4] was £25.5bn as of December 1998. That accounted for just over 11 per cent of the cross-border claims of this group and 2.6 per cent of their total assets; and was the equivalent of just over 45 per cent of regulatory capital in December 1998. That compares with

Table 1: International exposures of UK-owned banks[a]

	US$bn			Percentage change	
	Dec 96	Dec 97	Dec 98	Dec 96 to Dec 98	Dec 97 to Dec 98
Total external claims	443	625	629	42%	1%
BIS reporting area	324	448	463	43%	3%
Total European area	144	180	247	71%	37%
Other developed countries	29	52	44	49%	-16%
Offshore banking centres	33	46	42	28%	-9%
Developing economies	51	66	66	29%	1%
Middle East & Africa	9	10	11	25%	15%
Emerging market regions	42	56	55	30%	-2%
Eastern Europe	-	3	3	-	-1%
Latin America	16	21	24	49%	12%
Asia	26	32	29	8%	-11%
Five IMF programme countries	19	27	24	25%	-10%
Russia	-	1.0	1.0	-	3%
Brazil	4.2	9.3	9.5	124%	2%
Thailand	4.2	3.7	2.8	-33%	-24%
Indonesia	3.0	3.6	2.8	-7%	-22%
South Korea	7.5	9.1	7.7	3%	-15%
Others					
China	5.4	7.2	5.9	9%	-18%
Hong Kong	14.8	22.4	19.8	34%	-11%
Japan	54.3	84.9	56.8	5%	-33%

(a) Data are adjusted for risk transfer, with the exception of Russian data. Risk transfer adjustment means the data account not just for the country of contractual exposure but also for the country of ultimate liability. In this way these data adjust for on-lending, eg from Hong Kong to China.

Source: Bank of England

EME exposures of 4.1 per cent of total assets and around 65 per cent of regulatory capital in the late 1980s.

Looking at banking exposures to EMEs from a broader base of lending countries, Chart 1 shows lending from banks owned or operated within the BIS area[5]. The chart highlights the rapid increase of bank lending from the early 1990s until 1997. The increase is dominated by lending to Asia, although lending to Latin America and Eastern Europe also increased during the period. But in 1998, bank lending fell substantially; in H2 1998, the stock of bank lending to developing Asia was 21 per cent lower than a year earlier, whereas for Latin America and Eastern Europe it was 2 per cent and 9 per cent lower respectively. German and Japanese-owned banks are the biggest lenders to EMEs supplying 19 per cent and 13 per cent of the stock of BIS-area bank lending as at December 1998; UK-owned banks accounted for around 9 per cent. One of the significant trends has been the fall in the share of total BIS lending attributable to Japanese-owned banks since H1 1997. That is partly explained by the problems within their domestic banking system. Also, in 1998, the contraction was affected by the financial crisis in Asia, as lending to developing Asia accounted for around 80 per cent of Japanese-owned banks' lending to EMEs.

Brazil and Latin America

The most significant shock to stability from emerging-market economies so far in 1999 occurred at the beginning of the year, when the Brazilian government was forced to float the *real* on 18 January. The Box on Brazil reviews developments there over the past nine months. The main risks to financial stability were the possibility of an interruption of Brazilian debt service, and that departure from the crawling-peg exchange-rate policy might bring the sustainability of other pegged exchange-rate regimes into question. That might in turn have triggered a wider reassessment of the sustainability of current IMF programmes. As the Box describes, implementation of a new economic programme, agreed with the IMF, has so far helped to stabilise conditions in Brazil itself, although, as the authorities recognise, there remain major challenges for fiscal and monetary policy, including establishing a credible nominal anchor[6]. In addition, and despite recent successful attempts to extend debt maturities and sell at fixed rates of interest, a high proportion of Brazil's debt remains of short maturity and tied to short-term interest rates. This means that debt-servicing costs remain sensitive to external shocks and changes in market sentiment.

The immediate impact of the Brazilian devaluation on other countries and markets was in the event limited. Brazil's

Box 2 The Brazilian crisis

Between June and November 1998, Brazilian reserves fell by US$29.7bn, as domestic investors moved capital abroad and foreign investors became increasingly reluctant to maintain exposures. In the wake of the capital outflows, Finance Minister Malan of Brazil formally asked for IMF assistance on 13 November.

In 1997, Brazilian GDP was US$773bn, the eighth largest in the world. However, the Brazilian economy is relatively closed, reducing the threat to world trade: Brazilian imports accounted for just one per cent of world trade in 1997. But the Brazilian crisis posed a direct threat to the financial system in the industrialised economies as the risk of default rose. UK banking exposure to Brazil was US$9.5bn at the end of December 1998 (after adjustment for risk transfers). That was large relative to most other emerging economies, but was only a small part of UK banks' total international exposure (around US$629bn on the same basis).

While the direct implications of the Brazilian crisis were smaller than might have been expected given the economy's size, the scope for indirect effects via spillovers to other emerging markets magnified the importance of the crisis. 21.9 per cent of Brazilian imports were from Latin America in 1997, so economies in that region faced a more significant trade shock. The other three members of MERCOSUR (Argentina, Paraguay, and Uruguay) account for 15.7 per cent of Brazilian imports.

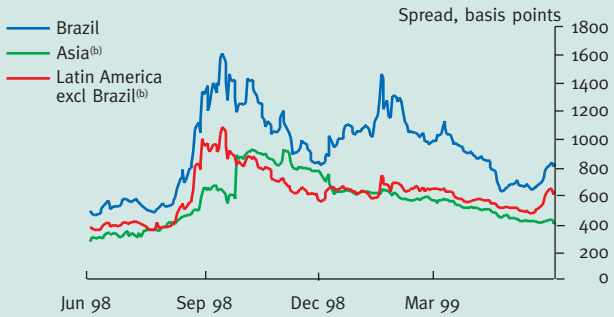
Trade exposures are not, however, the main source of contagion. Recent financial crises have been characterised by increases in borrowing costs throughout the emerging markets. Investors became less content with the level of risk in these markets, or they reassessed those risks, or they demanded compensation for the lesser liquidity of emerging markets. Whichever the most important explanation, co-movements in borrowing costs are a potentially important means of contagion. Chart 1 plots spreads on sovereign borrowing costs relative to US Treasuries. Latin American spreads widened at the start of the Brazilian crisis, but have subsequently narrowed somewhat. In Asia, spreads were not affected much at first, but rose later.

The birth of a crisis

Brazil has a history of economic instability. Between 1989 and 1994, Brazilian inflation averaged 1806 per cent annually — prices increased by almost one million times over those five years. The adoption of the Real Plan in 1994 was intended to halt inflation. The exchange rate was to be targeted, a tight monetary policy run and wage indexation ended. This policy was successful in reducing inflation, which fell to just 3.8 per cent in 1998. However, the government could no longer finance a significant structural deficit by printing money. Under the Real Plan, excess government spending was reflected in a primary deficit and mounting government debt.

The level of Brazilian government debt was not high by industrial-country standards — Brazil would have met the Maastricht debt criterion. However, Brazilian debt paid a high interest rate — a legacy of past instability — so that debt servicing was costly. And the structure of the debt left Brazilian financing exposed to shocks. In September 1998 a large part (around 44 per cent) of the debt paid floating interest rates, so that debt-servicing costs would rise with interest rates. And the debt had a short average maturity (around seven months, compared with around seven years in the UK), so that a large part of the debt needed to be refinanced each month.

Chart 1: Emerging markets' sovereign bond spreads[a]



(a) calculated as emerging market country bond yields over maturity matched US treasury bonds.

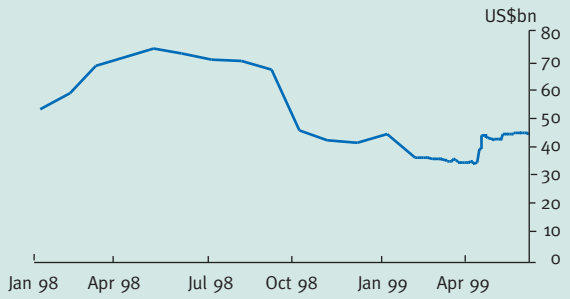
(b) GDP weighted.

Sources: Bloomberg and Bank of England.

As confidence in the Brazilian government's ability to service its debt fell, capital outflows increased and reserves fell sharply (see Chart 2), despite a 20 percentage point rise in interest rates. The collapse in confidence was self-fulfilling, as the increase in borrowing costs and capital outflows made it harder for the Brazilian government to service its debt, which in turn reduced the willingness of investors to lend.

It is hard to pin down the exact cause of the loss of

Chart 2: Brazilian reserves



Source: Banco Central do Brasil.

confidence, but it is likely to have been a combination of investors revising their views about the risks attached to emerging-market loans in general (in the wake of the Russian and Asian crises); concerns about the vulnerability of Brazilian debt dynamics to changes in interest rates and the availability of credit; and a reduction in their appetite for risk.

The first IMF package

On 13 November 1998, the IMF announced a loan package to provide temporary liquidity to the Brazilian authorities. Details of the proposal had been in the markets before the loan was approved, and it was widely expected to be passed. This expectation had helped stem capital outflows throughout November.

The IMF loan was a part of a US$41bn package put together by a range of multilateral organisations. The lending was staggered, with some US$9bn of IMF assistance available immediately. The IMF programme set out detailed projections for Brazilian debt dynamics. These suggested that — if confidence returned — debt would stabilise without the need to draw down any of the loan package.

The package was also designed to offer a breathing space while the more fundamental causes of the financing crisis could be addressed. The Brazilian government agreed to accelerate their fiscal reforms, with a target primary surplus of 2.6 per cent in 1999. Monetary policy would continue to target the exchange rate, as that provided an anchor to hold inflation down.

Prelude to the second package

At first, the response to the IMF package and associated reforms was positive. The spread paid on Brazilian sovereign dollar debt fell (Chart 1), interest rates were cut, and capital outflows became smaller (Chart 2). However, the continuation of some capital outflows meant that the buffer offered by the IMF package was being eroded. Towards the end of 1998 and in early January 1999, confidence was affected by bad news — some fiscal reforms were delayed, and, on 6 January, the Governor of Minas Gerais announced that his state might not service its debt. Although the Federal government quickly promised to cover any shortfall, confidence in the programme was hit. Capital outflows increased, in expectation of a future devaluation. Interest rates were not raised but, at about 30 per cent, they remained well above interest rates in other economies with similar rates of inflation. Brazilian monetary policy suffered from a one-way bet. In the event, the Brazilian exchange rate did depreciate — first as the target band was widened and subsequently (after 18 January) as the exchange rate was formally floated.

The second IMF package

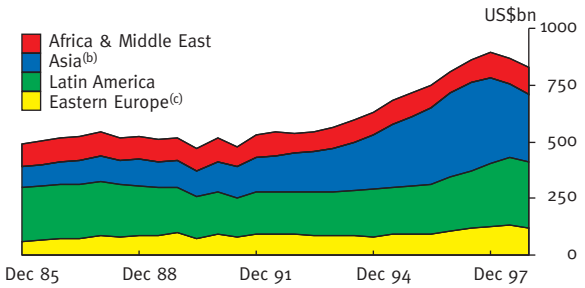
Floating the exchange rate removed the pressure on reserves from capital outflows, but it raised new challenges. First, the depreciation raised the cost of servicing Brazil's external debt. Second, it removed the nominal anchor that held inflation down. The latest IMF package (announced on 30 March 1999) modifies the first in the light of these new challenges. To cover the increased cost of servicing foreign-currency debt, the target primary surplus has been increased to 3.1 per cent of GDP in 1999 and 3.25 per cent in 2000. To provide a nominal anchor, the Brazilian authorities are designing an inflation target, and in the meantime will target the money supply. Finally, the Brazilian authorities have sought and received assurances from a number of foreign banks that they will maintain their credit lines to Brazil.

There are nevertheless risks to the programme. It does not envisage replacing private money with public funds, because that would provide an incentive to make risky loans in the future. Maintenance of confidence is vital, as otherwise private capital will flow out of Brazil and investors will be reluctant to lend.

The evidence so far is favourable. The dollar exchange rate appreciated to 1.73 (28 May) from its low of 2.20 on 3 March. Nominal interest rates have been cut from a peak of 45 per cent to just under 23.5 per cent by 28 May. Equity prices increased by 11.7 per cent between the public announcement of the new programme on 8 March and 28 May, and some Brazilian firms have regained access to international capital markets. However, the recent crises have shown how rapidly confidence can reverse.

problems did not have much effect on market interest rates, including credit spreads, in those industrialised countries whose banking systems were most exposed (for example, Spain and Portugal).

Chart 1: Stock of bank lending to emerging-market regions[a]



(a) These non-risk-transfer adjusted data (including affiliates and branches) cover all lending by BIS-area owned banks and lending by banks operating within the BIS area but with their head offices outside BIS area.

(b) Asia excludes Hong Kong and Singapore.

(c) Includes Russia.

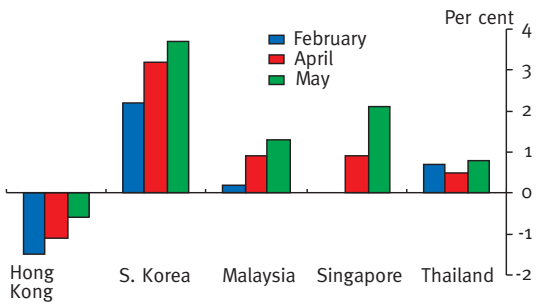
Source: BIS.

In Argentina, spreads between domestic-currency and dollar interest rates widened sharply around the time of the Brazilian devaluation but subsequently fell back, suggesting reduced market fears of contagion. They have, however, recently widened a little following the "bias to tighten" decision of the Federal Reserve on 18 May and indicators of a weakening domestic economy. That could affect the fiscal outlook.

In Mexico, financial markets seem largely to have recovered from the shock of the Brazilian crisis. The direct economic links between Brazil and Mexico are small. Some reform of the financial sector is underway. Legislation has been passed to help recapitalise the banking sector and improve its operations, but there remains evidence of weakness, notably a significant amount of problem loans. The rise in the price of oil this year should help, so long as it is sustained.

The relatively limited immediate impact of Brazil's problems in global markets may have been attributable in part to a reduction in external exposures to emerging-market economies, and perhaps to reduced leverage more generally, prompted by the earlier difficulties in east Asia and Russia. Sharp price adjustments in many markets were triggered by the suspension of debt payments by Russia last summer, and the emergence shortly afterwards of problems at the hedge fund LTCM. Up to that point, market participants, possibly reacting to the international support given to Mexico in 1994, may have conducted business on an assumption that a major — and especially a strategically important — country experiencing debt-financing difficulties would be bailed out. Recent crises may have encouraged lenders to exercise better due diligence in assessing investment opportunities, and to reassess the probability of their being bailed out if sovereign exposures go bad. As described in the accompanying article on the "international financial architecture", the official international community is promoting debate on how best to involve private-sector lenders in crisis prevention and resolution.

Chart 2: GDP growth: consensus forecasts for 1999, selected Asian economies



Source: Consensus Forecasts.

East Asia

The economies and financial sectors of the crisis-affected Asian countries have recovered during 1999, but remain fragile. Looking forward, a balance needs to be struck between maintaining a reasonable level of aggregate

demand, implementing effective restructuring and recapitalisation of the financial and corporate sectors, and ensuring the longer-term soundness of public finances. The situation has been complicated by political unrest in some countries, particularly Indonesia.

Overall, prospects for economic growth have improved (for example, see Chart 2). The Asian Development Bank recently forecast GDP growth of 4.4 per cent for the region[7] in 1999, compared to 2.6 per cent in 1998. The upwards revision has been most marked in Korea, which recorded 4.6 per cent growth in the first quarter of 1999. Better growth figures have been accompanied by a recovery in asset prices and capital inflows. Equity prices have typically risen by around 30 per cent this year in the Asian crisis countries; and the spreads on long-term dollar debt are not much above their levels before the crisis. Current-account surpluses and increased confidence due to financial-market developments have helped the authorities to lower interest rates to support growth.

The worries that re-emerged in Asia immediately following the Brazilian depreciation in January quickly receded. For example, the forward discount on the Hong Kong dollar returned to a level only slightly above levels before the Brazilian devaluation. Exchange rates, mostly now floating, have generally strengthened since the middle of 1998. Against this generally improved background, Malaysia replaced its one-year embargo on capital repatriation with an exit tax (effective from 15 February), graduated in such a way as to discourage sudden capital outflows.

The problems in the financial sectors of the Asian-crisis countries, however, remain large. For example, Deutsche Bank's[8] most recent estimate of the level of non-performing loans was 82 per cent of total loans in Indonesia, 30 per cent in South Korea and Malaysia and 67 per cent in Thailand. Their estimates of the associated losses (as a percentage of GDP) were of the order of 60 per cent in Indonesia and Thailand and just over 15 per cent in South Korea and Malaysia. The bulk of these losses seem likely to fall to the governments.

Restructuring is underway in all the crisis countries, albeit in different ways and at differing speeds. Indonesia's financial and corporate-sector problems are compounded by high levels of public debt, constraining the degree of government finance available to help resolve the problems. Korea also has significant problems in both sectors, but a much smaller public debt burden. The problems in Thailand and Malaysia are more concentrated in real estate and stock markets than in the other countries.

There are major differences in the approaches to financial restructuring. Compared with Thailand, Korea and Malaysia seem to have taken a more interventionist approach, at the outset hiving off non-performing loans to loan-recovery agencies and thus transferring the financial burden of cleaning up the banks' balance sheets to the taxpayer. The extent of Thai government assistance has been more limited, with the onus on the institutions themselves. Indonesia has only recently begun to make progress on bank restructuring and recapitalisation; the closure of thirty eight private banks was announced on 13 March 1999.

Progress with corporate restructuring has been somewhat slower throughout the region. The process has been hindered by the lack of well-developed domestic capital markets, shortcomings in corporate governance, inadequate insolvency frameworks and, in some countries, apparent inconsistencies in court judgments.

The process should become less difficult if, as forecast, growth resumes in 1999. Nevertheless, there is a risk that the improved outlook could reduce the incentives to carry out thoroughgoing reform. If effective restructuring is not carried through, the financial systems and corporate sectors of east Asia could remain fragile.

China

China maintained a rapid growth rate during 1998, despite the Asian crisis. It did so on the back of expansionary monetary and fiscal policies, helped by capital controls and the size of its foreign-currency reserves. Faced with the risk of slowing growth during 1999 and speculation about a possible devaluation of the *yuan*, both the Premier, Zhu Rongji, and the Governor of the Central Bank, Dai Xianglong, reaffirmed their commitment to the existing parity for the year ahead.

Official data recorded a sharp fall in the trade surplus in the first four months of the year compared with the same period in 1998. Inward foreign direct investment was 12.6 per cent lower. Retail prices fell 3.5 per cent in the twelve months to April 1999. Although industrial output has continued to grow strongly, indeed at rates above the official target for GDP growth for the year of 7 per cent, this seems to have been sustained largely by public-sector infrastructure spending.

International creditors have been exposed to other risks, exemplified by the uncertainty about how external debt would be treated when one of China's investment vehicles, GITIC[9], went bankrupt early this year. Premier Zhu has urged foreign firms to explore restructuring before filing

bankruptcy proceedings against Chinese firms. A test case will be the outcome of the current restructuring efforts for Guangdong Enterprises. A lengthy and difficult transition period seems likely, in particular for China's financial institutions and its state-owned enterprises. Again, a delicate balance needs to be struck between reform of these entities on the one hand, and sustaining domestic demand on the other.

Russia

A new IMF programme has recently been proposed for Russia, which emphasises again the need for corporate and financial restructuring and tax reform. The rise in commodity, and particularly oil, prices this year may help, but short-term prospects (at least) are poor. There has already been a significant fall in output and a sharp increase in inflation since August last year; and the country's financial markets are still not functioning effectively. Last year's crisis in Russia caused sizeable losses for some UK banks. But it also prompted apparently sharp reductions in exposures, which should limit any direct threat from continuing problems. Russia has asked the London Club of commercial-bank creditors for a six-month rollover of Soviet era obligations which fell due on 2 June. Russia is due to make repayments to the IMF of US$4.5bn this year.

Commodity prices

Commodity prices are important for many EMEs, either as exporters or importers. For example, China, Brazil, and Korea are big oil importers. In addition to the Middle Eastern and African oil exporters, Colombia, Ecuador, Indonesia and Venezuela all rely on oil for over 20 per cent of their exports. Commodities account for over 50 per cent of exports in all the major Latin American economies except Brazil and Mexico. Commodities represent less than 50 per cent of exports in all the major Asian and Eastern European economies.

After sharp falls last year, there has been some recovery in commodity prices so far in 1999. Crude oil prices fell by around 30 per cent in 1998, which imposed considerable strain on oil exporters. They have risen by 40 per cent this year, although they are still around 20 per cent below their average in 1997. Commodity exporters in general suffered adverse shocks to their terms of trade, with knock-on effects on their currencies. Amongst metals, the price of aluminium fell by 16 per cent and nickel by around 30 per cent in 1998. In the first five months of 1999 these metal prices have risen. Of course, a rise in commodity prices represents a negative supply shock to commodity importers.

Table 2: Emerging-market net external financing

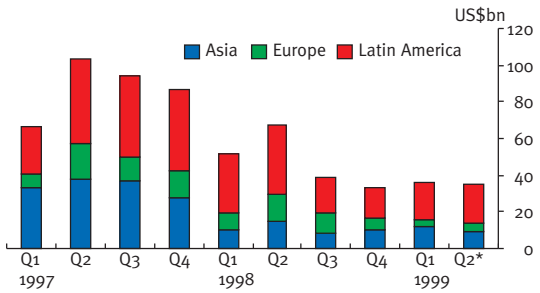
US$ billions

	1997	1998	1999[a]
Direct investment	116.5	111.0	103.9
Portfolio investment	24.0	2.4	18.7
Other private creditors	119.1	38.6	17.4
Total private finance	259.6	152.0	140.0
Net official flows	38.6	49.6	28.6
Net external financing	298.2	201.4	168.6

(a) 1999 figures are IIF forecasts.

Source: Institute of International Finance.

Chart 3: Emerging markets' gross foreign-currency borrowing[a]



(a) Includes bonds, equities and syndicated loans. Excludes borrowing from IFIs and other official financing.

* Up to 18 May 1999.

Source: Capital DATA Bondware/Loanware.

Chart 4: Emerging markets' sovereign-bond yield spread[a]

(a) The EMBI and EMBI+ are market tracking indices created by JP Morgan. The EMBI tracks only Brady bonds while the EMBI+ is a broader index covering other instruments as well.

Source: JP Morgan.

Capital market flows

In 1999, the international agencies expect a sharp reduction in net official flows to EMEs more than to offset a small rise in net private capital flows, resulting in a fall in total net capital flows to EMEs for the third consecutive year. The IMF expects total net capital flows to emerging market economies to increase to US$148bn by 2000, which would still be about 30 per cent below net inflows in 1996, when they peaked. It expects net portfolio flows to decline in 1999, as in 1998, but to recover in 2000. Net direct investment flows are also expected to pick up after moderate reductions in 1998 and 1999. The private Institute of International Finance expects net private capital flows to be roughly unchanged in 1999 (see Table 2). But, within that, outstanding loans by commercial banks are forecast to fall for the second year running.

So far this year, bond issuance by emerging-market economies has recovered more than direct bank lending. Total gross foreign-currency financing flows to the major emerging markets appear to have reached a trough in 1998 Q4 (see Chart 3). In the wake of the Russian crisis, difficult market conditions initially made new issues more or less impossible, and when borrowers of better credit standing were able to return to the market it was for small amounts and usually via the re-opening of existing issues. Since early February, however, larger and more regular issuance has been possible. Sovereign issuers have predominated, but banks and some corporates have also returned to the market. Argentina, Brazil, Korea (Korean Development Bank), Malaysia and Mexico have all issued in single amounts of US$1 billion or more, and Chile, Colombia, Hungary and Philippines have made US$500 million issues. The opportunity has been taken to smooth out approaching humps in maturity obligations (for example, in Mexico) or more generally to lengthen the average maturity of debt (for example, in Argentina). It is striking how soon after the onset of a crisis the EMEs have been able to return to the international bond markets. This contrasts sharply with the aftermath of the 1980s' debt problems.

Data from the Emerging Markets Traders Association show trading volumes for debt instruments rising slightly in the first quarter of 1999 compared with the final quarter of 1998, but they are still more than 50 per cent below the level a year earlier.

Market indicators of emerging-market economy risks

The recent improvement in the economic position and outlook amongst the EMEs has been reflected in financial

Table 3: Sovereign-bond yield spreads (basis points)

Bond	28 May 99	4 January 99	28 May 98
Asia			
Indonesia 2006	780	1031	790
Korea 2008	222	355	441
Malaysia 2006	293	545	301
Thailand 2007	201	317	313
Latin America			
Argentina 2006	736	628	419
Brazil 2008	810	1090	482
Mexico 2008	451	499	337
Venezuela 2007	889	1010	431
Other			
Pakistan 1999	5982	7986	515
Hungary 2000	73	109	50
Poland 2004	68	135	100
Russia 2007	2204	3464	631
South Africa 2006	324	470	207
Ukraine 2000	6299	8874	1241

Source: Bloomberg.

Table 4: Short-term local-currency yields

	28 May 99	4 January 99	28 May 98
Asia	10.19	13.03	20.82
Emerging Europe	33.70	36.91	49.10
Latin America	21.91	26.64	20.48
Middle East/ Africa	12.80	14.28	15.70

Source: JP Morgan

market indicators. The spreads over US Treasury bond yields of the yields on US$-denominated bonds issued by EME governments have generally fallen back from the peaks reached early last autumn, as Chart 4 shows (based on JP Morgan's indices of emerging-market bond yields). That could in principle have a number of explanations. It would be consistent with a fall in the perceived riskiness of lending to EME governments since the beginning of the year. It might also reflect some recovery in appetite for risk and in market liquidity, unwinding part of the increases in risk and liquidity premia which were widely commented on by market participants during the period of market turbulence last autumn.

In Latin America, spreads have fallen since spiking upwards in January after the change in Brazil's exchange-rate regime. The chart shows that recent disturbances have been less severe than the financial market shocks last summer. Table 3 shows spreads on a selection of bonds issued by EMEs. They were generally lower in May 1999 than at the beginning of the year.

Short-term local-currency yields (see Table 4) rose in January, particularly in Latin America, in response to the Brazilian depreciation (partly reflecting the attempts of countries to discourage capital outflows by tightening monetary policy). But by the second quarter, they were lower than at the beginning of the year in most regions. That has probably helped to relieve the pressure on borrowers and so reduce the risk of loan defaults; it has also helped stimulate activity in these regions. Most recently, some short-term interest rates have risen in Argentina, although they remain below their mid-January peak.

Since the beginning of the year, the currencies of the crisis-hit Asian countries have been fairly stable against the dollar and have appreciated against the euro. Since inflation in these countries is still above the industrial-country average, real effective exchange rates have appreciated. This tendency has been more pronounced in some Latin American countries such as Mexico whose currencies have also recovered some ground against the dollar.

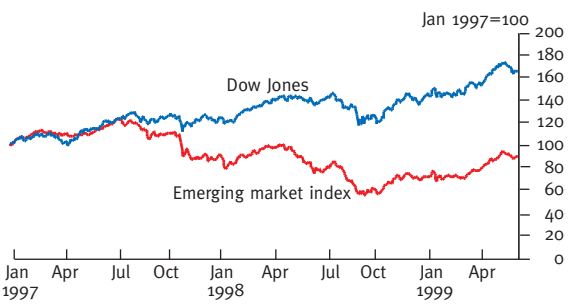
Equity indices in emerging markets have performed quite strongly this year, even when measured in dollar terms (see Table 5 and Chart 5). However, there have been large differences amongst countries. Equity-price volatility has declined from the high levels seen last September and around the New Year.

Table 5: Equity markets (US$ terms)

Country	Change between 4 January 99 and 28 May 99	Change between 28 May 98 and 28 May 99
Asia		
Indonesia	46.8	86.4
Korea	24.7	167.6
Malaysia	39.9	39.8
Thailand	23.7	46.5
Hang Seng	22.9	35.7
Shanghai A	13.3	-8.4
Latin America		
Argentina	19.7	-14.8
Brazil	9.7	-28.6
Mexico	42.6	9.2
Venezuela	11.8	-18.4
Other		
Czech Rep	5.4	2.2
Hungary	-11.8	-20.9
Poland	2.1	-15.2
Russia	68.2	-50.1
South Africa	15.2	-24.2

Source: Bloomberg.

Chart 5: Emerging markets' equity index (in US$) and the Dow Jones industrial average



Source: ING Barings.

II Major industrialised economies and financial markets

As with emerging-market economies, unexpectedly poor economic performance could in principle affect financial stability in the major industrialised economies. There have been downward revisions this year to growth forecasts for Japan and, to a lesser extent, the euro area. In contrast, growth forecasts for the USA have generally been revised upwards. After briefly reviewing each of these major areas, the extent to which risks could arise from global imbalances is assessed, and some recent developments in global capital and credit markets are surveyed.

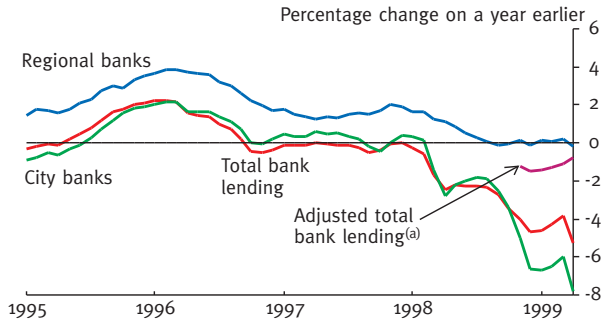
Japan

There have recently been some signs of improving sentiment in Japan. Although it fell slightly during May, the Nikkei 225 index is over 20 per cent above its trough of 12,879.9 on 9 October 1998. That would be consistent with a market perception of improved prospects for corporate profits and reduced chances of bankruptcies, implying reduced risks of financial instability.

However, other indicators of household and business confidence and financial conditions remain weak. Net liabilities of bankrupt firms in March this year amounted to ¥3.1 trillion, the highest ever level in a single month (and about 90 per cent higher than a year earlier). And, in April, bankruptcy debt rose by a further ¥1 trillion. Lending by Japanese banks continues to contract, even after adjusting for debt write-offs relating to bankrupt firms; see Chart 6 and the article by Hoggarth and Thomas in this Review. There is also considerable uncertainty about both the macroeconomic outlook and the progress of restructuring in the corporate and financial sectors. For example, extensive credit guarantees have been given to small and medium-sized companies (they increased by around ¥12.2 trillion, about 3 per cent of GDP, between September 1998 and March 1999; see Chart 7). Total outstanding credit guarantees were around ¥42 trillion in March 1999. Without them, the outlook for these firms would be worse, but there is a risk that the guarantees could inhibit progress with structural adjustments and the removal of excess capacity, as well as adding to government debt if the guarantees are called.

Many non-bank financial firms still have weak balance sheets. The insurance sector in particular is suffering because many firms have guaranteed nominal rates of return to long-term savers which are well above current nominal rates of return on their assets.

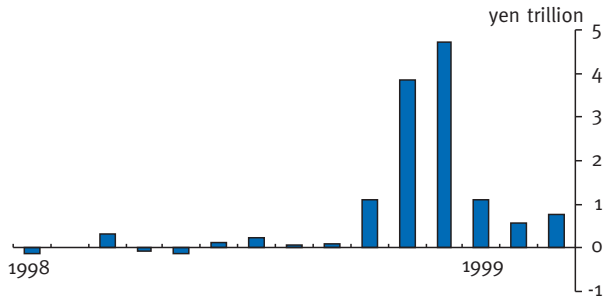
Chart 6: Japanese bank lending



(a) Adjusted for debt write-offs.

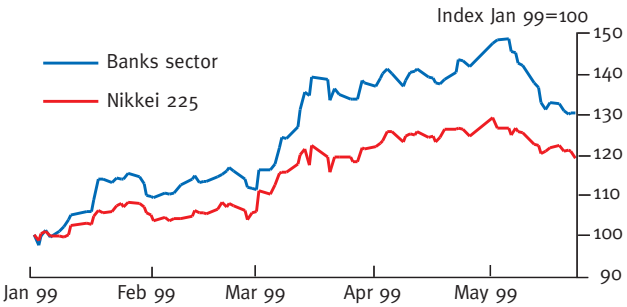
Source: Bank of Japan.

Chart 7: Monthly change in loan guarantees by credit guarantee corporations



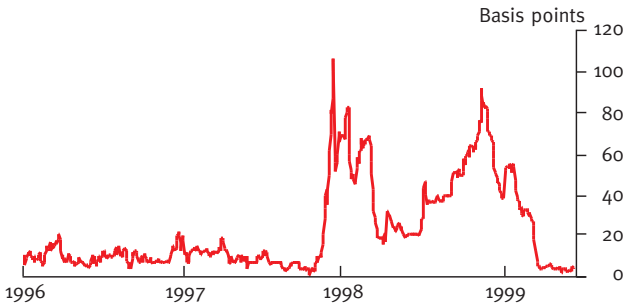
Source: Japanese Credit Guarantee Corporations.

Chart 8: Japanese equity market



Source: Datastream.

Chart 9: Japanese banks' premium(a)



(a) Calculated as the difference between the Japanese bank borrowing rates included in 3m US$ LIBOR rate and actual LIBOR rate.

Source: Bank of England.

In the year to 31 March 1999, Japanese banks reported a 23 per cent fall in aggregate operating profits to ¥2.5 trillion. This included a ¥10 trillion provision for bad and doubtful debts. They are likely to face new non-performing loans as a result of the recession being deeper and more drawn out than expected. But they should now be in a better position to bear those losses, following steps taken by the Japanese authorities over the past year to recapitalise the banks and avoid a banking collapse. On 9 March, fifteen major Japanese banks submitted applications to the Financial Revitalisation Committee for public funds totalling ¥7.45 trillion (about £38 billion), 1.5 per cent of GDP[10]. All retail deposits of internationally active banks are guaranteed by the Deposit Insurance Corporation until 1 March 2001. That has been judged necessary given the financial fragility in Japan, but, looking beyond the eventual resolution of the current problems, it could increase moral hazard. The banks have agreed to an unprecedented degree of structural reform, including closing branches, cutting staff, withdrawing from many overseas operations and pursuing proposals for mergers (eg as announced by Daiwa Bank and Bank of Osaka in mid-February).

The capital position of the banks will also have been helped since last autumn by the rise in the Nikkei, and by the recovery in government bond prices prompted by the Ministry of Finance indication in mid-February that the official Trust Fund Bureau would resume purchases.

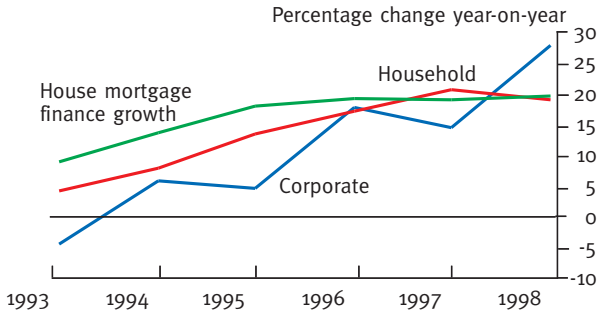
Bank shares themselves have out-performed the rest of the market; the TOPIX bank index rose by 9.3 per cent more than the Nikkei 225 between 1 January and 28 May 1999 (Chart 8). And the premium that Japanese banks have had to pay to borrow in the London market appears to have declined significantly, although that may largely reflect the absence of the weaker banks from the market (Chart 9).

Overall, the uncertainties remain significant, given the Japanese economy's structural difficulties, including the large current and prospective government deficit. While the authorities' actions have averted a spreading financial crisis, Japan's problems continue to pose threats to stability.

The euro area

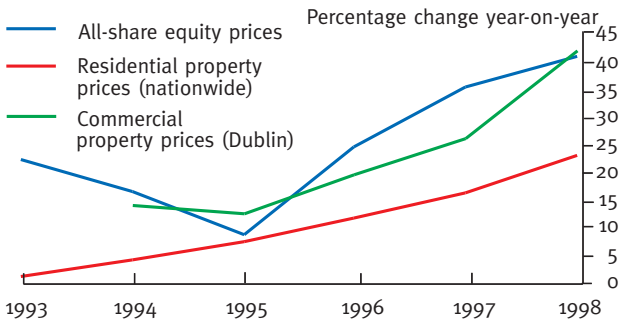
Any slowdown in economic growth across the euro area will tend to impair loan exposures. Major UK banks'[11] cross-border claims on European borrowers were £73.1bn at the end of last year, 8.3 per cent of their total assets, and equivalent to 130 per cent of their regulatory capital. But the picture differs from country to country.

Chart 10: Irish sectoral credit



Source: Central Bank of Ireland.

Chart 11: Irish asset prices



Sources: BIS and Bloomberg.

For example, there are marked differences in the pace of credit expansion. Bank lending to non-government sectors between 1997 Q4 and 1998 Q4 rose by, for example, 25 per cent in Portugal, 23 per cent in Ireland (see Chart 10), and 19 per cent in the Netherlands (IMF data). This compared with private sector credit growth in the year to December 1998 of 9.2 per cent in the euro area as a whole (ECB data). Rapid credit expansion in these countries has been accompanied by sharp rises in asset prices. In 1998, their main equity indices rose by about 60 per cent, 40 per cent and 25 per cent respectively compared with their average levels in 1997.

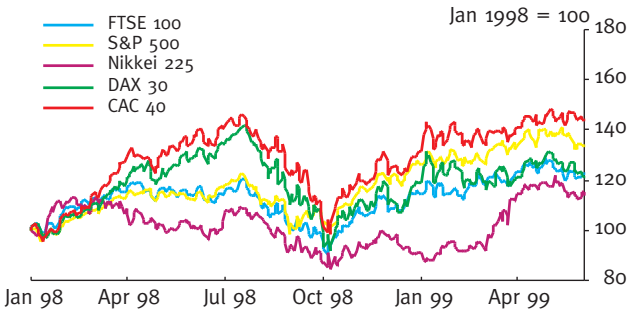
In Ireland, house prices rose by nearly 30 per cent in the year to April 1999, and around 33 per cent in Dublin[12]. This followed rapid growth in 1998 (see Chart 11). Retail price inflation in Ireland is slightly higher than in the euro area as a whole, and short term real interest rates are therefore lower, which will tend to fuel strong credit and asset price increases.

UK exposure is significant: according to Bank of England data, major UK banks'[10] claims on Ireland were £2.5bn at the end of 1998 (after allowing for risk transfers), equivalent to around 5.3 per cent of Irish GDP and 4.5 per cent of these banks' capital.

A number of industrialised countries — for example Japan, the UK and some Scandinavian countries — have in the recent past experienced financial-fragility problems following a period of rapid asset-price appreciation combined with increased leverage in the household or corporate sectors. Severe difficulties, including debt deflation, arose when monetary policy was eventually tightened, and growth slowed below the rates previously expected. In the context of monetary union, monetary policy will be set according to assessments of euro-area wide conditions. Marked differences in inflationary pressures across participating countries would tend to affect real exchange rates, and thus the relative profitability of sectors exposed to international competition.

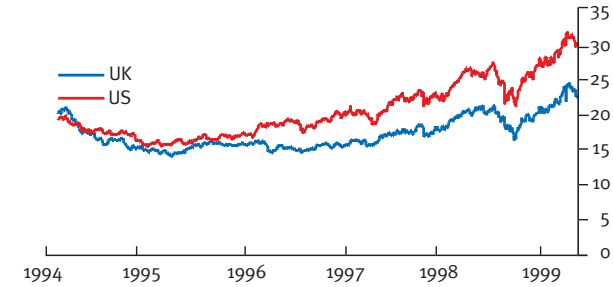
However, rapid credit expansion and asset price appreciation do not inevitably herald financial and monetary problems. It cannot be ruled out that some of the small European economies are experiencing a rapid rise in potential output and more generally "catching up" with the rest of the EU, with that being financed by rapid credit creation and reflected in forward-looking asset prices. The catching-up process may entail changes in the aggregate price level relative to those in core EU countries. Thus, while developments in credit and asset markets need to be

Chart 12: Equity indices in selected countries



Source: Datastream.

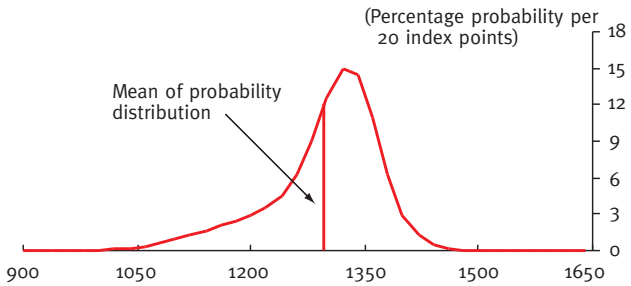
Chart 13: Price-earnings ratios[a]



(a) Datastream broad market index.

Source: Datastream.

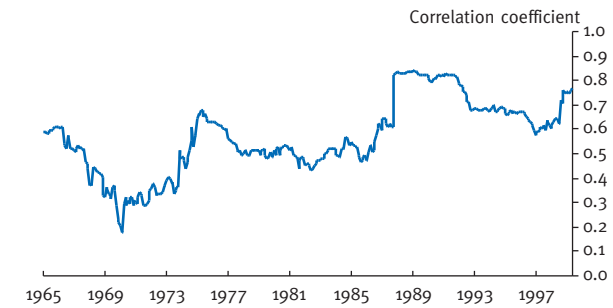
Chart 14: Implied probability distribution[a] for the S&P 500 Index on 17 June 1999 derived from option prices on 25 May 1999



(a) Under certain assumptions, this is the distribution of expectations in the market about what the level of the S&P 500 Index will be at the expiration date of the options from which it is derived.

Sources: Bank of England and Chicago Mercantile Exchange.

Chart 15: Monthly correlation between the S&P 500 index and the FTSE All-share index[a]



(a) Correlation between monthly changes in the two indices (exponentially weighted moving average).

Source: Bank of England.

monitored, the structural and conjunctural circumstances of the countries concerned also need to be taken into account before any risks to financial stability can be judged.

The USA and equity markets

The US economy has now performed much more strongly for much longer than most commentators expected. Growth forecasts for this year have been revised upwards, and equity price increases have continued (see Charts 12 and 13). So far, there are still few signs of inflationary pressures. But against the background of already tight labour markets and ongoing strength in aggregate demand, the US Federal Reserve announced in May a "bias to tighten" its monetary policy.

In the context of assessing financial stability conditions, the focus has to be on downside risks. There is a risk that US economic growth may slow if supply-side capacity constraints were to be reached; the labour market is showing signs of tightness, although manufacturing capacity utilisation remains low. Hitting constraints could dent expectations of profits growth, and so cause equity prices to fall. Another possibility is that some other development triggers a fall in the equity market, which would be a shock to domestic demand through the effect on household wealth and the cost of capital. Whether these or other possible scenarios have any implications for financial stability turns largely on the extent and duration of any price adjustments, and on the balance-sheet strength of market participants.

A Box considers the issue of equity-market valuation and asks whether current stock prices in the US (and the UK) might embody unrealistic expectations of future dividend growth. No one can be very confident in this area, but some indicators raise questions about the level of the market. First, implied dividend growth rates for the US market look high by historical standards, even if the equity-risk premium is assumed to be well below its long-term average. Second, options data suggest that the probability distributions of expectations about the future levels of the US and UK equity markets are skewed downwards[13] (see Chart 14 for the US). Third, world stock-market correlations are at, or near, historically high levels, which has in the past sometimes been associated with high volatility and market corrections (Chart 15). However, it cannot be ruled out that the recent rise in correlations between different markets reflects structural changes, in particular an increase in the mobility of portfolio capital and the greater international scope of the operations of many of the companies included in major stock indices.

Box 3: Equity valuation models

In the light of the sustained rise in major equity markets in the UK, US and elsewhere over the past five years, many market observers have expressed concern about their possible overvaluation. Do equity prices embody expectations of future corporate earnings that are unlikely to be achieved?

The model

To address that question, it is common to employ a valuation model that assumes that the current equity price P_t is equal to the expected stream of future dividends D_{t+j} discounted by the return that investors require (ρ_t):

$$P_t = \Sigma_j D_{t+j}/(1+\rho_t)^j \qquad \text{for } j = 1 ,..,\infty. \qquad (1)$$

In practice, it is often assumed that dividends grow at a constant rate g and that investors discount each future dividend at the same rate ρ. Taken together, these assumptions imply a simple relationship between the price of a share, the one-period-ahead dividend, the expected dividend growth, and the return that investors require. The latter is the sum of the risk-free rate (r_f) and the equity risk premium (k) (the additional premium the investor requires in compensation for investing in a riskier financial asset):

$$P_t = (D_t (1+g)) / (r_f + k - g) \qquad (2)$$

This model can be used to derive the level of share prices given current interest rates and appropriate assumptions about the remaining parameters[1]. If the level implied by the model is substantially below the actual level, that suggests that market participants have unrealistically high expectations of dividend growth or a lower equity risk premium (or that the model's assumptions are flawed). Alternatively, using the observed level of share prices, dividend yields and interest rates, and plausible assumptions about the equity risk premium, the model can be used to estimate an implied growth rate for dividends. That can be compared with benchmarks, which are typically derived from average dividend growth rates over historical periods.

When using such a model to help assess whether an equity market is fairly valued, it is important to be aware of the underlying assumptions. First, inferences about the appropriate level of a share index often rely on the premise of mean reversion. That is, if equity prices at a particular time imply high dividend growth rates by historical standards, it is often assumed that they will fall, on the basis that deviations from the long-term trend cannot persist for long. There are some, however, who in the current context believe that US earnings will continue to grow at rates above the historical trend rate. They attribute that growth to an increase in productivity growth, made possible by, for example, innovations in information technology. This so-called "New Economy" paradigm remains controversial.

Second, the valuation model takes what may be an excessively restrictive view of cash flows, by modelling equity prices as a function of future dividends only. That assumption is reasonable as long as corporations pay out a large and stable part of their earnings in the form of dividends. But, starting in the 1980s, share repurchases have grown in importance. Recent modifications of the basic model employ a broader definition of earnings that includes share repurchases and cash-financed mergers as well[2]. But that only modestly lowers the estimates of overvaluation. Related to this, equation (2) cannot be estimated for companies that have never made a profit or paid a dividend, yet have a high market capitalisation, such as some internet-related companies.

Third, the valuation exercise requires assumptions about parameters for which either reliable historical data or an adequate theoretical understanding are lacking. That applies especially to the equity risk premium. In traditional finance theory, the equity risk premium is related to aggregate consumption growth and to investors' risk aversion: risk-averse investors require a higher equity risk premium for assets that produce low returns when consumption is low. In the past, researchers have typically used estimates for the equity risk premium that are based on historical excess returns on equity for the post World War I period. But those historical estimates (between 6 per cent and 8 per cent) imply implausibly high risk aversion. That is the equity risk-premium puzzle highlighted by Mehra and Prescott[3].

Recent empirical studies provide some support for a much lower equity risk premium than used in the past[4]. At the same time, research also suggests that the historical equity risk premium is highly variable over time. As a result, the choice of equity risk premium, and therefore the valuation exercise as a whole, involves judgment.

Assessment

Since the beginning of 1997, equity prices in the US and UK have risen by more than 50 per cent[5]. Taking a longer-term perspective, prices in the markets have risen by about 200 per cent and 100 per cent, respectively, since the beginning of 1995. In both markets, some of the smaller-company indices have increased by much less, whereas selected technology indices have risen more than a hundred-fold. This Box focuses on the aggregate market, not on particular sub-indices or industry sectors that may be more or less fairly valued than the overall market.

To what extent was the rise in the aggregate market brought about by movements in interest rates or by investors modifying their expectations of expected dividend growth? Implied dividend growth rates are presented for the UK and the US markets opposite, using three assumptions about the equity risk premium. The benchmark for dividend growth in real terms is 2.46 per cent for the UK, and 2.23 per cent for the US[6].

On the assumption of an 8 per cent equity risk premium, implied dividend growth rates for both markets are very high compared with long-term benchmark dividend growth rates. However, assuming that investors today are willing to accept a lower equity risk premium (say 4 per cent), the implied rate of dividend growth would be lower, but still above the historical average. Interestingly, the gap between implied and historical growth rates has not changed very much in the past two years, even though prices have risen markedly.

Implied real dividend percentage growth rates
(Datastream total market indices)

	1 May 1995	1 May 1996	1 May 1997	1 May 1998	28 May 1999
UK					
ERP = 4%	3.65	3.89	4.00	3.99	3.33
ERP = 8%	7.49	7.75	7.86	7.88	7.24
US					
ERP = 4%	-	-	5.63	6.35	6.54
ERP = 8%	-	-	9.56	10.30	10.49

Source: Datastream and Bank calculations
Calculations use benchmark index-linked yields
ERP: equity risk premium

Notes

1 See eg Brealey R and Vila A (1998): "Equity Prices and Financial Stability," *Financial Stability Review*, 4, pp 10-18.

2 See eg Wadhwani S. (1999), "The US Stock Market and the Global Economic Crisis," *National Institute Economic Review*, pp 86-105.

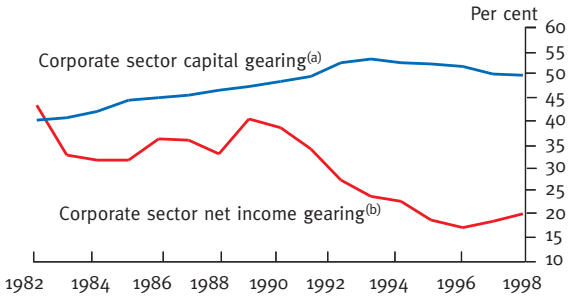
3 Mehra R and Prescott E (1985), "The Equity Premium Puzzle," *Journal of Monetary Economics*, 15, pp 145-161.

4 See Wadhwani S (1999) for a summary of recent research.

5 Price rises were calculated for Datastream Total Market indices.

6 Defined as the average annual dividend growth for the period 1919-1997 for the UK, and 1947-1996 for the US. Sources: Barclays Capital Equity-Gilt Study and Campbell J (1998), "Asset prices, Consumption and the Business Cycle", *NBER Working Paper* 6485.

Chart 16: US corporate-sector gearing ratios

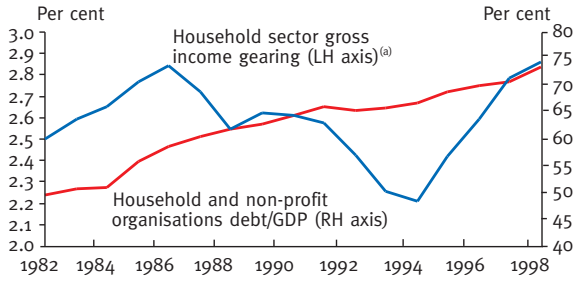


(a) Gross debt / gross assets.

(b) Net interest / corporate profits (with inventory valuation and capital consumption adjustments).

Sources: Datastream and US Federal Reserve Flow of Funds Accounts.

Chart 17: US household-sector financial ratios



(a) Interest paid by US household sector / disposable personal income.

Sources: Datastream and Federal Reserve Flow of Funds Account.

As noted above, the implications for financial stability of a market correction, if one were to occur, would depend in part on the condition of household and corporate balance sheets. In the US, measures of corporate-sector strength (Chart 16) have on the whole changed by less than indicators of household financial strength. The household saving ratio dropped below zero at the end of 1998, the propensity of households to consume out of current income perhaps being increased by rapidly increasing financial wealth. There has been a rapid build-up of the gross debt of households over the past few years, from 66 per cent of GDP in 1993 to 73 per cent in 1998 (Chart 17). Personal-sector income gearing (debt-service payments as a fraction of disposable income) is at historically high levels. Capital gearing has not changed much, but that is partly because rising equity prices have kept net worth (valued at market prices) in line with increases in debt. (House prices across the US as a whole have been rising at about five per cent per year, much less than equity prices.)

Some commentators have suggested that banks have been aggressive in the consumer-credit sector, moving down the credit scale. Many have been active in the home equity securitisation sector, which has not yet been tested in a recession. A recent report by Standard and Poor's predicted that, although problem loans are at historical lows, the US banking sector could see deteriorating asset quality following rapid loan growth in the recent past (domestic credit rose from 95 per cent of GDP in 1994 to 130 per cent in 1998). The report highlighted lending to the sub-prime consumer sector as well as high-yield loans and loans to real-estate investment trusts as vulnerable areas. However, according to FDIC data, Tier 1 capital ratios remain well above regulatory limits. For both commercial banks and savings institutions (insured by the FDIC) this core capital ratio was over 7 per cent in 1998.

Capital and current-account imbalances

The previous sections analysed the EMEs and industrialised economies separately. Interactions amongst different economies, via financial markets or trade flows, and through the corresponding accumulations of external debt, can both propagate shocks arising within specific countries and generate adverse shocks themselves. Large increases in current-account imbalances across countries have sometimes given rise to concerns that the corresponding capital flows could prove unsustainable. Such fears can trigger financial-market turbulence and sudden exchange-rate realignments, risking strains in financial systems. They can also provoke protectionist measures. In fact, global payments imbalances have tended to increase since 1996.

Table 6: Selected economies: current account positions (percent of GDP)

	1996	1997	1998
G7 economies			
United States	-1.8	-1.9	-2.7
Japan	1.4	2.2	3.2
Germany	-0.6	-0.2	-0.4
France	1.3	2.8	2.7
Italy	3.3	3.0	2.3
United Kingdom	-0.2	0.6	-0.8
Canada	0.6	-1.5	-2.1
European Union	1.1	1.7	1.4
Selected other economies			
Argentina	-1.4	-3.7	-4.4
Brazil	-3.0	-4.1	-4.5
China	0.9	3.3	2.4
Hong Kong SAR	-1.1	-3.2	0.6
India	-1.4	-1.4	-1.7
Indonesia	-3.3	-3.0	3.4
Korea	-4.7	-1.8	13.1
Malaysia	4.9	-5.1	15.7
Mexico	-0.7	-1.9	-3.7
Nigeria	16.9	4.8	-8.4
Pakistan	-6.5	-5.8	-2.9
Philippines	-4.7	-1.2	2.0
Russia	0.6	-1.3	0.3
Saudi Arabia	0.2	0.2	-10.4
Singapore	15.7	15.8	20.9
South Africa	-1.3	-1.5	-2.1
Taiwan Province of China	4.0	2.7	1.3
Thailand	-7.9	-1.9	12.2
Turkey	-1.4	-1.4	1.4

Source: IMF World Economic Outlook, May 1999

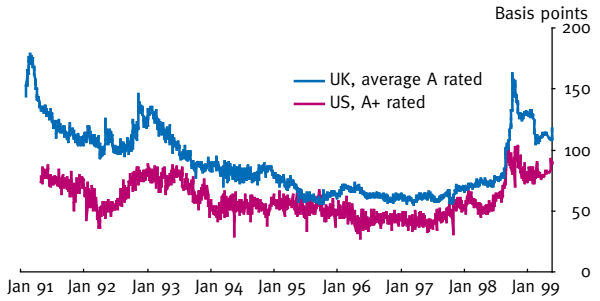
As described in section I, following the crises of the past two years, net capital flows to emerging-market economies collectively are estimated by the IMF to have fallen (while remaining positive) in both 1997 and 1998. The constraints on domestic expenditure and the sharp falls in real exchange rates since the onset of the crises have caused big changes in EME current accounts. The aggregate current-account balance of Asian emerging economies moved from deficit to surplus, increasing by around US$140bn between 1996 and 1998. Korea's balance, for example, switched from a deficit of 4.7 per cent of GDP to a surplus of 13.1 per cent of GDP (see Table 6). The data also show that the dispersion of current-account deficits and surpluses across countries was greater in 1998.

Against this background, for global demand growth to be sustained, domestic demand growth has probably needed to be stronger in the industrialised world as a whole. In fact, though, the US has been the main source of G7 demand growth, running an increasing current-account deficit and thus accumulating external debts. As the IMF conclude in their latest World Economic Outlook, "the significant current-account imbalances in 1998 and prospectively in 1999-2000 raise the question of sustainability more broadly than for the United States alone". The IMF have attempted to estimate the underlying current-account positions of selected countries, adjusting for the fact that business cycles are not synchronised and that past exchange-rate changes may not have fed through fully. At the same time, they try to abstract from the transitory effects of the Asian crisis. They find that, without further changes in exchange rates or in domestic saving and investment, "the underlying current-account positions of a number of advanced economies are of a magnitude that could result in growing stocks of external liabilities or assets in relation to GDP". It is, however, hard to judge what would prove unsustainable, and what precisely could precipitate a reassessment. Participants in financial markets — in both industrialised countries and in EMEs — nevertheless need to take account of the risks implied by these imbalances in their lending, borrowing and investment decisions.

Credit-market developments

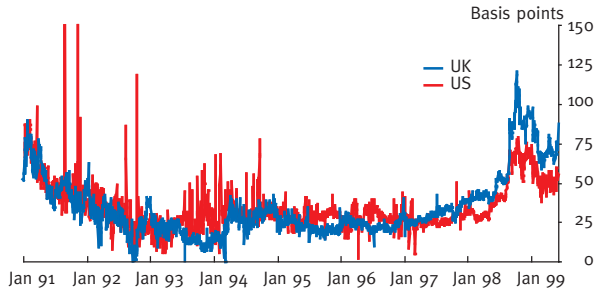
The impact of the Russian default last summer and the near failure of the LTCM hedge fund in September prompted very sharp rises in interest-rate spreads. It is difficult to assess to what extent that was attributable to a deterioration in credit assessments, a reduced appetite for risk, or a higher premium for liquidity, but it was generally taken to signal an increase in fragility. For most of this year, conditions in credit and liquidity markets have generally been calmer than in the final quarter of 1998. For example,

Chart 18: Corporate bond spreads



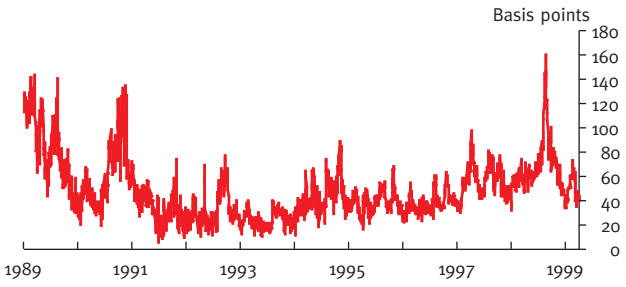
Sources: Bloomberg and Bank of England.

Chart 19: Par swap spreads, 10 year



Sources: Bloomberg and Bank of England.

Chart 20: US$ 3-month LIBOR spread over US$ 3-month T-Bill yield



Sources: Bloomberg and Bank of England

US and UK bond and swap spreads have fallen since last autumn (see Charts 18 and 19), as have the spreads of the three-month dollar LIBOR rate over the yield on three-month US Treasury bills (Chart 20). A Box discusses the interpretation of corporate bond spreads.

Measures of bond (and equity) market implied volatilities, derived from options prices, have edged down this year after a sharp increase, and subsequent partial recovery, in the latter half of 1998. They remain higher than before August 1998 and the Russian financial crisis. If these data provide an accurate reflection of the underlying volatility of capital markets, they suggest that market risk has fallen since last autumn.

Corporate borrowers have now returned to capital markets, after a period in which many — particularly in the US but including some major UK corporates which borrow in US dollars — resorted to bank back-up lines of credit rather than issuing commercial paper. Bond market liquidity, as measured by bid-offer spreads, has also improved since late 1998. The market for high-yield debt has reopened. Several companies rated sub-investment grade by S&P and Moody's have been able to tap the international bond markets in euro and sterling. By contrast, syndicated lending has dropped off this year, possibly reflecting the recovery in bond market conditions. In the five months to May 1999, global syndicated-loan and international bond issuance totalled US$475bn and US$670bn respectively, compared to US$605bn and US$466bn respectively in 1998 Q1[14].

Notwithstanding markets having calmed, last year's events do seem to have had some continuing effects on behaviour in credit markets.

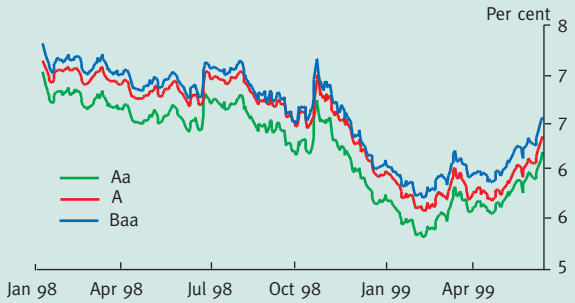
First, spreads in bond and syndicated loan markets remain higher than before the Russia and LTCM shocks. Some widening is probably welcome, and would tend to be supportive of stability, given the apparently widely held view amongst market participants that spreads had earlier been compressed below levels consistent with prudent credit assessments. It is, however, difficult to calibrate the effects on lending capacity of the Japanese banks having effectively withdrawn from the market, and of the wave of bank mergers in Europe.

Second, there seems to be greater differentiation in the terms available to borrowers of different credit standing. Such a development would also be welcome in general terms, as better pricing of credit exposures should help to sustain stable conditions.

Box 4 Corporate bond spreads

Following the Russian and LTCM crises in autumn 1998, the cost for corporates of raising finance through the bond markets rose steeply (by some 50 basis points) in October 1998. This was accompanied by market speculation that corporates might suffer a 'credit crunch', defined as a significant reduction in the supply of credit given the general level of real interest rates and the credit standing of borrowers[1].

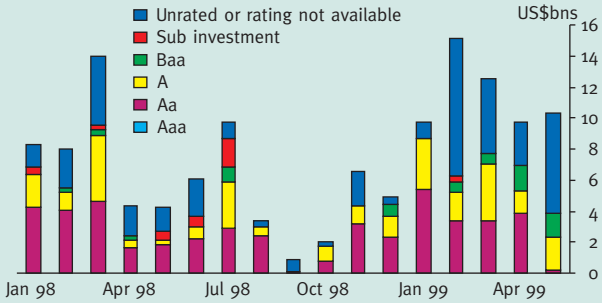
Chart 1: UK corporate bond yields by credit rating[a]



(a) Calculated from five-year duration corporate bonds.
Sources: Reuters and Moody's.

There was clear evidence of reduced borrowing by corporates in the bond markets from August to October 1998 (see Chart 2 below). At the time, anecdotal evidence suggested that this stemmed mainly from a choice by corporates not to borrow in the bond markets at spreads that were regarded as being at temporarily high levels.

Chart 2: UK non-government international bond issuance by credit rating[a]

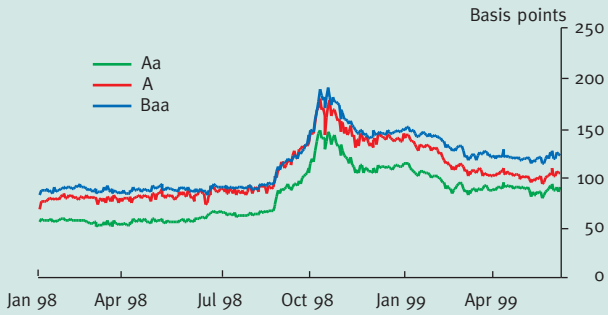


(a) Ratings data received with a lag.
Source: Moody's.

The cost of bond finance is related to the risk-free interest rate, the credit standing of the borrower and the liquidity of the instrument. Corporate borrowers typically pay a premium over that paid by governments due to the greater risk of default on their debt repayments. Chart 3 shows the spread between yields on government bonds and yields on corporate bonds of varying credit qualities from January 1998 to May 1999.

Was the increase in spreads a reflection of perceived changes in default probability at the time of the crisis? There are two other possible explanations. First, bond investors may be risk averse and add a premium to the risk-neutral price of default risk; their degree of risk aversion might have increased. Second, at a time of market turbulence, bond investors attach more importance to liquidity, bidding up the price of government bonds relative to less liquid corporate bonds. Large bond issues of high credit quality tend to be more liquid than smaller bond issues of low credit quality. Thus, changes in investor risk aversion and the demand for liquidity could potentially raise the cost of borrowing for corporate bond issuers even if there were no rise in perceived default risk.

Chart 3: UK corporate bond spreads by credit rating[a]



(a) Calculated from five-year duration corporate bonds, spreads over duration-matched gilts
Sources: Reuters and Moody's.

There is some evidence that liquidity preference played a role in the widening of corporate bond spreads during the autumn crisis. For example, the spread between on-the-run and off-the-run US Treasuries increased by a factor of four between the beginning of September and October. A similar phenomenon was seen in the gilt market. Since no default risk is attached to these government securities, the main factor driving this spread widening was probably demand for liquidity.

Note

1 See the Box "What is a credit crunch?" on page 6 of the November 1998 Bank of England *Inflation Report*.

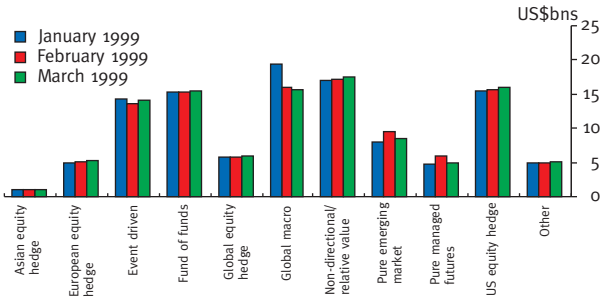
Third, there are signs of continued use of so-called "market flex" clauses in syndicated-loan agreements, introduced in Europe during last autumn's turbulence. Such clauses are designed to enable the bank(s) underwriting a syndicated loan to alter its terms if there is a significant change in the market environment while they are on risk; broadly similar provisions are an established feature of bond issues. This would tend to increase the uncertainty faced by a borrower, but could potentially help to protect banks from incurring mispriced exposures in unexpectedly turbulent conditions. The Bank will continue to monitor developments in these markets.

Leverage and prudent risk-management practices

The extent to which any economic or financial shocks have implications for the wider financial system depends in part on the extent of leverage in the system, and the adequacy of risk management controls[15]. Anecdotal evidence from financial markets suggests that financial institutions reduced their leverage following the near-collapse and refinancing of LTCM in late-September 1998. That episode abruptly reminded investors and lenders, in both the regulated and non-regulated sectors, of the risks inherent in highly leveraged positions, including via exchange-traded and OTC derivatives[16]. Such instruments can be used to increase gearing significantly because the associated funding requirement, in the form of a margin payment, is small. Similarly, if asset positions are financed via repo but without an initial margin requirement, limitless gearing is in principle possible. Market comment suggested that investor risk tolerance fell in the months immediately following the LTCM and Russian crises. Whilst that is difficult to assess, the assets managed by the hedge funds monitored by TASS Management fell by some 20 per cent between August 1998 and March 1999 (see Chart 21 for changes in 1999). Estimates of redemptions by investors at the end of 1998 range from five to ten per cent of hedge funds' total assets. Much was also said about more prudent practices amongst financing counterparties.

More recently, some market anecdote has suggested that financial institutions may have been rebuilding their positions this year, and that hedge-fund activity in particular may have picked up. There have also been some suggestions that lenders to highly leveraged institutions may have begun to relax their terms again, for example by reducing or waiving "initial margin" requirements, despite the obvious lessons of last year's events and the clear recommendations about good practice drawn up since the LTCM episode (see, for example, the Brockmeijer Report (1999)[17], which is summarised in the accompanying article by John Drage and Fiona Mann). It is difficult to know how

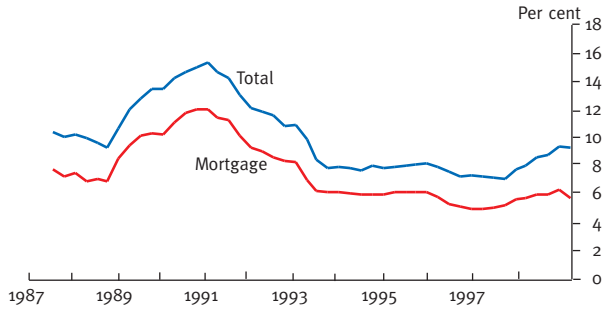
Chart 21: Hedge funds' estimated assets[a]



(a) The Tass Funds Database covers 1,350 funds with US$110bn of capital. Estimates of the number of hedge funds and capital from other information providers and fund advisers range from 2,500 to 3,500 funds with between US$200bn and US$300bn of capital.

Source: TASS Funds Database.

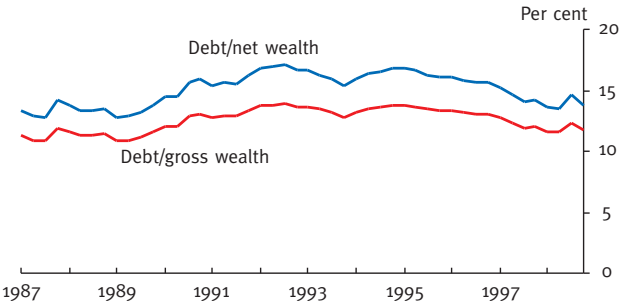
Chart 22: UK household-sector income gearing[a]



(a) Interest payments as a proportion of household domestic income. Household sector income data are seasonally adjusted.

Source: Bank of England.

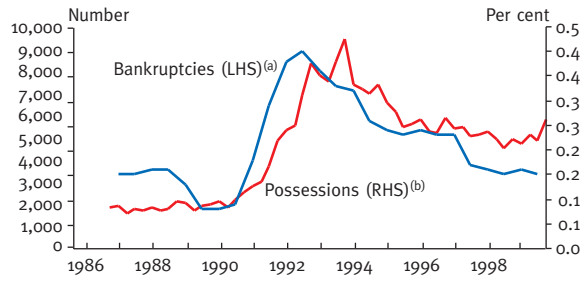
Chart 23: Household-sector capital gearing[a]



(a) M4 lending to household sector as a proportion of residential and financial wealth. M4 data are seasonally adjusted.

Source: Bank of England.

Chart 24: UK house possessions and bankruptcies



(a) Relates to the self-employed and other individuals.

(b) Percentage of outstanding stock of mortgages.

Sources: ONS and Council of Mortgage Lenders.

much weight to place on this anecdote. But it is important that those recommendations are implemented by all institutions, even as memories of last autumn's events fade.

III The United Kingdom

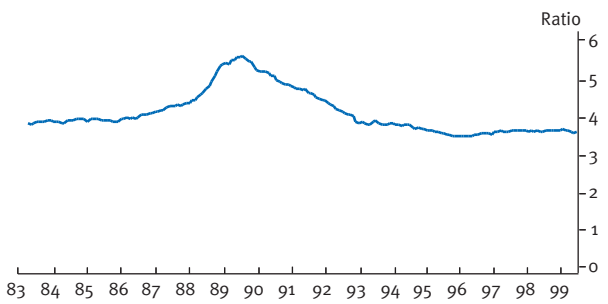
The Bank of England's May Inflation Report presented a comprehensive review of recent economic developments. Activity growth has been below trend for the past year or so and that is likely to lead to a cyclical increase in loan provisions, other things being equal. But banks and other intermediaries probably anticipated the downturn, which market comment suggests may even be proving less pronounced than was expected in the autumn. It seems likely that not only will inflation be more stable in this cycle, but also that the amplitude of the cycle in output growth will be smaller, particularly compared with the late 1980s and early 1990s. That might affect the pattern of financial risks incurrred by financial intermediaries and their customers.

Households

Risks to financial stability from the household sector currently seem modest. Income gearing has tended to increase since 1997 but the rises have been small compared with the beginning of the decade. Capital gearing was broadly unchanged in 1998 (see Charts 22 and 23). Following several years of improvement, the household sector's financial position has stabilised over the past year or so. Unsecured lending to consumers has continued to rise rapidly, possibly reflecting a fall in its price relative to other forms of credit as new entrants have come into the market. Although there seems to have been substitution away from equity withdrawal as a means of financing consumption, mortgage debt still accounts for the majority of household borrowing. The number of possessions carried out by mortgage lenders, mortgages in arrears and personal bankruptcies all stopped falling last year, but remain at levels well below the peaks of the early 1990s' recession (see Chart 24)[18].

The ratio of house prices to earnings is below its average since the mid-80s of 4.2 and the high of 5.6 reached in the late 1980s (see Chart 25). House prices have, however, recently been rising quite rapidly in some parts of the country, particularly the South-East. Loan-to-value ratios for first-time buyers (81 per cent in 1999 Q1) are below the peak of 91 per cent reached in 1997 Q2. By contrast, the loan-to-income ratio for first-time buyers is close to the peak of the 1980s boom. The utility of these ratios as measures of potential strain may, however, be affected by changes in lenders' risk-management techniques since the

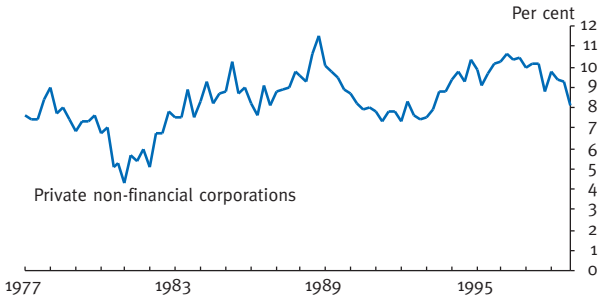
Chart 25: UK house-price-to-earnings ratio[a]



(a) Halifax house prices divided by ONS whole-economy earnings. Data are seasonally adjusted.

Sources: Halifax and ONS.

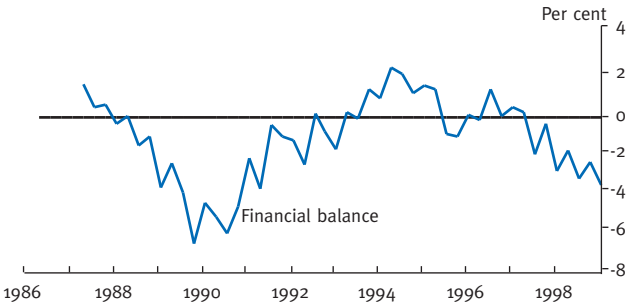
Chart 26: Net rate of return on capital[a]



(a) Net operating surplus divided by the current value of capital employed.

Source: ONS.

Chart 27: Private non-financial corporations' financial balance[a]



(a) As a percentage of GDP. Data are quarterly and seasonally adjusted.

Source: ONS.

early 1990s recession. There is greater emphasis now on credit scoring and assessment of the ability of borrowers to repay. It is too early to judge their impact.

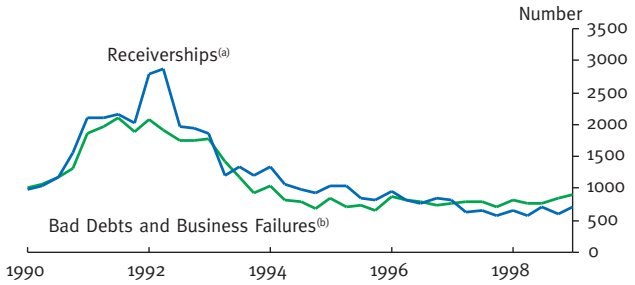
Corporate sector

The corporate sector's financial position has deteriorated over the past year, reflecting decelerating domestic demand and the impact of the world economic slowdown, together with the sustained strength of sterling, on the traded-goods sector. In 1998 Q4, gross operating profits of private non-financial companies (PNFCs) fell by 2.1 per cent, to 19.2 per cent of GDP (compared with 21.3 per cent of GDP in 1996 Q3). The pre-tax real rate of return on capital, according to the Bank's estimates, fell from a peak of 10.7 per cent in 1996 Q2 to 8.1 per cent in 1998 Q4 (see Chart 26); company-accounts data also suggest some erosion of profit margins in the period 1997-98. Latest data for 1999 Q1 suggest a further fall in the profitability of the corporate sector. Including financial and public corporations, corporate profits fell by 3.2 per cent over the quarter and by 9.4 per cent compared with a year earlier. Corporate investment spending has continued to grow steadily over most of this period, both absolutely and relative to GDP (although the most recent data for business investment suggest — provisionally — a reversal in this growth in 1999 Q1). Together, that has meant a gradual widening of the corporate sector's financial deficit, to reach nearly four per cent of GDP by the end of 1998 (see Chart 27).

Increased financial pressures in the corporate sector are also reflected in insolvency data. Total receivership and administration appointments in England and Wales were nearly ten per cent higher in 1999 Q1 than a year earlier, according to DTI figures (see Chart 28). Dun & Bradstreet report that business failures rose by 21 per cent over the year to Q1: bankruptcies (including the failure of partnerships, associates and sole traders) were 32 per cent higher, while liquidations (incorporated businesses) rose by 8 per cent. Customers of Euler Trade Indemnity also report that payment defaults rose by 9 per cent in the year to Q1, to their highest level for five years. This might suggest a deterioration in cash flows, presaging a further rise in insolvencies during the rest of 1999. However, the Bank's discussions with some of the main lending bankers have not yet indicated accumulating problem cases; and the Bank's regional Agents also report that accountants are seeing lower-than-expected levels of insolvency work (although this is hard to square with the DTI numbers, which show a large rise in administrations in 1999 Q1).

Within the corporate sector as a whole, profit warnings have

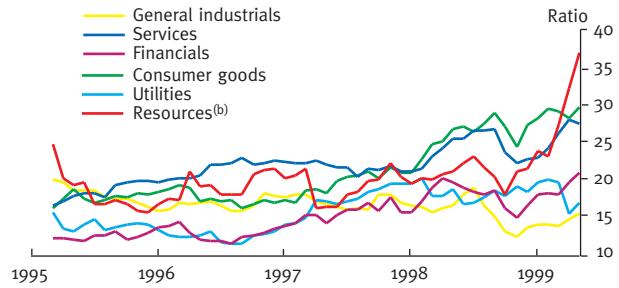
Chart 28: Bad debts and business failures



(a) Receiverships, administrations and Company Voluntary Arrangements. Source: DTI

(b) Source: Euler Trade Indemnity.

Chart 29: Sectoral P/E ratios(a)

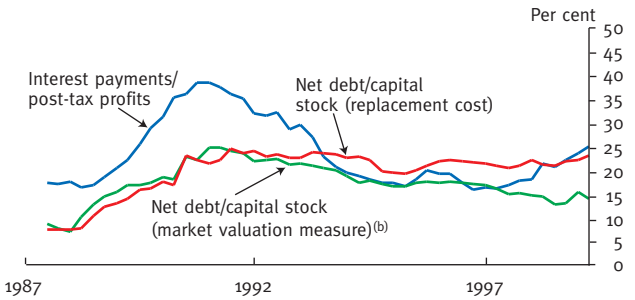


(a) End-month data.

(b) Mining, oil and gas.

Source: Datastream

Chart 30: Private non-financial corporations' income and capital gearing(a)



(a) Seasonally adjusted.

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

Source: Bank of England.

been running at higher levels over the past six months than over the same period a year previously, especially among engineering/electronics firms, and retailers. Z-score measures[19] of company risk also suggest rising pressures in the media and extractive industries sectors. But profit warnings appear to have levelled off somewhat over the past three months (although the data are highly seasonal). And measures of business optimism, after declining sharply in 1998 H2, have recently recovered; for example, the CBI business optimism indicator rose from –40 to –6 between January and April.

This recovery in business optimism has been accompanied by a return of major companies to capital-market financing. Capital issues by private non-financial corporations rose from £4bn in 1998 Q4 to £7bn in 1999 Q1. With bank lending to corporates also holding up, there was a substantial increase in external financing in 1999 Q1. Given that ONS data show a fall in investment in Q1, that may be linked to increased merger and acquisition activity. Corporate deposits also appear to have risen significantly in 1999 Q1.

Somewhat improved optimism over the outlook may have contributed to the further rise in UK equity prices, with price-earnings ratios continuing to trend upwards. As Chart 29 shows, the largest rises in the most recent past have been recorded in the resources and services sectors (the former possibly reflecting the recovery in oil prices). Price-earnings ratios have been flatter in general industrials and utilities (perhaps in the latter case reflecting increased competition).

Income gearing has been rising but remains below the levels of the early 1990s recession (see Chart 30). Interest cover, as measured in company reports and accounts, has been running at about six times, compared with a trough of four and half times in 1991. That partly reflects the much lower peak in nominal interest rates in the current cycle, together with the fact that the corporate sector has not sharply increased its borrowing in the way it did during the 1980s. Using market valuations of assets, capital gearing has been falling, reflecting the strength of the equity market. Using the replacement cost of assets, capital gearing has increased slightly.

Overall, the financial position of the corporate sector has deteriorated over the past year, but that has been less marked than in the early 1990s recession. And while parts of the corporate sector are clearly under pressure, measures of indebtedness for the sector as a whole indicate that it should be better placed to weather a period of slower

growth than in recent business cycles. As such, the evidence suggests that the financial position of the UK corporate sector is not currently a material threat to financial stability.

The commercial property market

The commercial property market has in the past frequently been a source of financial instability in the UK, as in many other countries. On several occasions, development activity was stimulated by projections of rental and capital growth that proved unrealistic after unexpected contractions in demand. Bank exposures to commercial property expanded significantly in the early stages of these cycles but the underlying security was subsequently hit by the impact of over-supply on commercial-property values.

Current developments in the commercial property market, and prospects for the next year, suggest that the risks of a re-emergence of such problems at the moment are relatively modest. Annual growth in total returns from commercial property peaked in July 1998, at 17 per cent, and fell to 11 per cent by April 1999. This downturn, which reflected the more general slowdown in the UK economy, has been accompanied by slower growth in both capital values and rents. But it has been more muted than in recent cycles relative to the fall in GDP growth. Industry commentators attribute that to more restrained development activity, which is also said to have focused mainly on pre-let property rather than "speculative" schemes (again in contrast with previous cycles).

According to valuers[20], property returns have fallen by less than yields on other investments. The yield gap between commercial-property rents and long-maturity gilt yields has been increasing for the past two years or so, and now stands at around 150 basis points on average (ranging from around 100bp to around 300bp depending on the type of property). Some market comment suggests that this has made property investment attractive (which would tend to narrow the yield gap other things being equal). Perhaps reflecting that, flows of bank lending to commercial property have been rising significantly over the past two years. The level of lending increased by 5.5 per cent (some £2.2bn) in 1999 Q1 alone. But there is some — largely anecdotal — evidence to suggest that this lending has mainly financed investment properties or pre-let developments at relatively low loan-to-cost ratios. High-value transactions in the market are said to be based on more reliable cash-flow forecasts than in previous cycles. It is, however, difficult to know how much weight to place on industry comments.

Perhaps most important in the context of surveying risks to financial stability, sterling bank lending to property companies has fallen consistently over the past six years as a proportion of total bank lending to corporates, from levels of around nine per cent during the previous property-market downturn in 1991 to five per cent currently.

IV The UK financial system

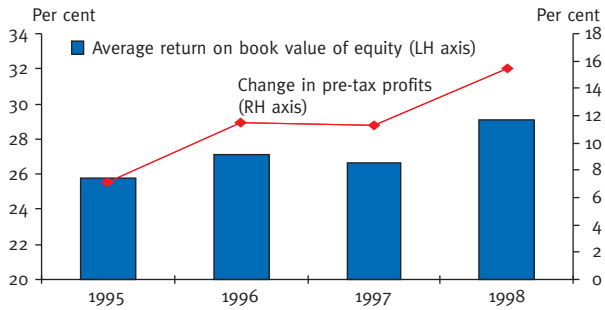
This section offers a broad assessment of some developments in the UK financial system.

The most important part of the UK financial sector from the point of view of financial stability remains the banking industry. That is where the greatest danger of contagion arises in the event of solvency or liquidity problems. The focus in this section is therefore primarily on the banking system, and in particular on a group of the major British banks[21] (MBBG) in aggregate.

Major UK banks: profits, provisions, and capital resources

Assuming prudently valued assets, the published profits and capital reserves of a bank give some indication of how readily it could absorb and recover from adverse shocks. Specific provisions can provide clues, albeit typically with variable lags, as to the shocks suffered in a particular period. Hence the published reports and accounts of banks can potentially be a useful source of information about their resilience and the impact of past shocks (although the backward-looking character of such data is a limitation).

Chart 31: Change in a group of the major British banks' pre-tax profits and return on equity



Source: Published accounts.

Taken together, profits before tax at MBBG banks rose by 16 per cent in 1998 (Chart 31). There were considerable variations in profit performance, but some key trends are apparent. First, net interest income was generally buoyant, growing by 6 per cent for the MBBG as a whole in 1998. Margins were generally maintained, although sometimes at the expense of market share. Strong growth in unsecured personal-loan demand and a revival in corporate-lending growth also contributed to interest income. Second, notwithstanding significant provisions related to pensions mis-selling, activities such as life and general insurance, pensions and investment management made a positive contribution to earnings, generally showing a sharp rise in profits. Third, the volatility of financial markets in 1998 seems to have had only a modest impact on MBBG banks as a whole, although some of the largest banks were affected. Fourth, nearly all MBBG banks recorded lower cost-to-income ratios in 1998 than in 1997. Finally, after allowing for releases and recoveries, increases in provisions were relatively modest, despite the slowdown in the domestic economy and uncertainties in emerging-market

Table 7: Selected data for a group of the major British banks[a]

£ billions unless otherwise stated

	1996		1997		1998	
	H1	H2	H1	H2	H1	H2
Net interest income	10.2	11.1	11.0	11.5	11.8	12.2
Total income	17.7	18.3	19.0	19.1	20.1	19.5
Total operating costs	-10.4	-10.8	-10.8	-11.7	-10.8	-11.6
Operating profit	7.0	7.4	8.2	7.3	9.2	8.0
Charges for bad & doubtful debts	-1.0	-0.9	-1.0	-1.0	-1.1	-1.6
Profit/(loss) before tax	5.6	5.8	6.7	6.0	7.3	7.5
Total assets	934.5	966.2	1070.8	1087.5	1134.3	1129.8
Cost:income ratio	58.5%	60.4%	56.8%	61.5%	54.0%	59.2%
Average interest-earning assets[b]	811.9	806.9	899.7	840.0	969.1	883.8
Net interest margin[c]	2.5%	2.8%	2.5%	2.8%	2.4%	2.8%

(a) Abbey National, Barclays, Bank of Scotland, Midland, Natwest, Royal Bank of Scotland, Alliance & Leicester, Lloyds-TSB, Halifax and Woolwich.

(b) 1998 H1 Lloyds-TSB continuing year basis, as published.

Approximate for Barclays 1996 H2, Midland 1996 H2 and Bank of Scotland 1996 H1, 1997 H1 and 1998 H1. Derived from net interest margin for Midland 1998 H1 and H2 and for Bank of Scotland 1996 H2, 1997 H2 and 1998 H2.

(c) 1998 H1 Lloyds-TSB continuing year basis as published.

Source: Published accounts.

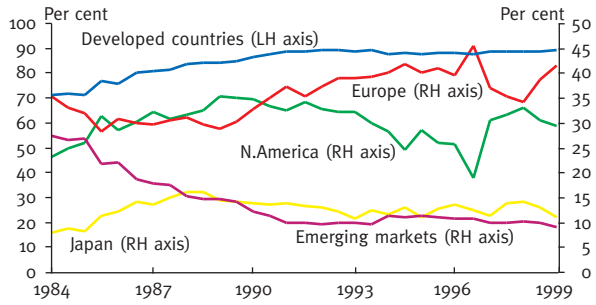
economies. Specific bad-debt provisioning did rise in the second half of 1998, and in some cases the deterioration was worse than outside commentators' expectations. Collectively the major UK banks reduced their provisions against lending to Asia.

The risk-asset ratios[22] of the major UK banks averaged 12.2 per cent, slightly below the 1997 level, but well above the 8 per cent minimum laid down in the Basel Accord. (The FSA also sets higher minimum ratios for individual banks based on their particular circumstances.) The average Tier 1 capital ratio for the MBBG was 9 per cent in 1998, slightly lower than in 1997. Several banks reported that they had excess capital, with a number announcing that they were considering or had recently undertaken share buy-backs.

The pattern of lending by the major UK banks has changed since the recession of the early 1990s, when provisions peaked. As indicated in Section III, lending to sectors that had high write-off rates then — particularly property and construction — has declined significantly as a share of aggregate loan portfolios. Mortgage lending has become

more important. Excluding converted building societies, MBBG banks' sterling mortgage lending represented 30 per cent of total sterling lending in 1998 Q3 compared with 18.4 per cent in 1990 Q4. EME lending has declined as a share of total overseas lending (see Chart 32), and the exposures of the major UK banks collectively have become more diversified across regions. In particular, there has been a sharp decline in new lending to Asia. Liabilities of Japanese banks in the sterling interbank market fell during 1998 (from 4.8 per cent of inter-bank liabilities in February 1998 to only 1.4 per cent in February 1999), leaving UK banks less at risk of liquidity problems from that source.

Chart 32: Selected[a] major UK banks' cross-border claims on different country groups as a percentage of total lending overseas[b]



(a) Barclays, Bank of Scotland, Lloyds-TSB, NatWest and Royal Bank of Scotland.

(b) Data refer to start of period.

Source: Bank of England.

One possible area of concern has been the rapid increase in unsecured consumer credit (17.9 per cent higher in 1998 than 1997, and still rising rapidly), which in the past has been associated with higher write-off rates than mortgage lending (and also higher than most corporate lending). Bankers report that credit-scoring techniques were used relatively early in the present cycle, and that that may help to control these risks. Margins on this business are also higher. And some anecdotal evidence suggests that banks are anticipating widening spreads on unsecured credit over the next few months, reflecting the recent perceived increase in the riskiness of this business.

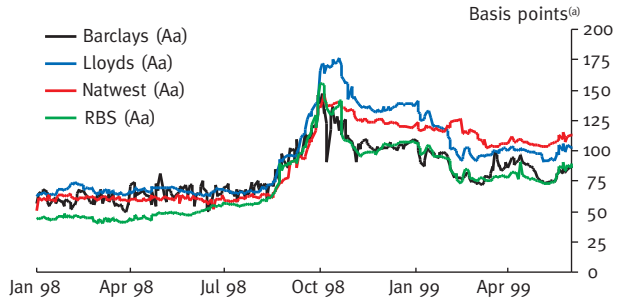
The increasing efforts of the major banks to analyse their business lending in a more sophisticated way might also enable them to assess the risks of loans to different sectors and types of firm more accurately, and price them better, than in the past. Even so, it is difficult to allow for all the important factors in such analyses (as discussed in the accompanying article reviewing a conference on credit-risk modelling held last year).

Some financial market indicators of bank strength

Financial market prices can in principle provide useful indicators of bank strength, depending of course on the scope, reliability and timeliness of published information and on market efficiency. Equity prices should in principle reflect expected future earnings discounted by the risk-free interest rate plus a premium for risk. The spread of the yield on bank bonds over the yield on otherwise similar gilts should in principle provide an indicator of the price of credit risk, although there will also be a liquidity premium.

The ratio of the market capitalisation of the major UK banks, to the book value of their net assets was around 3.5 at the end of 1998, which appears to be higher than banks in, for example, the USA and Germany. As measured by the FTSE bank index, bank shares have tended to out-perform the FTSE All Share index over the past seven years. (They

Chart 33: UK high street bank bond spreads[a]



(a) Calculated from 5-year duration bank bonds, spreads over duration-matched gilts.

Source: Bloomberg.

fell sharply around the time of financial market turbulence last autumn, but have since rebounded.) The persistent out-performance of the banking sector prompts the question of whether required returns are higher, implying perceived greater risks in the sector; or whether there has been a prolonged sequence of positive surprises, compared with market expectations, about the sector relative to the market as a whole.

Around last October, the spreads between yields on major UK bank bonds and otherwise similar gilts rose sharply, possibly reflecting the EME and LTCM crises. Those spreads have fallen back this year, although they remain higher than prior to last autumn's market turbulence (see Chart 33).

The life-insurance industry: guaranteed annuities

Outside the banking sector, the position of the life-insurance industry has a potential bearing on financial stability. During the 1960s, 1970s and 1980s, the life-insurance industry wrote pensions business that guaranteed nominal annuity rates at retirement. These allow policyholders to take the better of the guaranteed annuity terms or the annuity rates available in the market on retirement. It seems that, at the time they were written, firms did not expect that the options would ever be exercised. However, annuity prices have risen sharply, so that the options have become valuable. That reflects improvements in mortality and reductions in nominal gilt yields, largely on account of lower inflation expectations.

According to some industry analysts, if mortality rates had not fallen, it would not have been worth customers exercising most options until long-term interest rates fell to 5.5 per cent. Given the fall in mortality rates, the options typically become valuable at long-term interest rates below around 7.25 per cent. Long-maturity par gilt yields have been consistently below 7.25 per cent since June 1997, and at the end of May were close to 4.75 per cent. Other things being equal, the fall in gilt yields will therefore have tended to increase liabilities relative to assets, thereby reducing the gap between actual solvency margins and the minimum margins required by the industry's regulatory framework.

That could potentially affect insurers' demand for different asset classes, because they can reduce the so-called resilience reserve that they are required to hold by matching the duration of their assets and liabilities more closely. It is difficult to judge whether that could have any wider effects. It could conceivably have a temporary effect on relative asset prices. And, to the extent that ex-post real returns on insurance-based saving products were affected, there might be knock-on effects for some households.

Risks associated with Y2K

Operational risk arising from reliance on information technology is increasingly significant. As well as the risk of problems to their own systems, financial institutions are potentially exposed to credit, market or liquidity risks arising from problems experienced by counterparties, borrowers or suppliers. At present, the focus is on risks associated with the Year 2000 problem. A large amount of preparatory work for this problem is underway throughout the UK economy. In the UK financial sector, preparations are well advanced and there is a high degree of confidence in the market that no significant disruptions will occur. The FSA and the Bank are actively monitoring and urging progress on this front, and are maintaining close liaison. The emphasis is now on working to ensure that the business consequences of any problems are minimised[23].

The possible problems that might arise are of two types. First, there might be direct effects following an actual failure of systems before, or more likely after, the beginning of 2000. Second, there might be 'shadow effects', which could occur if in the run up to the year-end there were to be changes in market behaviour by institutions seeking to protect themselves against perceived risks of computer failure among counterparties or against expected changes in the trading activities of other firms. The Bank has been holding meetings with the major participants in the sterling markets to discuss their plans for liquidity and credit management over the period. Most expect markets to be thinner than normal. There may also be greater demand for the most liquid securities, with corresponding changes in relative prices. At the end of last year, sterling interest rates implied by the December 1999 short sterling futures contract were around 40 basis points higher than the average of the rates implied by the September 1999 and March 2000 contracts. Since futures are based on unsecured interbank interest rates, this spike in rates can be interpreted as an expected increase in the premium required by lenders for unsecured as opposed to secured money, such as gilt repo. Recently, this 'millenium effect' has abated; it was around 7 basis points on 28 May 1999.

The Bank will remain alert to the possibility that these developments could put strain on markets. However, at this stage, there is no sign that, taken together, the plans of the major firms will lead to serious market disruption, and it is important that normal market and price mechanisms operate freely to allocate funds as far as possible. For the Bank's part, it is taking steps to ensure an adequate supply of bank notes in response to the expected increase in demand over the millennium holiday. In line with plans announced in October 1998, it is also extending the range

of collateral against which it supplies liquidity to the banking system, via its routine open market operations, to include sterling and euro-denominated debt issued by other EEA governments and the major supranational institutions.

Liaising with the FSA, the Bank will stay in close contact with market participants. It is also liaising with overseas central banks to monitor international developments and possible cross-border effects. In the United States, the Federal Reserve Board has issued a consultative paper on a proposal to establish a "Century Date Change Special Liquidity Facility". That would allow depository institutions to borrow funds from the Federal Reserve against collateral at a premium over the federal funds rate from 1 November 1999 to 7 April 2000. The Bank will be ready to consider any appropriate remedial action in sterling markets if that were to prove necessary, and is developing contingency plans so that it can move quickly if circumstances change.

V Policy, institutional and regulatory changes designed to promote financial stability

Most of this survey has covered economic or financial developments that could potentially disrupt financial stability. Risk-management practices — at the level of individual lenders, investors, and borrowers — are critical in determining whether the financial system, in the UK and globally, manages to avoid overextending itself and thus maintain its ability to absorb shocks. This section briefly reviews developments in official policies which could also make a difference, whether by affecting incentives, transparency, or the robustness of the infrastructure.

Various potentially helpful changes to the international financial architecture, including to international regulatory agreements, have recently been agreed or are actively being pursued. These are described in the accompanying article by John Drage and Fiona Mann in this edition of the *FSR*. In addition, some important steps have been taken to reduce risks in systemically important payment and settlement systems: through the creation of TARGET, through the merger of UK settlement systems, and through the passing of the Settlement Finality Directive.

Real-time gross settlement for euro area payments

The introduction of the euro at the beginning of the year involved major changes to the infrastructure for making high value payments in Europe. Real-time gross settlement (RTGS) systems were either converted or created to handle euro payments in each EU country. The TARGET network

was established between central banks to link these national systems. Whereas a bank might previously have used correspondent banks in individual EU national centres to make payments in local currencies, it now has the option to make these payments directly throughout the EU using TARGET. TARGET has therefore extended the benefits of RTGS to cross-border, high-value payments within the EU. By removing some large intra-day credit exposures amongst banks, that should help to make the international payments system more robust to shocks, and so help to maintain financial stability.

Steps towards reducing residual risks in the UK payment and settlements infrastructure

In the United Kingdom, CRESTCo, which operates the CREST settlement system for UK and Irish corporate securities, took on the operation of the Central Gilts Office (CGO), the book entry transfer (BET) system for UK government bonds (gilts), on 24 May. Responsibility for the operation of the Central Moneymarkets Office (CMO), the BET system for money-market instruments, will also transfer to CRESTCo, probably later in the summer. It is intended that gilts will be integrated into the CREST system itself in Q2 2000, subject to the necessary technical and legislative changes. That is relevant to financial stability because the amalgamation of UK settlement systems has been judged by the market to be a necessary first step before the introduction of full delivery-versus-payment (DVP), which will bring a major reduction in risk. At present, under the Assured Payments System of CGO and CREST, the settlement banks effectively guarantee the payment obligations of their customers. The resulting obligations amongst the settlement banks are settled, on a net basis, across the Bank of England's books at the end of the day. Thus while real-time DVP — the simultaneous transfer of gilts and payment — is provided to CGO members, there remain inter-settlement-bank exposures during the day. Similar intra-day exposures in the CHAPS wholesale payment system were eliminated in 1996 by the introduction of RTGS, under which the Bank explicitly extends intra-day funds against the highest quality collateral (transferred by repo). The elimination of such intra-day exposures in the CGO Assured Payment System, and in the payment arrangements supporting other financial-asset settlement systems, is important. The changes at CREST should bring that closer.

The Settlement Finality Directive: safer collateral transfers in settlement systems

Preparations are well advanced to implement the EU Settlement Finality Directive (SFD), which aims to reduce systemic risk by removing certain areas of legal uncertainty

in payment and securities-settlement systems. The Directive was adopted in May 1998 and must now be implemented in all EEA countries by December 1999. It will ensure the irrevocability of transfer orders made through "designated" systems prior to the insolvency of a system participant and will protect the interests of participants in securities held as collateral, so that neither should be open to challenge in liquidation. It will also, in certain circumstances, clarify which country's law governs rights to collateral taken or given by participants, which can be important — for example if the collateral is held through one or more intermediaries located in different jurisdictions[24].

Summary

The turbulence in world financial markets set off by the Russian debt default and hedge-fund problems has subsided since last autumn, and money and capital markets in particular are calmer. US and UK bond and swap spreads are still quite high by historical standards, but it is possible that this reflects a more realistic assessment of risks rather than an increase in those risks. The apparent greater differentiation in credit risks seen in bond-market credit spreads is in principle welcome.

The echoes of the financial crises in east Asia and Russia nevertheless continue to be heard. While economic prospects have been improving in Asia, progress with structural reforms is slow in some countries and there are continuing areas of financial fragility, including in China. Russia faces major problems, but direct exposures to it seem to be smaller than a year ago. The change of exchange-rate regime in Brazil was a new shock early in the year. That episode has so far proved less contagious than some feared, and the position has improved.

A number of EME countries are due to make significant debt repayments this year. Some might be helped if the recovery in commodity prices is sustained and growth prospects pick up. The ability of many countries to borrow in the international bond market recently is also an encouraging sign. Whether vulnerabilities in EMEs more generally increase will depend in part on the way in which these capital inflows build up, and in particular on the type and maturity of borrowing. An important lesson from the recent crises is that the structure of emerging-market economy obligations (public vs private, foreign currency vs domestic, short-term vs long-term, debt vs equity) interacts with macroeconomic structures and conditions in ways that can have powerful effects on stability. As indicated in the accompanying article on the "international financial architecture", the Bank believes that encouraging prudent

debt and liquidity-management practices is an important part of the efforts underway to make the system more robust.

The overall economic performance of the industrialised world remains strong, although not well balanced. There are some particular identifiable risks to financial stability: of an equity-market correction in the USA; of overheating in some, albeit small, euro-area countries; from global current-account imbalances; and from continuing problems in Japan. The risks in Japan may have diminished somewhat now that the banking sector is being recapitalised, but the outlook remains highly uncertain. Once Japan has emerged from its current financial problems, steps may need to be taken to avoid a hangover of moral-hazard problems from the actions that have had to be taken to support the financial system.

While it is welcome that markets are now calmer, a note of caution needs to be struck, given anecdotal suggestions of risk-management practices being relaxed as more benign trading conditions are re-established. It is difficult to know how much weight to place on that, but it is clear that firms should heed the lessons set out in the report of the Basel Committee of Banking Supervisors on the prudent conduct of business with highly-leveraged institutions.

In the UK, the slower pace of economic growth and the strength of the pound have been putting pressure on banks' corporate customers, particularly those exposed to foreign competition. But the slowdown now seems likely to be more moderate than previously expected; and compared to the previous cyclical turndown at the beginning of the decade, the banking sector seems to be in better shape. The balance sheets of both the household and corporate sectors suggest they are also more robust now than then, although low capital-gearing ratios depend partly on the level of the equity market. There appear to be some sources of potential pressure in parts of the non-bank financial sector, for example because of the problem of guaranteed annuity rates in the life-insurance industry. But, looked at in aggregate, they currently seem unlikely to threaten financial stability more widely.

There have been some helpful infrastructural developments. The TARGET system, by linking real-time gross settlement payments systems throughout the EU, should reduce intra-day exposures amongst banks active in Europe. In the UK, CREST's absorption of gilt and money-market instruments settlement should help to bring closer the removal of some important remaining intra-day settlement bank exposures. When implemented, the Settlement Finality Directive will address some residual uncertainties about the collateral covering credit exposures in settlement systems. A number of steps have been taken to strengthen the international financial architecture.

A particular set of risks arises in the coming months from the Year 2000 computer problem, including the possibility of credit and liquidity conditions tightening if firms reduce or adjust their activities in anticipation of possible market effects. Together with the FSA, the Bank is monitoring both preparations for the millennium date change and conditions in core sterling markets, and will consider any appropriate remedial action if that were to prove necessary.

Finally, the financial shocks of the past two years are a salutary reminder that many threats to financial stability arise suddenly and are unlikely to be anticipated. That underlines the vital importance of thorough and alert risk-management practices; of adequate capital resources and prudent levels of leverage in individual firms and markets; and of using the increasing amounts of information being made available to assess stability conditions in the round.

Notes

1 The need for prudent debt structures, one of the key lessons of recent crises, is discussed in the accompanying article in this issue of the *FSR* by John Drage and Fiona Mann on work to strengthen the "international financial architecture".

2 Some of the elements of the east Asian crises were described in an article by John Drage, Fiona Mann and Ian Michael in the Autumn 1998 issue of the *FSR*.

3 Abbey National, Bank of Scotland, Barclays, Lloyds-TSB, Midland, NatWest, Royal Bank of Scotland and Standard Chartered. Data are reported on a risk-transfer adjusted basis ie after allowing for loan guarantees etc Data for Midland are estimated from its published accounts.

4 Eastern Europe, developing Asia, Latin America, Africa and the Middle East.

5 The Bank for International Settlements area comprises Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Norway, Sweden, Switzerland, UK, Canada, Japan and USA.

6 Brazil is planning to introduce a monetary framework based on an inflation target. Together with the IMF and other central banks, Bank staff recently participated in a Brazilian conference on the theory and practice of inflation targeting in a Brazilian context.

7 Refers to the 37 developing country members of the Asian Development Bank.

8 "Is Asia's Recovery Sustainable" in *Global Emerging Markets-Asia* May 1999, Deutsche Bank.

9 GITIC, Guangdong International Trust and Investment Corporation, is one of many investment companies set up by provincial governments to attract foreign investment.

10 A separate article by Glenn Hoggarth and Joe Thomas in this Review discusses the official measures to recapitalise banks in more detail and considers whether financial restructuring could potentially contribute to stimulating growth through increased lending for investment. That question is difficult to resolve, but the banking system should now be more robust.

11 Abbey National, Bank of Scotland, Barclays, Lloyds-TSB, NatWest, Royal Bank of Scotland and Standard Chartered. Data are reported on a risk-adjusted basis i.e. after allowing for loan guarantees etc. Data for Midland are not available.

12 Based on the Irish Permanent Index.

13 Using data available from 1992, it appears that the skewness of expectations about the FTSE 100 peaked during the market turbulence last year, but still remains fairly high. However, a longer run of data would be necessary to be confident that the perceived risk of a large fall is significantly higher now than the long-term average. See Bahra B (1996): "Probability Distributions of Future Asset Prices Implied by Option Prices *"Bank of England Quarterly Bulletin*, August.

14 Source: Capital DATA Bondware and Loanware. International bonds including corporates, supranationals and sovereign issuers.

15 In its April 1999 report on "Hedge Funds, Leverage, and the Lessons of Long-Term Capital Management", the President's Working Group on Financial Markets said "The central public policy issue raised by the LTCM episode is how to constrain excessive leverage more effectively".

16 According to the BIS's triennial survey, published on 10 May 1999, turnover in OTC derivatives rose from US$880bn in April 1995 to £1,265bn in April 1998, much faster than the growth in exchange-trade derivatives. Around 35 per cent of this activity was in London, up from 30 per cent in 1995. The notional amount of outstanding derivatives contracts was US$73 trillion at end-June 1998, reflecting growth of 15 per cent pa since March 1995. Interest-rate derivatives grew at about 19 per cent pa to US$48 trillion; foreign exchange contracts by 8 per cent pa to US$22 trillion. The gross market value of interest-rate derivatives was US$1.354bn (2.8 per cent of the notional amount) compared with US$647bn at end-March 1995 (2.4 per cent of notional). The gross market value of foreign exchange derivatives was lower in June 1998 (US$982bn, 4.5 per cent of notional) than in March 1995 (US$1,048bn, 8.0 per cent of notional). See "Central Bank Survey for Foreign Exchange and Derivatives Market Activity 1998" published by the BIS.

17 See "Banks' Interactions with Highly Leveraged Institutions" and "Sound Practices for Banks' Interactions with Highly Leveraged Institutions", Basel Committee on Banking Supervision, BIS, January 1999.

18 See Hoggarth G and Chrystal K A (1998): "The UK Personal Sector During the 1980s and 1990s: a Comparison of Key Financial Indicators", Bank of England Quarterly Bulletin Vol 38, No 3 (August) for a more comprehensive comparison of key financial indicators in the personal and corporate sectors during the 1980s and 1990s.

19 Z-scores are a numerical credit-scoring technique based on statistical models of business failures, originally pioneered by Altman. See Altman,E.I.(1968): "Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy", *Journal of Finance*, Vol.23, September.

20 Source: IPD (Investment Property Database).

21 Abbey National, Barclays, Midland, Lloyds-TSB, NatWest, Royal Bank of Scotland, Bank of Scotland, Alliance & Leicester, Halifax and Woolwich.

22 Total regulatory capital divided by total risk-weighted assets.

23 See also Bank of England (1998-9): "Financial Sector Preparations for the Year 2000", various issues (the latest, Issue 4, was published in March).

24 The EU Commission recently announced proposals to prepare a follow-up Directive, which is expected to provide a more extensive clarification of the law governing transactions that involve the taking of collateral security. That should give market participants greater certainty about the risks to which they are exposed in their trading activities and potentially make an important contribution to financial stability in Europe.

NB This survey is based on data available as of 28 May 1999.

Improving the stability of the international financial system

John Drage, International Finance Division, and Fiona Mann, Regulatory Policy Division, Bank of England (together with other Financial Stability colleagues).

An article in the previous *Financial Stability Review* outlined the financial and economic background to some of the issues under discussion on strengthening the "international financial architecture". The debate was stimulated partly by the financial crises in a number of emerging market countries over the previous two years: crises which revealed serious flaws in macroeconomic management but also, just as important, in the structure and regulation of financial markets in both debtor and creditor countries. This article provides an overview of the work undertaken by the international community since the last *FSR*.

THE ARTICLE surveys recent developments under three headings: crisis prevention, including the development of good practice standards and transparency codes, and incentives for both borrowers and lenders to act prudently; crisis containment, including the establishment of official contingent credit lines and possible forms of private sector finance which may reduce the severity of any crisis; and crisis resolution, where the emphasis is on possible ways of creating a more orderly environment for restructuring external debt, on principles to guide the restructuring of banking systems in the wake of a crisis, and on handling corporate insolvency[1].

Much of this work has followed the plan presented by the G7 Finance Ministers to their Heads of Government in December 1998; Annex 1 summarises progress on 35 action points[2]. In support of this work programme, at their meeting on 20 February 1999, G7 Finance Ministers and Central Bank Governors endorsed the creation of a Financial Stability Forum. This brings together the finance ministries, central banks and principal regulatory agencies of the G7 countries, the IMF, the World Bank, the BIS, the OECD, the BCBS[3], IOSCO, IAIS, CGFS[3] and CPSS[3] (see glossary at the end of the article for definitions). Its purpose is to assess issues and vulnerabilities affecting the global financial system and to identify and oversee the actions needed to address them. At its first meeting on 14 April the Forum set up three working groups: on highly leveraged institutions; on capital flows; and on offshore financial centres[4].

CRISIS PREVENTION

I Overview

The crises of the past two years have demonstrated that robust market and institutional structures, in addition to sustainable, stability-orientated macroeconomic policies, are pre-conditions for long-run national economic development, for successful integration of countries into the world economic and financial system, and for building a more stable international financial system. In a world of integrated financial markets, domestic instability can spill over into international financial instability. There have been lessons about the implications of a country's choice of exchange rate regime; the importance of prudent debt structures; and the need to ensure robust financial and corporate sectors, and professional regulatory systems. Considerable effort has already been devoted to developing a number of internationally agreed codes and standards of good practice, covering macroeconomic management and policies promoting a strong financial system and corporate sector. Sections II to IV discuss this work.

If codes and standards are to contribute to improving stability, there will need to be strong incentives for their adoption and implementation. This issue, including the potential role of IMF Transparency Reports, is discussed in section V. In section VI the focus shifts from measures and incentives aimed primarily at debtor countries to measures designed to strengthen financial practices in developed countries.

II Improving macroeconomic and financial policies

Exchange rate regimes

One common characteristic of the main crises of the past two years — Thailand, Indonesia, Korea, Russia and Brazil — has been that the authorities had adopted a more or less rigid exchange rate regime that, ultimately, proved unsustainable. One clear lesson seems to be that, in most circumstances, once a weak peg comes under fire, defending it is often a losing battle. Robert Rubin, the former US Treasury Secretary, has suggested[5] that, in future, the international community should generally not provide large scale official finance to countries intervening heavily to defend an exchange rate peg, except when loss of the peg might pose systemic threats to the international financial system.

More generally, there has been debate about whether effectively fixing an exchange rate requires (at least) a currency board structure. For fixing to be successful the authorities must be must be prepared to subordinate other policy goals to that of maintaining the peg. Currency boards are a way of institutionalising this policy subordination. They impose tough disciplines. The domestic currency must be backed at least one-for-one by foreign assets. Monetary policy is effectively delegated to the anchor currency authority. And banking supervision must be directed at ensuring a robust, liquid financial system, given the lack of a conventional domestic currency lender of last resort.

However, recent events do not lead inexorably to the conclusion that the only viable exchange rate regimes for an emerging market country, in all circumstances and at all times, are a free float on the one hand, or a currency board or monetary union on the other. As a matter of theory, the optimal degree of exchange rate flexibility depends on a country's policy preferences; its institutional capability (eg whether it can establish a credible domestic monetary authority); the underlying structure of the macroeconomy (for example, the degree of price flexibility and the degree of capital mobility); and on the nature of the shocks affecting the economy (for example, external versus domestic, or monetary versus real). The greater a country's inflation resolve (but the weaker the credibility of its

domestic monetary institutions), the greater its degree of price flexibility and the lower its degree of capital mobility, and the greater its susceptibility to nominal shocks, the greater are the attractions of a fixed exchange rate regime. This explains the attraction of fixed pegs for some countries in the early stages of development, when these characteristics are often prevalent.

If policy preferences, macroeconomic structures and the pattern of shocks change as an economy develops, so too can the optimal exchange rate regime. For example, if inflation falls and/or prices become stickier, the advantages of a pegged exchange rate might decrease, as might its sustainability. In those circumstances, a key question is the appropriate "exit strategy" from a managed exchange rate regime. In principle one option would be to jump straight to a free float. Many countries have effectively been forced along that path by exchange market pressures. But recent experience in, for example, Poland and Israel suggests that a progressive widening in an exchange rate band can in certain circumstances be a viable alternative. The ultimate destination for some emerging market economies may indeed be either a free float or some form of currency union — as in the majority of developed countries today — but along the transitional path, regimes with intermediate degrees of exchange rate flexibility could potentially prove a useful device in delivering policy objectives. The crucial thing is for a country to recognise — and explain to households, businesses and the financial sector — the disciplines entailed by whatever regime it chooses.

Prudent debt structures and liquidity management

A striking lesson of the past few years is that the stability of a regime can depend upon the structure of an economy's debt, in particular the amount of short-term foreign currency debt incurred by the government, other public sector bodies, banks and the corporate sector relative to liquid assets. The aggregate amount of net short-term foreign currency debt built up by many countries was often not realised until after crises had broken and capital outflows had increased; the extent of the volatility of short-term capital flows was discussed on pages 69 to 72 of the article in the previous FSR.

The recent crises have, amongst other things, highlighted the need for countries to monitor and manage the level of short-term debt in relation to the level of their foreign exchange reserves and the foreign currency liquidity of their banking systems[6]. Countries with pegged exchange rates probably need to aim for a lower level of short-term foreign currency debt relative to the level of foreign currency reserves than countries with more flexible exchange rate arrangements. Alan Greenspan (Chairman of the US Federal Reserve) has recently suggested[7] that emerging market countries should aim to hold a minimum level of reserves sufficient to cover 12 months of debt servicing and repayment; and to ensure that the average maturity of debt exceeds, say, three years. If a country found it could not borrow in longer term markets, that would indicate that policy actions to correct economic imbalances were required.

Another lesson is the need to monitor and control the scale of put options on debt issues, since their exercise shortens the effective maturity of the debt and so can put pressure on liquidity. The IMF has recently highlighted[8] the large volume of such options issued by sovereigns and other borrowers in some countries.

The IMF is also paying increasing attention to the related issue of the foreign currency liquidity position of countries' banking systems and is involved in helping a number of countries develop monitoring systems. Supervisory agencies in emerging market countries are being encouraged to focus on the extent of foreign exchange liquidity mismatches being run by their banks.

The general area of prudent debt and liquidity management by governments, banks and corporates is something which the working party on capital flows established by the recently created Financial Stability Forum might explore[10].

Good practice standards and transparency codes

The International Monetary Fund (IMF) has already developed codes covering the compilation and publication of key macro-economic and financial data (the General and Special Data Dissemination Standards). In addition, preparation of codes on fiscal transparency and monetary and financial policy transparency is well advanced.

As already stressed, pursuing and monitoring prudent external and internal debt management policies requires timely data. The IMF Executive Board's agreement to strengthen its **Special Data Dissemination Standard**[11] is therefore welcome. Countries that subscribe to the SDDS will in future be required to provide detailed information not only on reserve assets but also on reserve-related liabilities and other potential drains on reserves, such as derivatives positions and guarantees extended by the government for private sector borrowing in foreign currency; details are set out in Annex 2. The initial requirement is for countries to provide the information monthly with a maximum lag prior to publication of one month, while continuing to provide data on total reserve

assets monthly with a lag of no more than a week. Countries are being encouraged to move towards publishing the full data template on a weekly basis with a maximum lag of a week. Encouraging countries to provide more timely and comprehensive information on international reserves should help to promote better informed decision-making in both the public and private sectors and thereby improve the functioning of global financial markets.

Debt structures are of course affected by fiscal policies. The rationale of the **Code of Good Practice on Fiscal Transparency** is that providing better information to the public will make governments more accountable and thereby strengthen the credibility and public understanding of macroeconomic policies and of choices about the design and results of fiscal policy. The principles on which the Code is based were set out on page 79 of the last edition of the Financial Stability Review. Since then, the IMF has finalised a manual to assist countries in implementing the Code. It has also prepared a questionnaire for assessing the transparency of a country's fiscal management system against the requirements of the Code; and a model self-evaluation report, which is intended to highlight strengths and weaknesses of current systems, and to point to areas where improvements could be made[12].

The benefits of transparency extend to other areas of macroeconomic policy, most obviously monetary policy. Over the past six months the IMF has worked with the Bank for International Settlements (BIS), a representative group of central banks, the World Bank, some non-central bank regulatory agencies, and some academics to prepare a draft **Code of Good Practices on Transparency in Monetary and Financial Policies**[13]. The draft, which is currently out for public consultation, identifies practices that would enhance the transparency of the institution (normally a central bank) responsible for the conduct of monetary policy; and practices that would enhance the transparency of policies followed by the agencies responsible for the promotion of financial stability, including regulation, supervision and oversight of payment systems (collectively described in the Code as "financial policies"). Some of the main features of the draft Code are outlined in Box 1.

There is a twofold rationale for this Code. First, the effectiveness of monetary and financial policies can be strengthened if the goals and instruments of policy are known to the public and if the authorities can make a credible commitment to meeting them. Secondly, good governance calls for central banks and other financial agencies to be accountable, particularly where they are granted a high degree of autonomy. Transparency can also improve performance by enhancing incentives.

III Strengthening debtor country financial systems

As the previous section has underlined, a sound macroeconomic environment, domestically and internationally, requires a robust financial sector. Recent crises demonstrated the economic damage that can arise when a weak banking system is the dominant — in some cases virtually the sole — channel of financial intermediation in an economy. This creates a need both to strengthen banking systems and prudential regulation, and to promote the development of other financial intermediaries and markets.

Promoting the development of domestic capital markets

If domestic financial markets are poorly developed, savings may be intermediated in offshore markets, and firms may have to borrow externally, in foreign currency, to finance investment. This can contribute to the incidence of domestic capital flight, and to the accumulation of a sub-optimal debt structure for the economy as a whole. Developing active domestic capital markets, trading instruments denominated in the local currency, could therefore in principle contribute to building a more robust financial system.

The World Bank (particularly through the IFC[14]) and a number of regional development banks have programmes to assist countries with the infrastructure required to support the development of capital markets in emerging market countries. However, even with well-developed local capital markets, banks are likely to remain the dominant financial intermediaries in many countries for the foreseeable future. A *sine qua non* for a robust financial system will therefore remain a strong banking system.

Banking sector and macro-economic stability

The links between banking sector stability and macroeconomic stability can work in both directions. In many cases, macroeconomic shocks (currency crises, accompanying interest rate shocks, and commodity price collapses) have an adverse effect on bank customers and loan quality. But in other instances — as was the case in a number of Asian countries — imprudent borrowing and lending by banks can themselves contribute to an external sector crisis. Moreover, banking system weakness can impede the ability of the authorities to implement policy corrections; and attempts to prop up the banking sector can in turn involve significant fiscal costs (as discussed in section XIV).

Box 1 Main features of the Draft Code of Good Practices on Transparency in Monetary and Financial Policies

The Draft Code identifies desirable transparency practices for central banks in their conduct of monetary policy, and for central banks and other financial agencies in their conduct of financial policies. This Box summarises the Draft Code's main provisions, under the following four headings:

1. Clarity of roles, responsibilities and objectives of central banks and financial agencies;

2. Processes for formulating and reporting of monetary policy decisions by the central bank, and of financial policies by financial agencies;

3. Public availability of information on monetary and financial policies;

4. Accountability and assurances of integrity by the central bank and financial agencies.

Good Transparency Practices for Monetary Policy

Clarity of Roles, Responsibilities and Objectives of Central Banks for Monetary Policy

- The ultimate objective(s) and institutional framework of monetary policy should be clearly defined in relevant legislation or regulation, including, where appropriate, a central bank law.

- The institutional relationship between monetary and fiscal operations and agency roles performed by the central bank on behalf of the government should be clearly defined.

Open Process

- The framework, instruments, and any targets that are used to pursue the objectives of monetary policy should be described, explained, and publicly disclosed.

- Where a permanent monetary policy making body meets to assess underlying economic developments, monitor progress toward achieving its monetary policy objective(s), and formulate policy for the period ahead, information on the composition, structure, and functions of that body should be available to the public.

- Changes in the setting of monetary policy instruments (other than fine-tuning measures) should be publicly announced and explained in a timely manner.

- The central bank should issue periodic public statements on progress toward achieving its monetary policy objective(s) as well as prospects for achieving them. The arrangements could differ depending on the monetary policy framework, including the exchange rate regime.

- For proposed substantive technical changes to the structure of monetary regulations, there should be a presumption in favour of public consultations, within an appropriate period.

- The regulations on data reporting by financial institutions to the central bank for monetary policy purposes should be publicly disclosed.

Public Availability of Information on Monetary Policy

- Presentations and releases of central bank data should meet the standards related to coverage, periodicity, timeliness of data and access by the public that are consistent with the International Monetary Fund's data dissemination standards.

- The central bank should release its balance sheet on a preannounced schedule, and provide the public after a predetermined interval with selected information on its aggregate market transactions.

- Consistent with confidentiality, information on emergency financial support by the central bank should be reported through the bank's balance sheet when such disclosure will not be disruptive to financial stability.

- The central bank should establish and maintain public information services.

- Texts of regulations issued by the central bank should be readily available to the public.

Accountability and Assurances of Integrity

- Officials of the central bank should be available to appear before a designated public authority to report on the conduct of monetary policy, explain the policy objective(s) of their institution, describe their performance in achieving their objective(s), and, as

appropriate, exchange views on the state of the economy and the financial system.

- The central bank should prepare and publish audited financial statements of its operations on a preannounced schedule, and information on the expenses and revenues in operating the central bank should be made available to the public annually.

- Standards for the conduct of personal financial affairs of officials and staff of the central bank and rules to prevent exploitation of conflicts of interest, including any general fiduciary obligation, should be publicly disclosed.

Good Transparency Practices for Financial Policies

Clarity of Roles, Responsibilities and Objectives of Financial Agencies

- The broad objective(s) and institutional framework of financial agencies should be clearly defined, preferably in relevant legislation or regulation.

- The relationship between financial agencies, and the role of oversight agencies with regard to payment systems, should be publicly disclosed.

- Where financial agencies have oversight responsibilities for self-regulatory organisations, the relationship between them should be publicly disclosed.

- Where self-regulatory organisations are authorised to perform part of the regulatory and supervisory process, they should be guided by the same good transparency practices specified for financial agencies.

Open Process for Formulating and Reporting of Financial Policies

- The conduct of policies by financial agencies should be transparent, compatible with confidentiality considerations and the need to preserve the effectiveness of actions by regulatory and oversight agencies.

- Significant changes in financial policies should be publicly announced and explained in a timely manner. For proposed substantive technical changes to the structure of financial regulations, there should be a presumption in favour of public consultations, within an appropriate period.

- Financial agencies should issue periodic public reports on how their overall policy objectives are being pursued.

Public Availability of Information on Financial Policies

- Financial agencies should provide the public with a periodic report on the major developments of the sector(s) of the financial system for which they carry designated responsibility.

- Financial agencies should seek to ensure that, consistent with confidentiality requirements, there is public reporting of aggregate data related to their jurisdictional responsibilities on a timely and regular basis.

- Where applicable, financial agencies should release their balance sheets on a preannounced schedule and provide the public after a predetermined interval with information on aggregate market transactions.

- Consistent with commercial confidentiality, aggregate information on emergency financial support by financial agencies that provide such support should be reported through the agencies' balance sheets when such disclosure will not be disruptive to financial stability.

- Financial agencies should establish and maintain public information services, with texts of regulations and any other generally applicable directives and guidelines issued by financial agencies readily available to the public.

- Where there are deposit insurance guarantees, policy-holder guarantees, and any other client asset protection schemes, information on the nature and form of such protections, on the operating procedures, on how the guarantee is financed, and on the performance of the arrangement, should be publicly disclosed.

- Where financial agencies oversee consumer protection arrangements (such as dispute settlement processes), information on such arrangements should be readily available to the public.

Accountability and Assurances of Integrity by Financial Agencies

- Officials of financial agencies should be available to appear before a designated public authority to report

on the conduct of financial policies, explain the policy objective(s) of their institution, describe their performance in pursuing their objective(s), and, as appropriate, exchange views on the state of the financial system.

- Where applicable, financial agencies should prepare and publish audited financial statements of their operations on a preannounced schedule and information on the operating expenses and revenues of financial agencies should be made available to the public annually.

- Standards for the conduct of personal financial affairs of officials and staff of financial agencies and rules to prevent exploitation of conflicts of interest, including any general fiduciary obligation, should be publicly disclosed.

Strengthening banking systems involves avoiding some policies and positive action to pursue others. It is important to avoid policies which create material inefficiencies or moral hazard, such as government guidance on bank lending policies and explicit or implicit guarantees of bank soundness. The perception that banks in some Asian countries would not be allowed to fail made financing too cheap, and exacerbated the accumulation of dangerous debt structures, thereby increasing the risk of a self-fulfilling crisis.

Core principles for effective banking supervision

Positive steps are also needed, particularly if a country is contemplating liberalising its financial system. The international community has a number of exercises underway. The transparency code on financial policies, discussed in the previous section, is part of this effort. Another key exercise has been the development and promotion of the Basel Committee's Core Principles for Effective Banking Supervision[15]. Since being published in September 1997, these Principles have received wide endorsement around the world as providing a basic blueprint for banking supervisory systems and practices. Both the International Organisation of Securities Commissioners and the International Association of Insurance Supervisors have also produced their own sets of principles and standards covering securities supervision[16] and insurance supervision[17] respectively.

The Basel Committee has been active in encouraging the implementation of its Core Principles beyond the G10 area and in soliciting views on how to enhance them. It has created a Core Principles Liaison group, involving supervisors from emerging markets and the IMF and World Bank as well as Basel Committee members, which meets regularly to assess progress in implementing the Principles and lessons learned. It is also working with the IMF and World Bank to develop an approach to assessing compliance, by identifying in further detail the key features of sound regulatory processes and structures. The IMF and World Bank are likely to bear most of the responsibility for assessing financial systems; the Basel Committee itself will remain a standard setting body, although individual Committee members may of course offer the help of experienced staff to the Fund and World Bank to assist in their work — both FSA and the Bank of England plan to do so.

Emerging market economy supervisors have helped to identify areas where the Core Principles, even as amplified by the longer supporting documents, do not offer enough detailed guidance. Such areas include the need for supervisors to consider applying higher minimum capital standards to banks operating in volatile regions, the need for further consideration of sound practices for foreign currency liquidity management (as discussed in the previous section), and the need for clear standards on loan valuation and accounting procedures. Without sound loan valuation and provisioning practices, there can be no confidence about the adequacy of bank capital to absorb losses, even if banks are, on paper, meeting the minimum 8 per cent international capital adequacy requirement. Whilst accounting standards are largely the responsibility of the IASC and national accounting standard-setters, the Basel Committee has published a draft paper setting out guidance on sound practice in the valuation of bank loans and determining of provisions.

Core principles for payment systems

Another important aspect of developing a strong financial system is the robustness of a country's payment system. The G10 Committee on Payment and Settlement Systems has set up a task force with a wide membership (drawn from 23 central banks at varying stages of economic development plus the IMF and World Bank) to develop a set of Core Principles for Payment Systems. These will cover many aspects of payment system design, operation, participation and oversight, with particular emphasis on reducing risk (particularly systemic risk) and promoting payment system efficiency. The Core Principles are likely to

address transparency issues, and thus should help payment system oversight authorities to implement those parts of the draft IMF transparency code for financial policies (see Section II) that apply to payment systems.

Technical assistance

The high priority now being given to strengthening the financial system by many countries has led to an increase in demand for technical assistance covering design and implementation. While supervisory advice has been a long-standing feature of multilateral programmes or missions, recent years have seen a steep increase in advice and training in this area. Reflecting this, two new institutes dedicated to strengthening financial systems through improving supervision have recently been established — the Basel Financial Stability Institute, and the Toronto International Leadership Centre for Financial Sector Supervision. These institutes will complement existing sources of advice and training, which include IMF missions, World Bank projects, regional programmes (such as the European Commission's programmes aimed at the former Soviet Union and other central and eastern European countries), and bilateral assistance from individual supervisory agencies, central banks or governments[18]. In many cases assistance programmes make use of private sector expertise involving practitioners or consultants.

IV Strengthening the corporate sector

The recent Asian crises revealed serious weaknesses in the corporate sector. These were in part due to companies having acted on the mistaken assumption that their governments would succeed in maintaining a pegged exchange rate, and in consequence having borrowed in foreign currencies to take advantage of lower interest rates (compared with domestic rates). When the exchange rate weakened, companies scrambled to cover their foreign currency exposure, which had the effect of driving the exchange rate lower still, further increasing the size of their liabilities in local currency terms, and making many companies insolvent. However, there is also evidence that many companies were increasing their leverage at a time when profitability was declining, making them highly vulnerable to any change in sentiment. There seem to have been failures of risk management and control.

Corporate governance

The mobilisation and channelling of savings into productive investment is fundamental for economic development. Savers need to be confident that the companies in which they invest will act in their interests, protecting their investment and seeking to generate an adequate rate of return. Good corporate governance, which should cover risk management, is therefore a crucial underpinning of safe and sound markets.

Systems of corporate governance vary widely, not only between developed and developing countries but also between leading developed countries, which makes a single detailed set of international corporate governance standards unlikely, at least in the near future. However, there is a growing consensus on the objectives and key principles of good systems of corporate governance. The OECD has produced principles targeted primarily at publicly listed companies in its member countries. These are summarised in Box 2[19]. The World Bank is preparing a paper which aims to complement the OECD's work. It will focus on the specific issues and challenges that arise in fostering effective corporate governance in developing economies, and highlight the principles that can assist reform.

Accounting and auditing standards

In addition to deficiencies in corporate governance, the crises of the past two years highlighted a lack of transparency in accounting and auditing standards in a number of countries, which reduced the reliability of the available financial information. International codes aimed at improving accounting and auditing standards have a significant role to play in constructing a more stable international financial system. The International Accounting Standards Committee issues accounting standards for the private sector and recently completed the last in a series of core accounting standards that could be used for cross-border offerings and listings in global markets[20]. There is now a need for the international community to develop a strategy both to encourage countries to implement the IASC standards and also to monitor their implementation.

In parallel, the International Auditing Practices Committee (IAPC) of the International Federation of Accountants (IFAC) has formulated international standards on auditing and audit practice statements[21]. The majority of IFAC member countries use these international standards as a basis for their own national standards. While IFAC standards have no legal force, IFAC encourages its members to evaluate how well their domestic auditing practices compare with the international standards. Again there is a need for the international community to develop a system to monitor the extent of compliance with IFAC's auditing standards.

The problems and measures described in this section are relevant to the make up and pattern of capital flows, and

Box 2 Summary of OECD Principles of Corporate Governance

The OECD Principles of Corporate Governance are intended to assist member and non-member governments in their efforts to evaluate and improve their own legal, institutional and regulatory framework for corporate governance, rather than to provide a prescription for national legislation or regulation. They have been grouped under five headings, which are listed below along with the underlying reasoning:

The rights of shareholders

- Basic shareholder rights should be protected. These include the rights to: share in profits; vote on appropriate issues; transfer shares; access relevant and timely information; and have secure registration of ownership.
- Capital structures that allow certain shareholders to obtain a disproportionate degree of control should be disclosed.
- The market for corporate control should be allowed to function efficiently, transparently and in a manner that is fair for all shareholders.

The equitable treatment of shareholders

- All shareholders of the same class should be treated equally, including minority and foreign shareholders and those with shares held by custodians or nominees.
- Self-dealing and insider trading should be prohibited.
- Members of the board and managers should be required to disclose material interests in transactions or matters affecting the corporation.

The role of stakeholders in corporate governance

- The rights of stakeholders, as established by law, should be respected and there should be effective redress when these rights are violated.
- Where stakeholders do participate in the corporate governance process, they should have access to relevant information.

Disclosure and transparency

- There should be timely and accurate disclosure of information on all material matters regarding the financial situation, performance, ownership and governance of the company. Information channels should be cost-effective for users.
- Information should be prepared, audited and disclosed in accordance with high quality standards.
- To provide an objective and external control over the disclosure of financial information, an independent auditor should conduct an annual audit.

The role of the board

- The corporate governance framework should ensure strategic guidance and effective monitoring of the company by the board (the OECD includes a list of key functions that the board should fulfil) and the board's accountability to the company and the shareholders.
- Board members should have access to accurate, relevant and timely information.
- Where board decisions may affect various shareholder groups differently, the board should treat all shareholders fairly.
- The board should ensure compliance with applicable law and take into account the interests of stakeholders.
- The board should be able to exercise objective judgement on corporate matters, independent of management. The appointment of independent non-executive directors should be considered.

the resulting structure of the stock of external and internal liabilities. In practice, foreign direct investment can potentially reduce a country's exposure to abrupt capital flight, but minority (and majority) investment will be discouraged by weak corporate governance and by uncertain or inadequate insolvency regimes (see Section XV). Strengthening the environment in which the corporate sector operates can therefore contribute to macro stability.

V Incentives for countries to implement internationally agreed codes and standards

Many of the measures or exercises described so far are based on the development of codes and standards. They will contribute towards improving stability only if countries actually adopt and implement them. A crucial ingredient in achieving this is genuinely to involve emerging market countries in their development. Another ingredient is straightforward and open assessments of

progress. That is why, in their declaration of October 1998[22], the G7 Finance Ministers and Central Bank Governors endorsed the recommendation of the G-22 Working Group on Transparency and Accountability[23] that the IMF should prepare, for each member country, a transparency report which summarised the degree to which it met internationally recognised standards.

The IMF has already embarked on a pilot programme of producing and publishing transparency reports, focusing in particular on the degree to which a country meets standards related to disclosure and accountability. The first two reports on Argentina and the UK, along with Australia's self-assessment report, were published on April 22[24]. These reports need to be based on expert assessments. To aid that, the Chancellor of the Exchequer has recently proposed the creation of a new unit within the IMF, which would draw on the expertise of a wide range of organisations, to take forward work on monitoring compliance with all internationally agreed codes and standards[25].

Other incentives could be based on linking progress to regulatory capital requirements (as described in the next section), or to the availability or terms of IFI assistance. For example, it has already been agreed that the IMF Board will take into account the extent of compliance with codes and standards when making judgments about a country's eligibility for access to the IMF's newly-agreed Contingent Credit Line (discussed in Section VIII below), and it is already common for financial sector reform to be a key element of an IMF adjustment programme. Similarly, the World Bank, or the Regional Development Banks, could provide technical assistance loans to support a country's implementation efforts. But the biggest incentive should be the contribution that reform could make to the availability and terms of private sector finance; and to protecting against crises and the painful social costs they bring.

VI Promoting prudent financial practices in developed countries

Recent crises also highlighted inadequacy of risk analysis and management control by some investors and lenders. Improvement should be aided by the increased information about countries which implement the various codes and standards described above, since that should help investors and lenders to make better informed decisions, and to set the terms of credit appropriately. But measures directly aimed at improving creditor practices and at strengthening prudential supervision are also needed.

Supervision of financial conglomerates

Maintaining effective risk controls is particularly important in large complex financial groups, which in the recent crises had exposures directly to EMEs and indirectly to other financial institutions, such as hedge funds, active in EME financial markets. A strong regulatory regime needs to be able to cope with the supervision of these complex businesses. In February, the Basel Committee, IOSCO and IAIS — the "Joint Forum" — published recommendations on the supervision of financial conglomerates, addressing issues such as techniques for calculating capital adequacy of conglomerates and principles for exchange of information amongst supervisors.

The Basel Accord

Another important development is the current revision of the international framework for capital adequacy (the Basel Accord). A major objective in revising the Accord is to make it more risk-based. Improving regulatory incentives for banks to reflect their risks more accurately in the pricing and other terms of loans should, in turn, influence borrower behaviour.

The Basel Committee on Banking Supervision published a consultative paper outlining the planned shape of reform on June 3[26]. Many of the changes being considered are still in the early stages of development. A comprehensive account of the new framework is outside the scope of this article, but aspects of particular relevance to financial stability — including to the terms of flows to emerging market economy borrowers — include the following:

(i) Borrower risk weights

The consultative paper proposes a number of amendments to the current, very simple classification of borrower credit risks. At present there is limited differentiation of risk — for example all corporate loans carry the same weight (100 per cent). And where the current classification does distinguish between classes of borrower, the basis and extent is sometimes questionable — for example the step from a 0 per cent weighting (zero capital cover) on foreign currency lending to all OECD member countries to a 100 per cent weight (8 per cent minimum capital cover) for non-OECD sovereigns.

The Basel Committee has identified two possible ways of addressing this. One possible approach, likely to be applied only to 'sophisticated' banks, would use banks' internal loan gradings as a basis for differentiating between risks on different borrowers. This route has a number of attractions, not least that it could substantially reduce the scope for distortion of credit decisions arising from broadbrush

Box 3 Impact of the Basel Risk Weights on the Maturity Of Bank Loans to Emerging Market Economies

A number of the studies on the Asian crises have highlighted the build up of short-dated external liabilities in these countries' economies as one of the factors that increased their vulnerability to shocks. This box summarises work undertaken in the Bank to investigate whether the structure of the Basel Capital Accord distorted the maturity pattern of G10 banks' loans to these countries, increasing the proportion of lending that was short-term and thereby making them more fragile.

The current risk weighting framework divides sovereigns into two categories — those which are members of the OECD or which have a General Agreement to Borrow Arrangement with the IMF ('Zone A'), and those which are not in this category ('Zone B'). Lending to banks which are incorporated in Zone A receives a 20 per cent risk weighting, regardless of maturity, whilst lending to banks in Zone B receives this weighting only if the maturity is less than one year. Longer term lending to Zone B banks is weighted at 100 per cent, ie a five-fold increase in required capital.

The substantial jump in the capital requirement on Zone B loans of over one year may have discouraged longer term lending. The other possibility is that the low weight on interbank lending may have encouraged more funding to flow through this channel rather than direct, and longer term, to the industrial sector.

The issue of the maturity of lending was looked at in two ways. In the first approach countries were grouped together if they were perceived by the market to be of similar quality (as evidenced by their ratings) but were in different Zones. If the extra capital needed for interbank loans of over a year's maturity to Zone B banks is important, a higher proportion of the loans they receive should be under one year. Data were not available on just interbank loans, so the BIS data that pertains to the maturity of lending to the whole economy was used as the nearest approximation. The pool of comparably rated countries was fairly small, owing in part to short ratings histories for many Zone B countries. Nevertheless, on this test, the evidence appeared to indicate that there may be a distortion in lending patterns to highly rated Zone B countries. Further down the ratings scale the evidence was more mixed.

What happened to the maturity of lending flows to a country that switched status was also investigated. At the time of conducting the exercise, four countries had become members of Zone A since the implementation of the Accord: Mexico, the Czech Republic, Hungary and South Korea. A simple regression was run that sought to explain the proportion of G10 banks' lending to each of the four countries that was under one year's maturity. The independent variables were contemporaneous and lagged values of the share of BIS banks' loans under one year in maturity to all countries outside the BIS area (to control for any generalised change in the maturity of lending induced perhaps by yield curve considerations), the share of BIS banks' lending to the country that was directed at the banking sector (to control for the effect that a change in the share of interbank lending might have on overall maturity), and a lagged dependent and a dummy variable. The latter took the value one in periods after the country gained Zone A status and zero before this event.

As the length of time it would take BIS banks to adjust the maturity of their lending flows to a country's switch between Zone A and B is not known, the regressions were repeated with dummies entered six and 12 months after the change. The regressions were run with sub-one year lending calculated on an original and residual maturity basis, and repeated with under one year lending being expressed as a proportion of under two year lending (rather than total).

The focus of attention in the regressions was the coefficient of the dummy variable. If this was negative and statistically significant it would be consistent with Zone A membership having an impact on the maturity structure of BIS banks' lending to that country. An effect was present in half the regressions run for Mexico, and for South Korea when the dummy was entered immediately after Zone A membership. Unfortunately, Zone A membership for these two countries coincided closely with currency crises, making interpretation of the effect difficult. Clearly this test suffered from the very small number of examples of Zone A/B switches.

The evidence was therefore not conclusive, but some of it lent support to the commonsense proposition that a five-fold increase in regulatory capital would be likely to be a factor in lender and borrower behaviour.

regulatory capital requirements. It would also mirror the treatment of market risk in the trading book, where more sophisticated banks are allowed to use internal systems for establishing capital requirements. However, there are a number of practical problems to be overcome before internal loan gradings could be used, such as how to ensure comparability across banks and effective policing by regulators to guard against banks "improving" loan grading when their capital resources were stretched; that would be ill-judged for a bank, but it is a risk. A great deal of work remains to be done on how to implement this option; the Basel Committee is taking this forward.

The second route would amend the 'standardised' schedule of risk weights. New schedules of weights are proposed for sovereigns, banks, and (to a more limited extent) corporates. These would all be based on external credit categorisations, of which the principal current source is ratings agencies.

Use of ratings should in principle provide a less arbitrary and crude way of differentiating risk weightings than the current system. Ratings also have the virtue of being reasonably widely available — certainly for sovereigns. Again, this is an approach which has already been adopted in the trading book. However, the track record of ratings agencies is not unblemished, and the ratings history is rather short for some borrowers, eg, lower quality sovereigns. This means that some assurance as to the soundness and objectivity of the ratings process would be desirable if ratings are to be used extensively in the setting of regulatory capital. This will be even more important if the new Accord has the effect of creating incentives for the establishment of new rating agencies, particularly in those countries where relatively few corporates currently have a public rating.

One particular issue associated with the use of ratings is whether it could exacerbate withdrawal of lines from countries as they get downgraded. This may to some extent be an inevitable consequence of making capital weights more sensitive to risk. Banks already increase provisions and limit exposures in situations where countries are in clear difficulties. The advantage of using ratings as a basis for capital is that they might provide a better indication of risk at the outset of the loan, and also track deterioration in creditworthiness. This might help to limit excessive, or under-priced, lending to high risk borrowers, and facilitate early market discipline.

The Basel Committee has imposed an important additional condition on the risk weighting of sovereigns. For any risk weight below 100 per cent, the sovereign has to subscribe to the IMF 'Special Data Dissemination Standard' (see section II). The BCBS is also considering adding other relevant transparency codes and standards as part of the conditionality. This represents a highly welcome step to tie the risk weights to other parts of the financial architecture, so reinforcing incentives for borrowing countries to adopt best practice standards. It also makes sense in terms of reflecting risk, since ratings agencies and others will be unable to reach sound judgments in the absence of crucial information.

Similarly, risk weights for banks and securities houses are linked to adoption and implementation of the Basel and IOSCO sets of Core Principles. Again this represents a welcome reinforcement of incentives, and also reflects the view that inadequate supervision increases the risk of sudden failures.

A final relevant point on the proposed risk weights is that the BCBS has proposed abolishing the 50 per cent cap on the risk weighting of exposures to derivatives counterparties. At present, an exposure which would otherwise carry a 100 per cent weight incurs only a 50 per cent weight if it arises out of a derivatives contract. The rationale for this was questioned in the Brockmeijer report on Highly Leveraged Institutions (see below), since the LTCM episode had demonstrated that derivatives counterparties are not necessarily high quality. The policy also looked questionable in the light of the Asian experience, where, as the value of derivatives contracts grew with currency and interest rates movements, the ability of Asian counterparties to pay out on these contracts simultaneously declined.

(ii) Treatment of maturity

The current treatment of maturity in the capital framework has received criticism on two fronts: first, that there is no general recognition of the fact that risk is correlated with maturity, so that a 10 year loan to a corporate gets the same capital charge as a one year loan; and second, that the 20 per cent risk weight for all interbank lending of under one year may have encouraged excessive borrowing at short maturities by emerging market economy banks, making them vulnerable to rollover risk in the event of a change in investor sentiment (see Box 3 for a discussion of the evidence on the influence of the 20 per cent capital weight).

The issue of maturity will have to be addressed in the course of developing the internal gradings approach. In the standardised ratings-based approach, the differentiation between corporate borrowers remains fairly limited, with the result that superimposing a maturity structure risked

introducing anomalies (eg a short maturity low quality loan requiring less capital than a slightly longer maturity high quality loan). The BCBS has not therefore proposed introducing a generalised maturity dimension.

It has, however, set out possible changes to the maturity treatment of interbank risk weights, which would either abolish the maturity distinction entirely, or reduce the weighting differential. Under the latter approach, the basic risk weight of a bank would be determined by its rating, but claims of short maturity — for example less than six months — would allow the risk weight to move in a favourable direction into the next risk bucket. If adopted, this approach would not completely move away from a short term/long term distinction, but the differential between the weightings would be less sharp (for example short maturity exposures to a 50 per cent weighted bank would progress into the 20 per cent bucket, while such exposures to a 100 per cent weighted bank would progress into the 50 per cent bucket). This means also that a uniformly low-risk weight for short-term lending to banks, regardless of their quality, would no longer be available.

(iii) Supervisory review of capital adequacy

The revised minimum capital standard is intended to be one of three pillars to the new Accord. The second pillar — called the supervisory review of capital adequacy — seeks to ensure that regulators set capital requirements above this minimum in the light of the particular risk profiles of individual banks; and that they take early action in the event of a deterioration in capital adequacy. This is of course long-standing practice in the UK, but for some other regulators, even the legal ability to require capital above the minimum 8 per cent would be a significant innovation. This approach has implications for G10 banks with large-scale lending to volatile emerging markets, and more directly for EME banks themselves if their regulators adopt this part of the Basel framework.

(iv) Market discipline

Enhanced market discipline represents the third pillar of the proposed new Accord. The BCBS intends to facilitate this by introducing detailed guidance on disclosure of capital levels, risks, and capital adequacy. This would represent a continuation and development of the work the BCBS has already undertaken on promoting bank transparency. To the extent that banks involved in lending to relatively risky EMEs are forced by the market to hold higher capital, this will also affect the pricing of such loans.

Recent examples of financial problems — South East Asia, Russia and LTCM[28] — have demonstrated that risk management practices at creditor banks and securities houses were deficient in some respects. Collateral policies and covenants were sometimes relaxed or absent; collateral was not properly evaluated for correlation of risk with the underlying obligor; the weakness of legal systems in some emerging markets was not properly recognised, with consequences for the enforceability of claims; stress testing of exposures was limited; and the links between market risk and credit risk were greatly under-appreciated. An improved Basel capital standard can only partly compensate for such deficiencies: there needs to be an accompanying emphasis on improving risk management by banks and securities houses, and more in-depth assessment of individual institutions by regulators.

Highly leveraged institutions

In addition, the events of the past two years, and particularly the LTCM case, have prompted specific questions about the activities of HLIs and creditor policies towards them. The Basel Committee on Banking Supervision set up a group to examine supervisory implications of banks' business with HLIs. Its main findings are set out in Box 4[29]. The BCBS will consider how best to follow up the group's specific recommendations on capital treatment as part of the wider review of the Basel capital framework. A number of other groups — international and national, in both public and private sectors — have also been established to examine HLI issues.

Separately from the potential for HLI failures to have wider knock-on effects in financial markets, a number of emerging market countries are concerned about the role HLIs can play in taking speculative positions in their currencies and the potentially destabilising impact which this can have on their exchange rates. This has been one factor behind the work on transparency described below.

The recently established Financial Stability Forum has set-up a Working Group which will take stock of all the work being done on HLIs in different fora. It plans to identify issues that have not yet been adequately covered in existing work and propose suitable procedures for dealing with them. It will also establish what is being done to implement recommendations already made (e.g. by the Brockmeijer Group) and consider the need for further impetus to enhance implementation.

Transparency

A number of initiatives are underway in various international fora — including the IASC, the BCBS, IOSCO and the CGFS — exploring possible ways of improving disclosure by financial intermediaries. Recent papers

Box 4 The Brockmeijer Report on Highly–Leveraged Institutions

Following the near collapse of Long-Term Capital Management in autumn 1998, the Basel Committee on Banking Supervision established a working group, under the chairmanship of Jan Brockmeijer of the Dutch central bank, to examine the implications for supervisors of banks' business with Highly Leveraged Institutions (HLIs). It defined an HLI as a large financial institution which is subject to little or no direct regulatory oversight; is subject to limited disclosure requirements; and takes on significant leverage.

The report of the Group was issued in January 1999. It identified a number of concerns in relation to HLIs:

- The defining characteristics of HLIs mean that it can be difficult for counterparties to evaluate the full extent of risk in their own exposures to HLIs;

- Even when HLIs pursue arbitrage or market neutral strategies, the large size of positions and consequent reliance on market liquidity can create substantial risk for HLIs, and for the wider system;

- There were deficiencies in many banks' risk management practices with respect to some HLIs. Key shortcomings included:

  - due diligence and monitoring of exposures to HLIs after the initial credit-granting process was, in many cases, inadequate;

  - there was excessive reliance on collateral, and insufficient account taken of risks posed by illiquidity of collateral and difficulty of replacing positions under adverse market conditions;

  - collateral agreements negotiated between HLIs and their bank counterparties tended to be very favourable to HLIs (e.g. no initial margin; two-way margining), and were often determined by competitive market conditions and the overall size and reputation of an HLI rather than an objective assessment of risk;

  - LTCM, and other HLIs, secured highly favourable close-out provisions on their contracts (some were able to secure close-outs on declines in net asset value (NAV) of 40-50 per cent, compared to the ISDA-recommended 20 per cent);

  - Aside from the NAV thresholds, banks did not have flexible contractual provisions that could become tougher as the credit quality of the counterparty declined.

The report recommended to banking supervisors that:

- There should be a greater focus on the credit procedures which banks adopt in credit-granting, and credit-exposure monitoring, in relation to HLIs. To that end, the Basel Committee issued a 'Sound Practices' paper alongside the Brockmeijer report.

- The incentives created by regulatory capital standards in relation to banks' dealings with HLIs should be considered in the review of the Basle Accord. In particular, a capital charge higher than the standard 100 per cent might be applied to exposures not accompanied by adequate financial covenants, especially to limit leverage to a prudent level; capital charges might be introduced to cover unsecured exposures potentially resulting, under adverse market conditions, from repo transactions — which would encourage payment of initial margin; and consideration should be given to abolishing the concessionary 50 per cent risk weight for non-bank OTC derivative exposures.

- The transparency of major financial institutions, including but not limited to HLIs, should be increased. This is being considered by the BIS Committee on the Global Financial System.

- There would be a number of obstacles to direct regulation of HLIs. These include the difficulty of defining sufficiently precisely — for operational purposes — what is meant by an 'HLI', and the likelihood that regulation could be circumvented through HLIs moving to offshore jurisdictions.

include the BCBS's September 1998 paper on Enhancing Bank Transparency[31], which described broad principles for disclosure and the broad categories of information which it should cover; the BCBS's October 1998 consultative paper on sound practices for loan accounting and credit risk disclosure; and the joint publication by IOSCO and the BCBS in February 1999 of recommendations for public disclosure of trading and derivatives activity. Various of the IASC's International Accounting Standards also contain disclosure guidance relevant to financial institutions.

Given the number of bodies involved in this issue, a key challenge will be to ensure that recommendations are consistent. Joint efforts — such as that by the BCBS and IOSCO — are helpful in ensuring firms with similar activities are subject to similar requirements. The work of the CGFS on enhanced disclosure by individual institutions goes a step further, attempting to draw up a template for disclosure of market, credit, and liquidity risks applicable to a wide range of financial institutions. The CGFS has proposed a voluntary pilot study with market participants, since it recognises that the public disclosure of such information could involve a significant shift in the boundary between what is now deemed private and public information, enlarging the scope of the information publicly disclosed by financial market participants. The behavioural effects of this will need to be assessed carefully.

The CGFS has also established a Working Group on the Transparency of Aggregate Positions. The objective is to examine whether the collection and publication of further data of an aggregate kind would enable markets to work better — for example, by allowing market participants better to assess the size, and hence liquidity, of their positions in relation to the market as a whole. The group is considering the costs and potential benefits of collecting a range of data, including transactions data similar to the kind covered by the BIS triennial survey of foreign exchange and derivatives market activity and various possible improvements to the BIS international banking and securities statistics.

CRISIS CONTAINMENT

VII Overview

Two of the most striking features of the recent financial crises are contagion and the way in which some forms of financing can exacerbate a crisis. Crisis prevention measures of the type described above may not be enough to protect a country from a liquidity crisis, and thus potentially from a solvency crisis in its banking or corporate sectors. It is this feature of the international financial system that prompted a debate on whether rapid and effective liquidity support can be provided to countries hit by contagion. While arrangements closely analogous to a domestic central bank's lender of last resort capability are probably not feasible, the international community has explored whether a facility of some kind might be made available. Section VIII describes the IMF's new Contingent Credit Line, and Section IX outlines some of the current ideas on forms of private sector finance that may help to contain, rather than exacerbate, crises.

VIII IMF Contingent Credit Lines

After much debate, the IMF has recently decided to add Contingent Credit Lines (CCLs)[32] to the range of financial facilities which its members countries can utilise. Unlike other IMF facilities, which are made available to member countries at times of balance of payments financing need (in conjunction with an agreed policy programme aimed at returning the country to a sustainable external position), CCLs are intended to protect "innocent bystanders" by providing contingent support for a country whose economy is basically sound, but remains vulnerable to contagion.

In order to qualify for a CCL a country will need to satisfy four eligibility criteria:

i at the time a contingent credit line is put in place, it must be implementing policies which make it unlikely that it will need to use IMF resources, unless the country were to be affected by adverse developments in international capital markets;

ii its policies must have received a positive assessment from the IMF at the time of the last Article IV consultation, taking into account also the extent of the country's adherence to internationally accepted standards (see sections II to V above);

iii it must be "maintaining constructive relationships with its private creditors with a view to facilitating appropriate involvement of the private sector," and have made "satisfactory progress in limiting external vulnerability through the management of the level and structure of its external debt and international reserves";

iv it must submit a satisfactory economic and financial programme, including a quantified framework, which it stands ready to adjust as needed.

Under (iii) a country will be required to demonstrate that either it has in place, or "demonstrate that it is making credible efforts towards putting in place", appropriate

arrangements to involve the private sector. The following are given as examples of the type of arrangements the Fund will be looking for:

- contingent private credit lines, or similar arrangements;
- options on debt instruments that would permit the debtor to extend their maturity;
- terms and conditions in recent and forthcoming bond contracts that include provision for the adjustment of terms by qualified majorities, collective representation provisions, and sharing clauses;
- other debt instruments designed to provide efficient and appropriate insurance against shocks;
- a framework for debtor/creditor discussions;
- effective debt management procedures;
- strong domestic bankruptcy regimes.

While it is encouraging that the IMF will take account of the relationship a country has with the private sector in deciding whether to grant a CCL, some argued for stronger conditionality — for example, agreement on a CCL might have required parallel contingent lines from private sector creditors, and a commitment that the IMF and private lines would be drawn down on a broadly *pari passu* basis.

In assessing the country's external vulnerability and the management of its external debt profile — the second part of the third eligibility criterion — the Fund intends to conduct a number of "sustainability checks". These will include:

- the sustainability of the real exchange rate;
- the level, currency denomination and maturity profile of public debt, taking account of derivatives and creditors' put options;
- the level and composition of external debt, taking account of derivatives and creditors' put options;
- the level of gross and net international reserves;
- the amount of short-term external debt unmatched by private contingent credit lines or reserves;
- the net foreign asset position of commercial banks;
- the evolution of domestic credit in relation to GDP.

To assist the Board's assessment of a country's external vulnerability the staff and the authorities of the country will be expected to provide "quantified stress simulations", which will take into account both potential outflows and secured inflows in the event of a crisis.

Once a country has been granted a CCL it may, at any time, request access to CCL resources (normally in the range of 300 to 500 per cent of the country's IMF quota[33]). This would trigger a "special activation" review by the IMF Board. The Board would allow the CCL to be drawn provided it was satisfied that: (i) the country was experiencing exceptional balance of payments difficulties resulting from a sudden and disruptive loss of market confidence; (ii) these difficulties were judged to be largely beyond the country's control and to be primarily from adverse developments in international capital markets consequent upon developments in one or several countries; (iii) up to the time of crisis, the member had successfully implemented the economic programme it had presented to the Board as a basis for its access to CCL resources; and (iv) the country was committed to adjusting policies to deal with any real impact that might follow from the contagion.

It is too early to assess how much use will be made of CCLs. On the one hand, seeking a CCL may come to be regarded as a sign that the country thinks itself particularly vulnerable to shocks, in which case countries may be unwilling to apply for a CCL. On the other hand, investors may view a country gaining a CCL from the IMF in a positive light, on the grounds that it implies that the Fund thinks the economy is basically sound, albeit potentially vulnerable to contagion effects.

IX Innovative private sector instruments

A number of ideas are circulating on forms of private sector finance which may reduce the severity of a crisis once it strikes. To the extent that they succeeded in doing so, they could also make a contribution to the prevention of crises, partly by affecting behaviour in normal trading conditions. If a country were to contemplate any such course, it would need to analyse the pros and cons carefully with its financial advisers in the light of its particular current and prospective circumstances.

Private sector contingent lines of credit

Contingent financial arrangements are a form of private, market-based insurance: the prospective borrower pays an insurance premium to compensate the writers of the option

(the creditors) for the risk they take on. Argentina, Indonesia and Mexico have in the past arranged contingent lines of credit with private banks that can be drawn upon in the event of difficulties. These arrangements, which have taken different forms, all involve the payment of a regular commitment fee in exchange for opening and maintaining a credit line, with an "evergreen" clause to provide for renewal of the arrangement to be attractive. The commitment fee is likely to cost less than the margin between borrowing medium-term funds in the international capital markets and holding them as liquid foreign currency assets. (Information on the details of these facilities and the use that has been made of them can be found in the IMF paper of April 1998 "Involving the Private Sector in Forestalling and Resolving Financial Crises"[34].)

Questions have been raised about the extent to which the activation of such lines would provide genuine additional balance of payments financing. It is possible that the banks involved may simply offset the increase in exposure associated with the line by reducing exposures elsewhere, so as to leave their overall exposure to the country, or a group of countries, unchanged. Given the limited use that has so far been made of these lines, it is difficult to judge the extent to which such activity might vitiate the purpose of contingent lines of credit.

Call options in inter-bank lines

The essence of this proposal is to include options in inter-bank credit lines that would provide a contractual basis for an extension of maturity at the option of the borrower. A variant of the proposal is to make the exercise of the option conditional upon the prior declaration of a state of "disorderly markets" by the national central bank located in the jurisdiction governing the terms of the instrument, or by the IMF. It is, however, possible that the announcement of discussions between a country and the IMF could raise concerns about the triggering of the option, and so lead to a loss of maturing short-term lines in advance of a call, exacerbating, rather than alleviating, the country's liquidity difficulties. Some proponents of these types of arrangements (e.g. Buiter and Sibert[35]) argue that these potential drawbacks can be avoided by requiring such options to be embedded in all foreign currency debt contracts. However, that may not be realistic.

Structured notes

These are instruments that provide insurance by having a debt-service burden that is higher in good times than bad. By lowering debt service payments when a country's capital account was under pressure, this might relieve some of the strain on the country's external position and therefore help it through a crisis period. Structured notes have normally taken the form of customised instruments with a bullet redemption and with either the redemption value or the coupon linked to movements in one or more economic variables: typically a currency, an interest rate, an asset or commodity price, or a combination thereof. The variable, or variables, to which the payments are linked need to be outside the control or direct influence of the authorities of the country issuing the note, for obvious moral hazard reasons. To make the insurance operational, the economic developments to which the notes were linked would need to be capable of being defined objectively and independently measurable.

Such instruments have so far been relatively unusual in emerging market economies. A potentially attractive feature is that, by the nature of the contract, they embody an automatic degree of burden-sharing between the creditor and the debtor in the event of adverse shocks. Burden-sharing could be better achieved ex ante, through the design of appropriate financial contracts, than ex post through costly and time-consuming argument and litigation. The insurance feature of structured notes means they are likely to be more expensive to service than plain-vanilla debt. A key question, therefore, in considering any wider use of these notes would be whether borrowing countries were prepared to pay the extra up-front borrowing cost (effectively an insurance premium). A country and its advisers would also need to ensure that their debt burden would decrease, and not increase, in the face of adverse shocks.

Official enhancements of new debt

The proponents of providing full or partial official guarantees of new emerging market debt issues argue that such guarantees would "leverage" official financial resources, supporting a larger amount of financing, while lowering the cost of private financing for emerging market borrowers. Such guarantees might help to introduce a country to international capital markets or to restore a country's access after a severe crisis.

A key question in assessing the pros and cons of such guarantees is whether they would be likely to provide genuine benefits to the borrowing country, either in the form of the private sector being prepared to accept additional unguaranteed exposure, or through a lengthening of maturities. Since it is now common for markets to strip instruments into different risk classes, the guaranteed portion of a bond could in principle be stripped from the unguaranteed portion, with the resulting

Box 5 Could the Official Sector Usefully Write Put Options on Sovereign Debt?

Several financial engineering ideas have recently been suggested for helping forestall and/or resolve financial crises. One of the more innovative is that the official community could write put options on the sovereign debt of a country.[1] The economics underlying the scheme is as follows.

The strike price of the option would be set by the official sector at a level which was well below the debt's face and market values. So the option could be exercised by the holder of the debt only in the event of a severe capital outflow from a country, which pushed debt prices sharply lower. If the price were pushed down to the exercise price and the option exercised, the official sector would agree to buy back the debt at that price. In this way, it is argued, the price of the debt would be underpinned by the official sector and the capital outflow effectively staunched. More optimistically, by underpinning the price in this way, the embedded option might even help reverse the capital outflow ahead of the exercise price being reached. In that event, financial crisis — capital outflow and falling asset prices — would effectively be forestalled.

Behaviourally, the official sector issuing put options in this way is similar to offering partial loan guarantees. In both cases, the debt of a country is partially underwritten. The higher the chosen exercise price — or the lower the price charged by the official sector for writing the option — the greater the extent of the guarantee. Back in October 1987, the Bank of England operated a similar scheme, underwriting the price of BP shares whose when-issued price had fallen well below their pre-announced price following the stock market crash.

The embedded option proposal has a number of advantages and disadvantages.

Potential advantages

a Embedded options in sovereign debt could provide an ex-ante floor to debt prices. This could help reduce the chances of capital outflows and of asset prices undershooting their long-run values. "Runs" on a country's assets might therefore be less likely to arise in the first place.

b The guarantee offered by the option could only be partial: the exercise price of the option would lie below (potentially, considerably below) the current market price. This might help to reduce the potential moral hazard problems associated with official sector intervention.

c The option would be called only if the price fell to its exercise price. But if the guarantee were credible and successful, the price should never fall that far, in which case official sector money would rarely need to be disbursed.

Potential Disadvantages

a Any guarantee issued by the official sector raises difficult conditionality questions. For example, what would be the response of the official sector if a country whose debt was underwritten were to pursue policies which were seriously off-track?

b A related question is whether an option written on a sovereign debt instrument could plausibly be withdrawn by the official sector. If it could not, then this could expose the official sector to potentially substantial downside risks. If the option could be withdrawn, the act of withdrawal could itself help trigger liquidity problems.

These are issues that would need to be weighed carefully in determining the usefulness of debt options proposals for resolving sovereign liquidity crises.

Note

1 This idea has been proposed by Bluford Putnam, President of the CDC Investment Management Corporation in New York.

payment streams being traded separately. If that were to happen, it is not obvious why creditors would be willing to increase their overall exposure to sovereign risk in the framework of a partial guarantee.

Considerations such as these, and the need to weigh the merits of guarantees against those of direct lending, have prompted the multilateral development banks[36] to proceed cautiously in using their powers to guarantee debts. The World Bank has recently conducted a review of its experience in issuing partial risk guarantees in respect of projects and decided to extend undertake a $2bn pilot

program of partial credit guarantees for policy based loans. Hence, for the foreseeable future, the contribution official IFI guarantees are likely to make in helping countries cope with crises is going to be small.

However, Japan has made a more significant commitment to guarantee debt issues of a number of the Asian countries which have been affected by the crisis (Indonesia, Korea, Malaysia, the Philippines, Thailand and Vietnam).

Put options

At times during the recent market turbulence, the liquidity of emerging market debt instruments declined sharply, and creditors were unable to unwind their positions through secondary market trading, except at large discounts. Lack of liquidity during periods of stress may lead to higher borrowing costs on new issues. One idea that has been advanced to address this problem, summarised in more detail in Box 5, is to attach put options, underwritten by international financial institutions. During periods of sharp declines in price, a so-called "liquidity put" would allow the holder to offer the bond back to the issuer at a price below, but close to, the average price over some defined preceding period. The effect should be to cap the extent to which prices can decline in a short period, thus providing a basic level of liquidity to the market. The international financial institutions have not yet shown any inclination to become involved in this type of business.

CRISIS RESOLUTION

X Overview

While the hope must be that significant progress will be made, over time, on the large crisis prevention and containment agenda set out in the first two parts of this article, it would be unrealistic to assume a crisis free world. There is therefore a continuing need to consider what, if anything, can be done to minimise the impact of crises when they occur and to ensure their speedy and effective resolution. Crisis prevention and resolution are of course not independent. This is clearly recognised by the Institute of International Finance, which advocates the establishment of an ongoing dialogue between a sovereign borrower and its major creditors in which the frequency and intensity of contact would be stepped up as a country's economic and financial prospects deteriorated. The proposals advanced by the IIF in the January 1999 report of its "Working Group on Financial Crises in Emerging Markets" are outlined in Box 6[37].

The way in which crises are resolved — and in particular expectations about the way in which they will be resolved — can affect incentives, and so can contribute, helpfully or unhelpfully, to crisis prevention. If official finance, as provided by the IMF and the US government to Mexico in 1995, replaces fleeing private capital it is effectively bailing out investors and, by shielding them from losses, risks encouraging further imprudent lending and thus setting the stage for future crises. The aftermath of Mexico also sent a signal that investors were less likely to sustain losses by investing in short term instruments. This lesson was re-enforced by the Korean package in late 1997 where large-scale outflows of short-term inter-bank debt were, at least initially, fully refinanced by the IMF, the World Bank and the Asian Development Bank[38]. By way of contrast, the Russian crisis of August 1998 provided a stark illustration of what can happen when a public sector bail-out is widely expected, but in the event not forthcoming.

Neither bail-out on the one hand, nor non-intervention on the other, seems satisfactory. Avoiding both routine large scale bail-outs and highly disruptive defaults requires a more orderly way of restructuring problem debts. While it is vitally important for the functioning of market economies that it should be difficult and costly for borrowers to walk away from their debts, at present the difficulties involved in restructuring debts are much greater in international markets than domestically. This has led a number of academics[39] to call for the establishment of an international bankruptcy court to create an analogue to domestic bankruptcy procedures. However, this proposal raises a host of complex practical issues (as pointed out, inter alia, by Barry Eichengreen[40]): not least, how a satisfactory legal basis could be established, how the different insolvency provisions in different countries could be reconciled, and how such a court could enforce its judgments. Even if the international community were to wish to establish such a regime, it would take many years to implement.

The policy debate has therefore concentrated on other possible ways of making international sovereign work-out arrangements somewhat more analogous to domestic procedures. Section XI summarises the arguments concerning concerted rollovers of inter-bank exposures. The contribution that collective action clauses in bond contracts could potentially make to the orderly inclusion of sovereign bonds in restructuring a country's sovereign debt is discussed in section XII (and the technical details are explained in the separate article by Andrew Yianni of Clifford Chance in this issue of the FSR). And section XIII considers the case for and against internationally sanctioned standstills, and whether there are any circumstances in which outward exchange controls might in principle assist in crisis resolution. In each of these cases, the public policy measures are effectively serving two functions. First, they facilitate

Box 6 IIF Proposals for Public-Private Co-operation

The IIF advocates establishing an ongoing dialogue between sovereign borrowers and their major creditors. In the January 1999 Report of its "Working Group on Financial Crises in Emerging Markets", the IIF suggests that there are four stages or sets of circumstances faced by countries that experience financial crises — normal conditions; incipient crisis; crisis resolution or workout; and transition to market re-entry — and that a different type of dialogue is appropriate for each of these phases.

Phase One: Normal Market Access

The IIF suggests that the most appropriate model for contact would be something akin to the quarterly briefings initiated in 1996 by Mexico at the level of senior Finance Ministry and Central Bank officials, with the most important features being regularity and honesty. The IIF stresses that these meeting should not be seen as a marketing exercise, but rather as "opportunities to shape market sentiment by building trust and familiarity, thereby avoiding sharp breaks in market access".

Phase Two: Incipient Crisis

The IIF recommends that countries initiate intensive consultations with key creditors when there is evidence that market confidence is declining. The purpose of such consultations would be to discuss policy actions and likely market responses, to assist private sector creditors to make a frank assessment of their position, and to give the private sector the chance to suggest the type of policy measures it would like to see the country implement.

Phase Three: Crisis Resolution

The IIF proposes that the group of key market participants assembled before the crisis should be broadened at an early stage after crisis occurs. This should help with speedy debt restructuring and the design of a programme that would facilitate the country's return to normal market access and debt restructuring if neccesary. The most appropriate forum for restructuring sovereign obligations to banks would be the London club.

Phase Four: Capital Market Re-entry

In the final phase, transition to capital market re-entry, the cycle has come full circle and the country should aim to achieve the relations described in Phase One. The IIF suggests that reports on the economy from an independent body, describing improvements that had taken place could help mark the beginning of this process.

Systemic issues

In addition to establishing regular communication between individual sovereign borrowers and their creditors, the IIF has also called for an ongoing dialogue between the private and public sectors on issues of systemic interest to the global financial system to be established. They suggest that such discussion would help to ensure that proposals for strengthening the architecture of the international financial system on which there is a consensus, are implemented promptly and effectively. In areas where private and public sector proposals diverge, these discussions could facilitate a convergence of views on pragmatic steps that can be taken by the various parties concerned.

"bailing in" — sharing of any burden by creditors. They also, however, facilitate "binding in" — preventing individual creditors going their own way. The latter function is important as it is in both creditors' and debtors' best interest to guard against grab-races for assets.

A feature of many of the crises of the past few years has been that it is not just a country's external debt position that comes under stress, but also the liquidity and solvency of its banking system and corporate sector. Section XIV considers some of the lessons that have been learned about banking sector restructuring, and section XV briefly discusses the importance of countries having effective debtor-creditor and insolvency regimes.

XI Concerted rollovers of short-term inter-bank lines

Short-term inter-bank lines have been an Achilles heel in a number of recent financial crises. This is because of their short-term nature on the one hand and the reluctance of the authorities to allow banks to default for fear of triggering a systemic banking collapse on the other. (Incentives for reducing dependence on these flows have already been discussed in the prevention section of this article.) In the case of Korea, against the background of a haemorrhaging of official reserves and the prospect of an imminent default, the major banks in the main financial centres, following consultation with the financial authorities, decided to maintain their levels of exposure and to participate in a restructuring. The success of the Korean

operation — Korea returned to the capital markets just four months after the intervention by the monetary authorities and regained its investment grade rating a year later — has led a number of commentators to suggest that this is the way all crises should be resolved. (Concerted roll-overs were also a common feature during the 1980s debt crisis.)

However, there were at least two features of the Korean case which suggest it may not always be straightforward to replicate this course of action. First, Korea's restrictive exchange control regime forced a high proportion of imported foreign savings to be channelled through domestic banks. This facilitated co-ordination of creditors during the crisis and provided an assurance that once the outflows from the banking system had been stopped, the capital account would stabilise. Secondly, the comparatively low level of Korea's outstanding sovereign external debt meant that it was possible for the government, in the context of the restructuring operation, to guarantee the external debt of the banks without this placing an excessive burden on the government's own debt position (although it creates the need for a regime change in due course to escape the moral hazard consequences of such action).

To the extent that creditor banks operate country exposure limits, forcing them to maintain their exposure to financial institutions is liable to transfer at least part of the pressure to the corporate sector. Similarly, if banks have regional exposure limits, asking them to maintain exposures to one particular country could result in lines to other countries being reduced, with the result that the financial pressures are "exported" to those other countries. In addition, if used as a standard technique to "bail-in" private creditors in the context of IMF programmes, there would be a serious risk of news that a country had initiated policy discussions with the IMF triggering a "rush for the exits" as creditor banks attempted to unwind their exposures before getting caught up in a concerted rollover. Thus, the potential systemic consequences of resorting to concerted rollovers and restructuring operations suggest that their use should be limited in the future to cases where default otherwise seems unavoidable.

XII Incorporating collective action clauses in sovereign international bond issues

The increase in the amount of emerging market bond financing in the 1990s[41] has highlighted the question of how private sector holders of bonds can be involved effectively in the resolution of sovereign liquidity crises[42]. When such crises arise, there is a good case in principle for bonds being restructured on comparable terms with other instruments where they represent a material part of a country's obligations, unless they explicitly carry preferential terms. At present, agreeing rescheduling terms on a voluntary basis is likely to be difficult with bonds issued under US law, because they do not include contractual provisions for qualified majorities to modify the terms of the bond or to impose such modifications on minority bond holders.

It was these considerations which, back in 1996, led the G10 to recommend — in a Report produced in the wake of the Mexican crisis (The Resolution of Sovereign Liquidity Crises[43]) — that the resolution of sovereign liquidity crises would be facilitated if international bonds were to include clauses providing for collective representation and majority voting provisions in respect of modifying the terms of a bond, and sharing clauses to deter individual creditors from instigating legal proceedings. The G10 Report noted that many international bonds issued under UK law already contained a number of these features. The findings of the 1996 report were revisited, and endorsed last year by the G22[44] and by the Finance Ministers and Governors of the G7 countries in their Declaration of October 1998.

However, little progress has been made in the intervening years towards wider adoption of such clauses. The recent refocusing on this issue has led to renewed calls for the G10 countries to take the lead by including the relevant clauses in their own bond issues[45]. Any demonstration effect could be complemented by efforts to build a consensus in support of these changes among key financial institutions and legal firms involved in issuing and underwriting sovereign bonds. A more radical approach, advocated by some, would be for the authorities in the markets where international bonds are primarily issued to introduce regulations requiring new sovereign issues to meet specified minimum conditions, including the collective action contractual provisions.

While, over time, the inclusion of collective action clauses in new international bond issues could make a contribution to facilitating orderly work-outs, the initial impact would be limited as the current outstanding stock of bonds would be unaffected. If the inclusion of such clauses is seen by investors as increasing the likelihood of bonds being restructured in the event of future crises, their introduction could cause a rise in spreads and limit market access for less creditworthy borrowers. On the other hand, the fact that there would be a clearer framework to facilitate orderly workouts when a crisis broke could have a beneficial impact on pricing.

XIII Some pros and cons of internationally sanctioned standstills and the use of outward capital controls

In the event of a very severe crisis, a country may effectively be forced to consider declaring a moratorium on servicing its external debt, to give it a breathing space in which both to agree an adjustment programme with the IMF and to hold discussions on voluntary restructuring with its major creditors[46]. This can deliver mutual benefits to both creditors and debtors by forestalling grab-races for assets; it can help ensure a "co-operative" rather than "non co-operative" solution to the debt work-out process. Unilateral debt moratoria are more likely to damage a country's standing in capital and banking markets than if undertaken with the support of the international community.

Although the IMF currently lacks the necessary legal powers to enforce a standstill (which would require an amendment of the Fund's Articles, and legislation in many countries), it would in principle be open to the IMF to indicate whether or not it approved of the action a country had taken. In practice, most countries would see it as in their interests to have consulted closely with the IMF before contemplating such a major step. If approved standstills were possible as a last resort measure taken in the face of a severe crisis for which no other solutions were viable in the short run, the "rules of the game" would be clearer. In particular, it would be clear when a country had defaulted without international support.

There would, however, be potential downsides. If internationally sanctioned standstills were to become a part of the "toolkit" for handling external payments problems, there could — as with concerted rollovers — be a sharper and earlier "rush for the exits" whenever a country's position seemed to be deteriorating. This could bring on the crisis the country was trying to avert, and so bring forward the time when the imposition of outward capital and exchange controls may become unavoidable. More generally, some uncertainty would remain as it would be impossible to specify fully the conditions under which the IMF would approve a standstill. That would depend, among other things, on the nature of the shock affecting a country, its underlying macroeconomic position, and the potential for spillovers to other countries. This may also call for some flexibility — in effect some discretion — in choosing when and where to approve a payments standstill.

If the international community were to conclude that sanctioned standstills should be made possible, a country benefitting from such international support would obviously need to be in active and constructive negotiations with the Fund over a programme aimed at strengthening its economic policies; and it would need to negotiate constructively with its major creditors on a voluntary rescheduling in the breathing space provided by the sanctioned standstill. In those circumstances, the Fund might be able to signal its approval of the country's actions by being prepared to disburse funds, under the newly worked out adjustment program, while the standstill was still in place and negotiations between the country and its creditors had not yet reached their conclusion. This is often referred to as the IMF lending into arrears[47].

Unless, or until, robust legal arrangements are in place to enforce an IMF-sanctioned standstill[48], the debt renegotiation process will be exposed to the risk that some creditors could resort to the courts. However, if a debtor is seen to be negotiating in good faith, and to be co-operating closely and willingly with the IMF, it seems likely that a majority of creditors will take the view that their interests will be served by negotiating a restructuring of their outstanding claims rather than by precipitating a disorderly scramble for assets.

XIV Bank restructuring

Effective crisis resolution will often call for more than debt rescheduling and revised macroeconomic policies. IMF programmes have increasingly included financial sector, particularly banking sector, restructuring. In a situation of severe financial sector crisis, it is unlikely that entirely private sector approaches to bank restructuring will be viable. Officially-sponsored bank resolution schemes are currently operating in a number of countries around the world, including Japan, Thailand, Korea, Indonesia, and Mexico. Such schemes were also a feature in the resolution of a number of past financial sector problems, including the US savings and loans crisis and in Finland, Sweden, Spain, and Chile.

The objectives of such schemes are similar from country to country: the authorities generally aim to restore confidence in the banking system as quickly as possible, while minimising the cost and 'moral hazard' consequences of public support. The precise shape of any official restructuring plan has to depend, however, on the depth of the banking crisis and its causes, the existing structure of the banking sector in the country concerned, the relevant insolvency laws, and the form of any existing public 'safety net'. In other words, it is not possible to identify a single type of scheme that works best in all situations. There is, though, evidence of countries learning from experience — both their own and others' — and from this it is becoming possible to identify a few general 'good practice' principles.

(The G22 report on strengthening financial systems[49] and the IMF publication '*Systemic bank restructuring and macroeconomic policy*'[50] also propose principles of good practice.)

First, authorities need to identify as quickly, accurately, and transparently as possible the likely overall cost of the scheme. Underestimating this at the outset is likely to lead to delays in tackling restructuring in the most effective way, because, for example, it results in a repeated need for parliamentary approval of budget increases, or because it leads to an inappropriate design of the restructuring in the first place. A lack of resources to tackle the restructuring is in turn likely to lead to 'forbearance' towards insolvent institutions, with the consequences described in the next paragraph. Underestimation of the costs may also, crucially, undermine the credibility of the plan and fail to achieve the objective of restoring market confidence.

Second, the authorities need to identify non-viable institutions and bring them into the restructuring scheme as quickly as possible. Experience suggests that allowing non-viable institutions to continue operating on the same basis as solvent institutions is likely to increase the eventual costs of the resolution — such entities may be 'gambling for resurrection', or in some cases be looted by their owners. It may also dent, or even undermine, the business of otherwise viable banks, increasing the scale of the problem.

Third, the moral hazard effects of official intervention need to be minimised as far as possible. Some banks should be allowed to fail where this will not affect confidence in the rest of the system; problems which are of a troubled bank's own making should result in removal of high-level management and other responsible employees; shareholders and owners should not benefit from public funds, should be obliged to settle connected lending obligations, and should be required as far as possible to put in additional money; and there should be active pursuit over time of the recovery of public money through asset realisations and legal actions. This should reduce the chances of public recapitalisation affecting bank and depositor behaviour in an undesirable way, and should also help to gain public support for the scheme. To the extent that moral hazard is unavoidably created in addressing a crisis, there may need to be a regime change later on to address the consequent risks of further crises.

Fourth, any legal obstacles in the way of undertaking the restructuring or achieving it at least cost need to be removed. Such obstacles will again lead to delays in tackling restructuring, with adverse consequences as described. Any legal obstacles to private sector recapitalisation also need to be reviewed; for instance, in a number of recent cases, barriers to foreign ownership of banks have been relaxed or lifted. That not only reduces the call on the public purse, but also enables the introduction of outside expertise into the system.

Fifth, identifying a lead agency with responsibility for overseeing the restructuring is likely to improve the management of the plan. In many cases the authorities have chosen to create a separate agency to take bad assets off bank balance sheets and manage them, or have given this function to a separate division of an existing agency. In countries where expert management resources may be scarce, this can help to focus the asset recovery efforts in one place and allow the banks to concentrate on longer-term business. In addition, a single body can co-ordinate the auctioning of assets with a view to avoiding a sudden swamping of the market. Moreover, having a single body report on progress in asset recoveries can improve transparency and monitoring. In some circumstances, however, it may be judged that the banks themselves have the best knowledge of the assets and likely successful recovery strategies.

Sixth, careful thought needs to be given to any anti-competitive effects of the restructuring. Some types of solution may be less harmful to viable institutions than others. Depending on the circumstances, mergers with existing healthy institutions with appropriate (and limited) government support may have some advantages relative to recapitalising the weak institutions and allowing them to continue as competitors to unsupported banks. Any financial inducements need to be strictly limited. And support should be structured to offer repayment or dividend possibilities to the relevant public agency should the condition of the institution improve sufficiently.

Finally, the bank recapitalisation and restructuring measures need to be accompanied by steps to tackle the deficiencies and problems that led to the crisis. Such measures may include improvements in banking supervisory rules, staffing and enforcement, improvements in loan valuation and accounting practices, improvements to market discipline (e.g. by limiting deposit guarantees or improving disclosures), and removal of possible official impediments to balance sheet viability or sound risk management (e.g. interest rate ceilings or directed lending policies). Such actions will be essential in containing the crisis and preventing the emergence of a second round of problems, and again should also help gain public support

Box 7 G22 Key Principles and Features of Effective Insolvency Regimes[1]

There are certain key principles and features that can be identified as important to an effective insolvency regime for commercial firms[2]. Such regimes should:

Maximise the Value of Assets. Insolvency law should provide for an alternative to liquidation in the form of a possibility of reorganising the debtor firm in cases where creditors would not involuntarily receive less than in a liquidation and the value of a firm to creditors and society is maximised by maintaining the debtor in operation. The maximum value for creditors can often be obtained through reorganisation rather than through liquidation. Court supervision of a reorganisation should be streamlined to foster efficiency since business rescues often require quick action.

New financing is critical to the ability of the debtor to reorganise and to the maximisation of the value of assets, whether in a reorganisation or in a liquidation. Protections, including in the form of priority in eventual liquidation distributions, should be provided to creditors that extend financing after a proceeding has commenced so that they will be encouraged to do business with the debtor. When insolvency does not result in payment in full of creditors' claims, consideration should be given in the context of reorganisation to providing a "fresh start" to honest debtors by discharging certain unpaid debts.

Strike a Careful Balance Between Liquidation and Reorganisation. An insolvency regime should carefully balance the advantages of near-term debt collection through liquidation and of maintaining the debtor as a going concern through reorganisation. A regime should seek to avoid disruption through liquidations (often the preference of secured creditors) and should seek to maximise going-concern value (often the preference of unsecured creditors). Increasing creditor bargaining power may lead to premature liquidations. On the other hand, increasing debtor bargaining power may incur costs and delays, and may affect the cost and availability of credit to the economy. Liquidation and reorganisation scenarios alike must contain appropriate incentives for company management.

Provide for Equitable Treatment of Similarly-Situated Creditors, including Similarly-Situated Foreign and Domestic Creditors. Similarly-situated creditors should be treated equitably. The ability to recapture certain transfers of assets, such as transfers that (i) prefer creditors; (ii) remove assets from the reach of creditors for the benefit of strangers to the proceeding; and (iii) are to related parties at less than full value, also generally helps promote equitable treatment among creditors and creditor confidence.

Provide for Timely, Efficient and Impartial Resolution of Insolvencies. Insolvencies should be resolved quickly and the operations of the business of the debtor should not be unduly disrupted while the process is underway. Within the context of insolvency, numerous disputes can arise that will require prompt resolution. Deadlines should be established in the law for resolution of specific matters and for the insolvency proceedings as a whole. Consideration should be given to expedited procedures (including "pre-packaged" plans), to the establishment of specialised courts or administrative tribunals, and to allocation of considerable responsibility to the entity administering the debtor's assets to handle insolvency cases efficiently.

Prevent Premature Dismemberment of the Debtor's Assets by Creditors. An insolvency procedure should be orderly and prevent premature dismemberment of the debtor's assets by individual creditors seeking quick judgments against the debtor. Collection of individual debts often reduces the total value of the pool of assets available to settle all claims against an insolvent borrower and precludes reorganisations. A stay of creditor action provides a "breathing space" for debtors and trustees to examine the debtor's operations without defending against creditor action and assurance to creditors that similarly-situated creditors will receive similar treatment without having to rush to obtain judgements. A critical issue is whether secured creditors are subject to a stay; if not, they may be able to undermine the proceedings by selling assets they hold as collateral that are vital to the debtor's business. Some mechanism should be put in place that will assure secured creditors that their rights will not be impaired by a stay.

Provide for a Procedure that is Transparent and Contains Incentives for Gathering and Dispensing Information. Transparency and incentives for gathering and dispensing information enable courts, the trustee and creditors to assess reorganisation and liquidation options.

Recognise Existing Creditor Rights/Respect Priority of Claims with a Predictable and Pre-Established Process. Outside insolvency, creditors may not all have equal rights; for example, secured creditors may have rights to collateral that are not shared by unsecured creditors. Recognition and enforcement of these differing rights within the context of the insolvency regime create certainty in the market, thereby facilitating the extension of credit. As a general rule, the hierarchy of claims established outside insolvency, or rule of absolute priority, should be maintained in insolvency. Where an insolvency regime disregards the terms of pre-existing contracts, perverse incentives can be established going forward. Senior claims should therefore be paid in full before more junior claims (including equity). Clear rules for ranking the priority of both existing and post-petition creditor claims are important in order to provide clarity to lenders who may be deterred if there is uncertainty as to where they stand in the event of insolvency proceedings.

One of the principal goals of an insolvency regime is to maximise, to the extent possible, the payment of creditors' legitimate claims and the recognition of creditors' rights. An insolvency regime should provide for effective creditor participation through the provision of effective notice of key matters to creditors and for creditors to have a voice in decisions (this is often done by a creditors' committee).

Establish a Framework for Cross-Border Insolvency. In order to coordinate among jurisdictions, an insolvency regime should provide for fair rules on cross-border insolvencies with recognition of foreign proceedings such as that provided for in the UNCITRAL Model Law on Cross-Border Insolvency.

Notes

1 This box is taken from the G-22 Working Group report on Managing International Financial Crisis, which is available on the IMF Website (www.imf.org)

2 The key principles and features of insolvency regimes set forth herein are intended to apply only to the insolvency of commercial firms and not to financial firms. However, an effective insolvency regime is a necessary tool for dealing with failing financial firms. Some of the key principles and features of effective insolvency regimes for non-financial firms, such as equitable treatment of similarly-situated creditors, are clearly appropriate for financial firm insolvencies as well.

for the restructuring. Work on these fronts was described in Section III above.

XV Corporate restructuring

Resolution of many of the recent crises has required reconstruction in the non-financial corporate sector as well as in the banking sector. This has highlighted the need for effective debtor-creditor and insolvency regimes. Insolvency regimes are an important underpinning for market activity. The aftermath of the financial crisis in East Asia has shown how conflicting incentives can prevent stakeholders from achieving voluntary agreements to rehabilitate firms, resulting in lengthy delays which risk a deterioration in the value of existing assets. Individual creditors may attempt to seize the borrower's assets for themselves, leading to a further erosion in the value of those assets. An effective insolvency law can reduce these co-ordination problems by providing a binding, collective procedure to preserve and maximise the value of a firm's assets, whether it is to be rehabilitated as a going concern or, ultimately, to be liquidated. Moreover, clarity as to the rights and risks attached to equity and debt exposures, both pre and post-insolvency, is a pre-requisite for an effective secondary market, and provides a backdrop against which out-of-court workouts and restructurings can be negotiated. In a well-functioning market economy such workouts can be much more important in practice than resolution through the bankruptcy courts[51].

Insolvency systems and related creditor rights vary considerably across countries, making it unlikely that a single set of standards will prove universally acceptable. Apart from differing historical traditions, countries are also likely to differ in the relative importance they place on the liquidation and rehabilitation options. Furthermore, to be effective in practice insolvency systems need experienced insolvency practitioners, liquidators, administrators, and courts. The varying degrees of institutional capacity in developing countries will thus also continue to produce significant divergence in insolvency and company restructuring practices.

There is, nevertheless, a growing consensus on the broad underlying principles of effective insolvency and debtor-creditor systems (see Box 7 for the set of key principles and features of insolvency regimes included in the October 1998 Report of the G-22 Working Group on International Financial Crises[52]). The October 1998 *Declaration of G7 Finance Ministers and Central Bank Governors*[53] called upon "the World Bank in co-operation with the IMF and other multilateral development banks to work with their members to put in place effective insolvency

and debtor-creditor regimes." The World Bank, the International Association of Insolvency Practitioners (INSOL), and the International Bar Association are working to identify the objectives of sound insolvency systems, the policy choices involved in systems design, and the necessary institutional infrastructure.

XVI Concluding remarks

The crises of the past few years revealed quite serious weaknesses in what has come to be called the "international financial architecture". Many of them concern weak risk management practices in creditor banks and investors, or debtor governments, banks and firms. To that extent, the remedies lie with the lenders and borrowers concerned. But that is not enough, as what is prudent at the level of an individual lender or borrower depends on the behaviour of others. The international community has a clear interest, both because of the threat of contagion and on account of the cost of providing financial assistance to avert or stem crises which threaten systemic consequences. It can contribute by developing codes and standards, by providing incentives for their implementation, and by taking steps to encourage better risk management practices by both debtors and creditors.

While nothing as dramatic as negotiating a New Bretton Woods is underway, many of the measures now on the international agenda could, if followed through, add up to a significant buttressing of the system. They could make it more resilient, and thus potentially reduce the frequency and severity of crises. And they could provide clearer "rules of the game" for both creditors and debtors to deal with the consequences of a country not being able to meet all of its obligations in full and on time. Even though financial market conditions are now calmer, it is critical not to lose the momentum behind the reform process.

GLOSSARY OF TERMS

BCBS	Basel Committee on Banking Supervision
BIS	Bank for International Settlements
CCL	Contingent Credit Line
CGFS	Committee on the Global Financial System
CPSS	Committee on Payment and Settlement Systems
EME	Emerging Market Economy
FSA	Financial Services Authority
FSF	Financial Stability Forum
GDDS	General Data Dissemination Standard
HLI	Highly Leveraged Institution
IAIS	International Association of Insurance Supervisors
IAPC	International Auditing Practices Committee
IASC	International Accounting Standards Committee
IFAC	International Federation of Accountants
IFC	International Finance Corporation
IFI	International Financial Institution
IIF	Institute of International Finance
IMF	International Monetary Fund
INSOL	International Association of Insolvency Practitioners
IOSCO	International Organisation of Securities Commissioners
LTCM	Long Term Capital Management
OECD	Organisation for Economic Co-operation and Development
SDDS	Special Data Dissemination Standard
UNCITRAL	United Nations Commission on International Trade Law

Notes

1 A glossary of abbreviations used in this article is provided at the end.

2 The IMF recently issued a *Guide to Progress in Strengthening the Architecture of the International Financial System* which can be found at *www.imf.org/external/np/exr/facts/arch.htm*

3 These three Committees report to the G-10 Central Bank Governors.

4 Some key emerging market economies are also participating in the Working Groups.

5 To the School of Advance International Studies on 21 April. The full text of this speech can be found at *www.ustreas.gov/press/releases/pr3093.htm*

6 See for example, the 14 May 1999 speech by E A J George, Governor of the Bank of England, at *www.bankofengland.co.uk/speech40.htm*

7 See 20 May 1999 Testimony of Chairman Alan Greenspan before the Committee on Banking and Financial Services of the US House of Representatives, available at *www.bog.frb.fed.us/boarddocs/testimony/1999/19990520.htm*

8 See page 26-32 of the recent IMF publication "Involving the Private Sector in Forestalling and Resolving Financial Crises" available at *www.imf.org/external/pubs/ft/series/01/privsecp.pdf*

9 US Treasury Secretary, Robert Rubin, publicly gave his support to this proposal in his 21 April speech (see footnote 5).

10 These issues were also highlighted in the October 98 report of the Working Group on Strengthening Financial Systems, chaired by Mario Draghi of the Italian Ministry of Finance; pp10-20. Available at *www.imf.org/external/np/g22/sfsrep.pdf*

11 Further information on data standards, including the SDDS, is available at *www.dsbb.imf.org*

12 The full text of the Code, as well as the draft manual, the questionnaire and the model self-evaluation report are available at *www.imf.org/external/np/fad/trans/code.htm*

13 This Code is available at *www.imf.org/external/np/mae/mft/index.htm*

14 The IFC (the International Finance Corporation) is the arm of the World Bank that provides loans to, and invests in the equity of, private sector companies in developing countries.

15 At *www.bis.org/publ/bcbs30a.htm*

16 At *www.iosco.org*

17 Obtainable from IAIS Secretariat CH40002, Basel, Switzerland.

18 Prior to the transfer of banking supervisory responsibility from the Bank of England to the FSA, the UK's banking supervisory technical assistance was largely provided under the aegis of the Bank's 'Centre for Central Banking Studies'. With the transfer of supervisory responsibilities, bilateral technical assistance in this area is now arranged by the FSA. The Bank's CCBS continues to provide training and advice in the broader area of policies to promote financial stability and financial markets.

19 The full text is available at *www.oecd.org//news_and_events/corpgovprinciples.pdf*

20 While these standards have already been recognised by a number of major countries and stock exchanges, they have not yet been accepted by Canada and the United States. They are currently being examined by IOSCO.

21 At *www.IFAC.org*

22 Available at *www.ustreas.gov/press/releases/pr2192.htm*

23 The full texts of the G-22 Working Group reports can be found at *www/imf.org/external/np/g22/index.htm*.

24 Available at *www.imf.org/external/pubs/ft/series/02/index.htm*

25 See press release 69/99 of 21 April 1999 at *www.hm-treasury.gov.uk*

26 See *www.bis.org*. The UK is represented on the BCBS by the FSA and the Bank of England.

27 Available at *www.bis.org/publ/index.htm*

28 Long Term Capital Management (a large hedge fund) for which the Federal Reserve co-ordinated a support package provided by LTCM's major banks and counterparties in September 1998

29 The full report is available on *www.bis.org./publ/bcbs45.pdf*

30 The President's Task Force reported on April 99.

31 Available at *www.bis.org*

32 See *www.imf.org/external/np/sec/pr/1999/pr4914.htm* for the IMF press release on the CCL.

33 An IMF Quota is the capital subscription that each member must pay to the IMF on joining. The size of a country's quota is roughly related to its relative size in the world economy. Quotas are normally reviewed every five years. For a detailed description of quotas see *www.imf.org/external/np/exr/facts/quotas.htm)*.

34 Available at *www.imf.org/external/pubs/ft/series/01/index.htm*

35 Willem H Buiter — acting in a personal capacity, not in his role as a member of the Bank of England's Monetary Policy Committee — and Anne C Sibert, "UDROP (Universal Debt Rollover Option with a Penalty): A Small Contribution to the New International Financial Architecture" — 26 April 1999. This paper may be downloaded from *www.econ.cam.ac.uk/faculty/buiter/public.htm*

36 The World Bank and the various regional development banks — the Asian, Inter-American and African Development Banks and the European Bank for Reconstruction and Development.

37 See *www/iif/com/pressrel/1999pr2.html* for the IIF's summary of this proposal.

38 Eventually, in late December 1997,with the prospect of default looming, the monetary authorities in the major industrialised countries encouraged their respective banks to maintain their then levels of exposure while a permanent solution was negotiated: nearly $22bn of inter-bank claims were restructured into sovereign guaranteed bonds with maturities of one, two and three years.

39 E.g. Greenwood and Mercer "Considerations of international law" in "Crisis? What Crisis? Orderly Workouts for Sovereign Debtors": September 1995; and Radelet and Sachs 1998 "The East Asian Financial Crisis: Diagnosis, Remedies, Prospects". *Brookings Papers on Economic Activity* 1: 1-74.

40 Barry Eichengreen February 1999 "Towards a New International Financial Architecture: A Practical Post-Asia Agenda", *Institute for International Economics*.

41 According to World Bank estimates, in 1990 bonds accounted for $10.8bn (7.4 per cent) of total net financial flows to developing countries. This had increased to $42.6bn (11.8 per cent) in 1997 and $30.2bn (10.6 per cent) in 1998.

42 When a country decides to seek to reschedule its official debts, it seeks an agreement with the "Paris Club" of official creditors. All Paris Club agreements include a clause that requires the debtor country to seek comparability of treatment from its private sector creditors. If payments on bonds fall due during the period covered by the Paris Club agreement, the debtor country is generally expected to seek comparability of treatment from the holders of the relevant bonds, as well as from all its other private sector creditors, prior to the Paris Club agreement coming into effect. (e.g. Pakistan has recently been asked to seek comparability of treatment from all its private sector creditors, including its bondholders, in respect of payments falling due during the period covered by its Paris Club agreement.)

43 There is a summary of the report, and the option to download the whole report, at *www.bis.org/publ/gten03.htm*

44 Report of the G-22 Working Group on International Financial Crises available at *www.imf.org/external/np/g22/index.htm*

45 See for example pages 18 and 56 of the IMF publication of 15 April 1999, "Involving the Private Sector in Forestalling and Resolving Financial Crises" available at *imf.org/external/pubs/ft/series/01/privsecp.pdf*.

46 A standstill period is a common feature in national bankruptcy procedures.

47 The IMF Board approved lending into arrears in respect of sovereign debt owed to commercial banks in 1989, and last year the Board agreed to extend this policy to other types of debt on a case by case basis.

48 Because an amendment of the Articles would be needed to achieve this, which would require approval by national legislatures, even once such a decision had been taken it would take a long time to bring it into effect.

49 Available at *www.imf.org/external/np/g22/index.htm*

50 Can be ordered from *www.imf.org/external/pubs/cat*

51 In the UK, mechanisms based on law are supported by the London Approach which has been evolved by the banks, with considerable leadership from the Bank of England, as a widely used set of principles which govern how banks respond to news of serious financial difficulty in one their corporate customers. A number of emerging market countries have put in place mechanisms governing corporate workouts which are based, to a greater or lesser degree, on the principles of the London Approach; the Jakarta Initiative in Indonesia is a good example.

52 The full texts of the G-22 Working Group reports can be found at *www.imf.org/external/np/g22/index.htm*

53 The full text of the declaration can be found at *www.ustreas.gov/press/releases/pr2792.htm*

Annex 1

Summary of progress on the 35 items included in the December 1998 plan for implementation presented to G7 Heads of Government by their Finance Ministers

G-7 Commitments

1. Implementation of the IMF Quota increase by January 1999.	The Quota increase was implemented in January 1999. By March 15, 154 member countries, representing 95.6 per cent of total current quotas had consented to their quota increase.
2. Further consideration, in the context of the proposed enhanced IMF facility, of the appropriateness of bilateral contingent financing which might be provided on a case-by-case basis.	Decisions on whether to supplement amounts made available under the Contingent Credit Lines (CCL) with bilateral contingent financing will need to be considered on a case-by-case basis, as and when countries are granted CCLs.
3. Compliance with the IMF code of good practices on fiscal transparency, with the objective of completing this by the 1999 spring meetings.	The Manual on Fiscal Transparency is complete. At the 1999 IMF spring meetings, the Interim Committee encouraged all members to work towards improving fiscal transparency in line with this code.
4. Compliance with an internationally agreed code of best practices for monetary and financial policy transparency, according to a timetable we will agree once the code has been agreed.	A draft Code of Good Practices on Transparency in Monetary and Financial policies has now been issued for public comment. The Interim Committee called for the finalised code to be available as soon as possible and no later than the 1999 IMF Annual Meetings
5. Dissemination of regular and timely information on the aggregate foreign exchange liquidity position of our central governments and central banks by end-June 1999, and of the whole of the public sectors in our own economies according to a timetable we will agree.	The UK is on target to meet the deadline of publishing end-June data on the aggregate foreign exchange position of the Government and the Bank of England by the end of July.
6. Compliance with the existing IMF SDDS by the February 1999 G7 meeting, and with the strengthened SDDS by January 1999[1].	The G7 now all comply with the existing SDDS standards, as do 40 other countries. Work on adherence to the strengthened standard is progressing.
7. Report to G7 Heads on compliance of our private sectors with standards of transparency, including on sound corporate governance and accounting, by end-1999.	This deadline is still some months away.

8. Bringing together the key international institutions and national authorities involved in financial sector stability - we look forward to Hans Tietmeyer's recommendations by the February 1999 G7 meeting, and will strive for a consensus and to begin implementation of any agreed actions by the Köln Summit in June.	The Tietmeyer report called for the setting up of a Financial Stability Forum (FSF), bringing together national authorities, international institutions and international regulatory or expert groupings with responsibilities in the international financial stability area. This group first met on the 14 April — an initial representation drawn from G7 finance ministries, central banks, and regulatory agencies, and representatives of the international financial institutions — and agreed a work programme for the coming months.
9. Consideration of ways to strengthen regulation of financial sector institutions in our own countries; in particular examining the implications arising from the operation of leveraged international financial organisations, including hedge funds and offshore centres - report by the 1999 Spring Meetings, consensus on how to proceed by the Köln Summit.	Numerous groups are now considering issues relating to Highly Leveraged Institutions. The FSF has set up a Working Group examining the various initiatives underway. See section VI of the main article text and Box 4 for further information.
10. Consideration of ways to promote greater use of collective action clauses in bond issues- report by the February 1999 G7 meeting, consensus on how to proceed by the Koln Summit.	The issue is currently under active consideration by both the G7 and G10.
11. Report on progress in development of mechanisms for involving the private sector, including market-based contingency financing mechanisms, by the 1999 spring meetings.	The IMF published a paper on this issue, "Involving the Private Sector in Forestalling and Resolving Financial Crises", on 15 April 1999. It is available from the IMF website (www.imf.org). The debate continues.
Tasking the International Institutions	
12. IMF to report proposals for the establishment of an enhanced IMF facility which would provide a contingent short-term line of credit for countries pursuing strong IMF-approved policies, by the end of 1998.	Proposals were made by the deadline and, after considerable debate, on 25 April 1999 the IMF Board agreed to provide Contingent Credit Lines to countries following strong economic policies as a precautionary line of defence readily available against balance of payments crises which might arise from international financial contagion. (see section VIII of the main text).
13. IMF to complete a manual on Implementation of the Code of Good Practices on Fiscal Transparency by the 1999 spring meetings, and to begin surveillance of implementation of the Code thereafter.	The Code, along with a draft manual and questionnaire, was posted on the IMF external website in November 1998. The Executive Board approved a revised draft manual on fiscal transparency in April 1999. Pilot assessments of members' fiscal transparency have commenced.

14. IMF to work with the BIS, supported by a diverse group of central banks, and with other relevant organisations, on a code of best practices for monetary and financial policy transparency, with the objective of completing this by the 1999 spring meetings.	A draft Code of Good Practices on Transparency in Monetary and Financial policies is now complete. The Interim Committee called for the finalised code to be available as soon as possible and no later than the annual meetings (see Box 1).
15. IMF to reach decisions on steps to strengthen the SDDS by the 1999 spring meetings.	The IMF Board has agreed to strengthen SDDS data provision in the areas of debt and international reserves (see section II of the main text and Annex 2). It has also established procedures for monitoring observance of the Standard. Current subscribers have until 31 March 2000 to observe the revised standards for reserves. The latest Interim Committee Communiqué encourages non-subscribers to consider subscription.
16. The OECD, taking into account the views of the World Bank and other international regulatory organisations, to complete its code of principles of sound corporate governance by the May 1999 OECD Ministerial meeting.	The OECD has circulated draft principles of sound corporate governance, which were endorsed at the 26 May 1999 OECD Ministerial meeting. (They are available at www.oecd.org)
17. IASC to finalise by early 1999 a proposal for a full range of internationally agreed accounting standards. IOSCO, IAIS and Basel Committee to complete a timely review of these standards.	The IASC has now published a comprehensive set of International Accounting Standards. An IOSCO technical committee is evaluating these standards, and the BCBS is reviewing their relevance to banks.
18. Appropriate committees headquartered in the BIS, consulting with IOSCO, the OECD and other relevant bodies, to examine transparency and disclosure standards for private sector financial institutions involved in international capital flows, including hedge funds — preliminary findings by the 1999 spring meetings, formal report by the Köln Summit.	The G7 have endorsed the Basle Committee on Banking Supervision's recommendations on how to mitigate risks involved in dealing with Highly-Leveraged Institutions, including hedge funds. The G10 Central Banks' Committee on the Global Financial System has set up two working parties to look at transparency and disclosure issues in respect of capital flows; there are also other groups studying these issues. (See main text Section VI, and Box 4)
19. IMF, and standard-setting bodies, to prepare strategy for implementation and surveillance of all the above codes and standards by the 1999 annual meetings.	Strategies for implementation of standards and codes are under active development by the Fund and other relevant bodies.

20. IMF to publish transparency reports, beginning pilot assessments immediately, and finalising a structure for transparency reports by the 1999 annual meetings.	The IMF has carried out experimental transparency studies on Argentina and the UK, and the Australian authorities have published a self-assessment of their adherence to transparency standards. The Fund staff will now prepare a second round of transparency reports and initiate an outreach program to solicit reactions to the initial studies. Concrete proposals for transparency reports will go to the Fund Board in advance of the 1999 IMF annual meetings.
21. IMF, World Bank, OECD and international regulatory and supervisory organisations to provide technical assistance to help countries comply with the codes and standards. IMF and World Bank to prepare a joint paper on this strategy by the 1999 annual meetings.	The IMF, World Bank, OECD already have significant programmes of technical assistance and training, and these are increasingly being directed at helping countries to comply with codes and standards.
22. World Bank, together with the IMF and other multilateral development banks, to prepare an interim report on progress in establishing insolvency and debtor-creditor regimes, by the 1999 spring meetings.	The World Bank is now working with the International Association of Insolvency Practitioners and the International Bar Association on this issue. The World Bank is planning to convene an international symposium to discuss a set of draft principles and guidelines later this year. (See Section XV of the main text)
23. IMF to move ahead with its recently reaffirmed policy of lending into arrears and to consider extending this policy, under carefully designed conditions and on a case-by-case basis. G7 IMF Executive Directors report on progress by the 1999 spring meetings.	For **sovereign arrears** in February 1998 the IMF Board agreed to extend the 1989 policy on lending into commercial bank arrears to allow the Fund to lend into arrears to private bondholders and other private creditors on a case-by-case basis. The IMF Board also agreed to extend the 1989 policy to lend into **non-sovereign arrears** arising from the imposition of exchange controls on a case-by-case basis.
24. IFIs to play a constructive role in the process of orderly opening of the capital account in emerging economies.	At the 1999 IMF spring meetings the Interim Committee "encouraged the Fund to continue its work on the appropriate pace and sequencing of capital account opening and, in particular, to refine further its analysis of the experience of countries with the use of capital controls, and to explore further issues related to the Fund's role in an orderly and well-supported approach to capital account liberalisation".
25. World Bank and other relevant institutions to produce an interim report on progress towards development of principles of good practice in social policy, by the 1999 spring meetings.	Work is progressing in this area. The G7 have asked the World Bank, in conjunction with the IMF to draw up a set of principles which can ensure protection of the most vulnerable in society through good programme design. The World Bank's Comprehensive Development Framework (see www.worldbank.org), also stresses the links between social and structural development principles. Both the Chancellor of the Exchequer and the Secretary of State for International Development have stressed the importance of this issue.

26. IMF to continue including policies on trade liberalisation, elimination of state-directed lending on non-commercial terms to favoured industries, enterprises or institutions, and provision of non-discriminatory insolvency regimes, in its conditionality.	These items are now common features of IMF Structural Adjustment Programmes.
27 All IFIs, especially the IMF, immediately to adopt a presumption in favour of release of information, except where this might compromise confidentiality. IMF to prepare a report on its approach on this issue, by the 1999 spring meetings.	The IMF Board has agreed a presumption that all LOIs, MEFPs, and PFPs[2] would be released subject to a review after one year. It is also proceeding with the release of the Chairman's statements in UFR[3] cases, on the understanding that the question of UFR PINs would be revisited in six months. The IMF Board has also agreed to continue its policy of actively encouraging the use of PINs after each Article IV discussion. In addition, for the next 18 months Article IV reports will also be released on a voluntary basis as part of a pilot programme.
28. IMF to prepare a progress report on the development of a formal mechanism for systematic evaluation of the effectiveness of the Fund's operations, programmes, policies and procedures, by the 1999 spring meetings.	External evaluation panels are currently in the process of assessing IMF surveillance procedures and its research activities. Both panels are expected to report by June. After these two panels have reported the Fund plans to review its approach to evaluation.
Further Work	
29. Assessment of proposals to strengthen the Interim and Development Committees of the IMF and World Bank.	At its meeting in April the Interim Committee asked its Deputies and the Executive Board to explore further the scope of institutional improvements and to report to the September meeting of the Committee. The issue is also being considered in the G7.
30. Examination of scope for further strengthening of prudential regulation in industrialised countries.	Inter-alia, the Basel Committee on Banking Supervision is reviewing the 1988 Capital Accord with a view to making it more comprehensive in its coverage and more risk based. The BCBS has continued issuance of sound practice papers, including in areas of HLI lending and loan valuation. The Financial Stability Forum has been established to strengthen co-operation among the international organisations, regulatory associations, and other groups involved in financial regulation and oversight. This work applies to both industrialised and developing countries.
31. Further strengthening of prudential regulation and financial systems in emerging markets.	The work being carried out by the BCBS and others referred to above (item 30), applies to international banks in developing countries. The BCBS is also working actively to encourage implementation of its "Core Principles for Effective Banking Supervision".
32. Consideration of elements necessary for maintenance of sustainable emerging market exchange rate regimes.	At the 1999 spring meetings the Interim Committee asked the Executive Board to give further consideration to the issue of appropriate exchange rate arrangements, including in the context of large-scale official financing. The Executive Board will consider a staff study on the topic shortly.

33. Development of new ways to prevent and respond to crises, including new forms of official finance and improved methods to promote a greater role for the private sector in containing and resolving crises.	The development of internationally agreed codes and standards is a key element in improving crisis prevention. In addition the IMF has recently decided to offer Contingent Credit Lines. The eligibility criteria are set so as to encourage countries to adopt strong preventative measures (see section VIII of the main text).
34. Assessment of proposals for strengthening the IMF, so as to improve its programmes and procedures in crisis prevention and resolution, focusing in particular on conditionality issues.	Internationally agreed codes and standards could, in due course, prove to be a significant crisis prevention tool. Various options for widening the IMF's role in crisis resolution, beyond the provision of finance in exchange for adherence to conditionality, are under consideration (see sections XI to XIII of the main text).
35. Encouragement of policies that protect the most vulnerable in society.	The World Bank is developing principles of good practice in social policy, with the IMF and other international organisations also working on improving social safety nets.

Notes

1 The G7 has agreed that the strengthened SDDS should take effect by April 2000.

2 LOIs (Letters of Intent) and MEFPs (Memoranda of Economic and Financial Policies) are documents prepared by an IMF member country, which describe the policies that it intends to implement in the context of its request for financial support from the Fund. A PFP (Policy Framework Paper) is prepared by the member country in collaboration with the staffs of the IMF and World Bank, and describes the authorities economic objectives, macro-economic and structural policies for three-year adjustment programmes supported by EASF resources, as well as associated external financing needs and major sources of financing. It is renewed on an annual basis.

3 UFR is the use of Fund resources, and a PIN is a Press Information Notice.

Annex 2

IMF Special Data Dissemination Standard: Data Template on International Reserves/Foreign Currency Liquidity

(Information to be disclosed by the monetary authorities and other central government, excluding social security)[1] [2] [3]

I. Official reserve assets and other foreign currency assets (approximate market value)[4]

A. Official reserve assets

1. Foreign currency reserves (in convertible foreign currencies)

a. Securities

of which:

issuer headquartered in reporting country

b. total deposits with:

i. other central banks and BIS

ii. banks headquartered in the reporting country

of which:

located abroad

iii. banks headquartered outside the reporting country

of which: located in the reporting country

2. IMF reserve position

3. SDRs

4. Gold (including gold on loan)[5]

5. Other reserve assets (specify)

B. Other foreign currency assets (specify)

II. Predetermined short-term net drains on foreign currency assets (nominal value)

		Maturity breakdown (residual maturity)		
	Total	Up to 1 month	More than 1 month and up to 3 months	More than 3 months and up to 1 year
1. Foreign currency loans and securities[6]				
2. Aggregate short and long positions in forwards and futures in foreign currencies vis-a-vis the domestic currency (including the forward leg of currency swaps)[7]				
(a) Short positions				
(b) Long positions				
3. Other (specify)				

III.Contingent short-term net drains on foreign currency assets (nominal value)

	Maturity breakdown (residual maturity, where applicable)			
	Total	**Up to 1 month**	**More than 1 month and up to 3 months**	**More than 3 months and up to 1 year**
1. Contingent liabilities in foreign currency				
(a) Collateral guarantees on debt falling due within 1 year				
(b) Other contingent liabilities				
2. Foreign currency securities issued with embedded options (puttable bonds)[8]				
3. Undrawn, unconditional credit lines[9]				
(a) with other central banks				
(b) with banks and other financial institutions headquartered in the reporting country				
(c) with banks and other financial institutions headquartered outside the reporting country				
4. Aggregate short and long positions of options in foreign currencies vis-a-vis the domestic currency[10]				
(a) Short positions				
(i) Bought puts				
(ii) Written calls				
(b) Long positions				
(i) Bought calls				
(ii) Written puts				
PRO MEMORIA: In-the-money options[11]				
(1) At current exchange rates				
(a) Short position				
(b) Long position				
(2) + 5 % (appreciation of 5% of the domestic currency)				
(a) Short position				
(b) Long position				
(3) - 5 % (depreciation of 5% of the domestic currency)				
(a) Short position				
(b) Long position				
(4) +10 %				
(a) Short position				
(b) Long position				
(5) - 10 %				
(a) Short position				
(b) Long position				
(6) Other (specify)				

IV. Memo items

1. To be reported with standard periodicity and timeliness:[12]

   a. Short-term domestic currency debt indexed to the exchange rate

   b. Financial instruments denominated in foreign currency and settled by other means (e.g., in domestic currency)[13]

   c. Pledged assets[14]

   d. Securities lent and on repo[15]

   e. Financial derivative assets (net, marked to market)[16]

   f. Derivatives (forward, futures, or options contracts) that have a residual maturity greater than one year, which are subject to margin calls.

2. To be disclosed less frequently (e.g., once a year):
   (a) Currency composition of reserves (by groups of currencies)

Notes

1 In principle, only instruments denominated and settled in foreign currency (or those whose valuation is directly dependent on the exchange rate and that are settled in foreign currency) are to be included in categories I, II, and III of the template. Financial instruments denominated in foreign currency and settled in other ways (e.g., in domestic currency or commodities) are included as memo items under Section IV.

2 Netting of positions is allowed only if they have the same maturity, are against the same counterparty, and a master netting agreement is in place. Positions on organized exchanges could also be netted.

3 Monetary authorities defined according to the IMF Balance of Payments Manual, Fifth Edition.

4 In cases of large positions vis-a-vis institutions headquartered in the reporting country, in instruments other than deposits or securities, they should be reported as separate items.

5 The valuation basis for gold assets should be disclosed; ideally this would be done by showing the volume and price.

6 Including interest payments due within the corresponding time horizons. Foreign currency deposits held by nonresidents with central banks should also be included here. Securities referred to are those issued by the monetary authorities and the central government (excluding social security).

7 In the event that there are forward or futures positions with a residual maturity greater than one year, which could be subject to margin calls, these should be reported separately under Section IV.

8 Only bonds with a residual maturity greater than one year should be reported under this item, as those with shorter maturities will already be included in Section II, above.

9 Reporters should distinguish potential inflows and potential outflows resulting from contingent lines of credit and report them separately, in the specified format.

10 In the event that there are options positions with a residual maturity greater than one year, which could be subject to margin calls, these should be reported separately under Section IV.

11 These "stress-tests" are an encouraged, rather than a prescribed, category of information in the IMF's Special Data Dissemination Standard (SDDS). Could be disclosed in the form of a graph. As a rule, notional value should be reported. However, in the case of cash-settled options, the estimated future inflow/outflow should be disclosed. Positions are "in the money" or would be, under the assumed values.

12 Distinguish between assets and liabilities where applicable.

13 Identify types of instrument; the valuation principles should be the same as in Sections I-III. Where applicable, the notional value of nondeliverable forward positions should be shown in the same format as for the nominal value of deliverable forwards/futures in Section II.

14 Only assets included in Section I that are pledged should be reported here.

15 Assets that are lent or repoed should be reported here, whether or not they have been included in Section I of the template, along with any associated liabilities (in Section II). However, these should be reported in two separate categories, depending on whether or not they have been included in Section I. Similarly, securities that are borrowed or acquired under repo agreements should be reported as a separate item and treated symmetrically. Market values should be reported and the accounting treatment disclosed.

16 Identify types of instrument. The main characteristics of internal models used to calculate the market value should be disclosed.

Resolution of sovereign financial crises — evolution of the private sector restructuring process

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BACKGROUND There has been much discussion in the international financial community at the policy-maker level recently on the issues of avoiding and resolving sovereign financial crises. Much of that discussion has focussed on measures which can be put in place either to assist in preventing the occurrence of a financial crisis or to assist in the resolution of a financial crisis. Given the level of private sector involvement in the financing of flows of capital to the emerging markets, the private sector is inevitably germane in this debate. Not surprisingly, experience of the involvement of the private sector in the 1980's debt crisis has been drawn upon to seek parallels with the current position. In drawing those parallels, much emphasis has been placed on the change in the composition of the debt obligations owed to the private sector.

IN THE CONTEXT of this background, two important issues have arisen. First, because of the well-recorded shift in the emerging markets in favour of financing through the bond markets, attention has been focussed on provisions in bond documentation, particularly as compared with corresponding provisions in syndicated loan agreements. Secondly, as a result of the rapid development of the financial marketplace concerns have arisen over the influence other instruments are likely to have on any restructuring process which needs to be undertaken.

These two themes are addressed in this article.

INTERNATIONAL SOVEREIGN BONDS

The huge increase in the volume of borrowing through the bond markets was driven by many factors, including a desire on the part of borrowers to raise funds in the cheapest practicable manner and the desire of lenders to make funds available in a capital efficient manner.

Against the background of a significant relative shift in capital-raising away from syndicated credits in favour of bonds, the conclusion has been drawn that it is unrealistic to ignore the possibility that eurobonds may need, in appropriate cases, to be restructured. If this is the case then it is important to have a general understanding of both the broad manner in which the underlying legal documentation is constituted and also the holding and payment structures typically used in modern eurobond issues.

These two issues are addressed in Box 1 — Legal documentary structures — and Box 2 — Holding and payment structures under eurobonds.

Collective action clauses

As part of both, the discussion concerning useful preventative measures and measures to assist in resolving sovereign financial crises, the incorporation of so-called "collective action clauses" into bond issues has been discussed. There are three elements to these collective action clauses:

Bond term modification provisions These are targeted at the ability to amend payment terms through majority action. As described in Box 1, provisions with this effect are routinely included in English law eurobonds and routinely not included in New York law eurobonds;

Collective representation provisions These are designed to speed up a process through which a representative forum is established within which issuer and bondholder views

can be heard. Generally neither English law nor New York law governed eurobonds currently contain these provisions.

Sharing clauses These are designed to limit direct action against the issuer and to ensure that the sharing of proceeds with fellow bondholders acts as a deterrent to suit. These clauses are common in syndicated loans but not in eurobond documentation, where their inclusion would be likely to give rise to difficulties in practice. Despite not being included directly, sharing provisions may still pertain to English law eurobonds constituted under a trust deed. This is because, generally, the bondholder is unable to sue the issuer directly as the covenants of the issuer (including the covenant to make payments) are made with the trustee. If the trustee does sue and recover proceeds, these need to be shared (after deduction of certain priority payments such as the trustee's fees) with all bondholders on a pro rata basis.

The likely position in practice

However, this focus on collective action clauses stems from an implicit assumption that the legal terms under which debt instruments are constituted will be a significant factor in a payments crisis scenario.

As has been recorded elsewhere, often when faced with these difficulties in the past, many sovereign obligors have chosen to continue to honour their bond obligations (which typically represented a small proportion of the total stock of relevant debt). Presumably, the logic was that payments on that category of debt would be likely to ensure easier voluntary market access in the future. In the relevant evaluations to be made a balance would need to be struck between the cash-flow relief obtained by restructuring current payments and the likely extent of loss in the sovereign's access to private sector resources in the future.

If a sovereign obligor felt compelled to seek to restructure its international bonds then it is most likely that it would seek to do so in conjunction with the restructuring of other categories of debt. The position of the Paris Club of creditor governments is also likely to be of influence in this respect. Recent statements by Paris Club creditors suggest that the comparability provision would not always require eurobonds to be included in restructuring, but rather the issue will be considered on a case-by-case basis. Where eurobonds are relevant for comparability purposes, other categories of private-sector debt will inevitably also be included. It should also be remembered that there is often considerable diversity in the bond category itself.

The practical position likely to be faced is one in which the forms of debt obligations which a country is seeking to restructure are various. The range of debt instruments affected, the range of applicable laws governing those instruments and the range of rights which those debt instruments confer on individual creditors are all likely in practice to be highly diverse.

Further the sheer volume of relevant debt contracts involved is also likely to be a significant constraining factor in practice. An example may bring this point into focus: more than 10,000 separate debt claims were restructured in the London Club restructuring of the debts of the former Soviet Union which was completed in 1997.

In circumstances such as these the form of debt is not a major issue. Most obligors have not sought to scrutinise in careful detail the precise nature of the rights of its existing creditors. To do so would require extensive analysis under many systems of law.

The typical approach taken for resolving private-sector debt has therefore been to seek, at the aggregate payment level, the amount of funds which could be paid as contrasted with those which are contracted to be paid within a relevant period of time. The deal is then grafted around that financial constraint, which is obviously the subject of some considerable discussion. Restructuring terms affecting all applicable classes of debt are then offered to the creditors of the relevant instruments, perhaps with the benefit of a menu approach. Those restructuring terms effectively represent an offer from the obligor to restructure the terms on the basis described. Much time and energy is spent by obligors and creditors alike in seeking to agree the correct levels of creditors' claims through a reconciliation process which is often complicated by interest arrears and secondary market trading.

Some commentators have suggested that because of the shift in sovereign indebtedness away from syndicated credits and into bonds it would be difficult to replicate the successful sovereign restructurings of the 1980s. The reason given for this is that the legal rights granted to a creditor under a bond are in some sense more individual and "stronger" than those created under a syndicated credit. The writer does not subscribe to this view. The "additional" rights given to a bondholder are not in practice very significant and, in any event, in the 1980s, commercial banks with bilateral credits participated in debt restructurings with very few exceptions regardless of the fact that their legal rights would have been significantly "stronger"than either a syndicate member or a bondholder.

Box 1 Legal documentary structures

In terms of volume, most international bond issues have been in the form of English law and New York law governed eurobonds. However, issues into the German, Japanese, Swiss and other domestic markets, governed by relevant local law, have also been seen.

English and New York Law governed eurobond structures

In English law governed eurobond transactions there are two commonly-used legal documentary structures, namely a trust deed and a fiscal agency structure with no trustee.

Under the English law trust deed structure, the issuer enters into covenants in favour of the trustee including, most importantly, the covenant to repay principal and to pay interest on the bonds. The trustee then holds the benefit of these covenants on trust for the bondholders. The trustee is a corporate body appointed by the issuer whose function is to represent the interests of the bondholders on terms which are set out in considerable detail in the trust deed. The trustee is ultimately answerable to the bondholders. It will be interesting to see how this structure develops following the enactment of the Third Party Contract Rights Bill, which will introduce into English law the ability to enter into contracts for the benefit of a third party.

Under the English law fiscal agency structure, covenants of the issuer are given directly to the bondholders. The fiscal agent performs little more than a paying agency function and is the agent of the issuer. The fiscal agent will be appointed by the issuer under a fiscal agency agreement, which generally states that the fiscal agent has no relationship of agency or trust for or with the bondholders.

Hence whilst the trustee is the representative of the bond holders and owes its duty to them, the fiscal agent is the agent of the issuer and its administrative functions are performed on the issuer's behalf.

Generally, US law governed bonds are structured in a similar manner. In bonds where a trustee is involved, the bonds are issued under an indenture between the issuer and the trustee which sets out the terms under which the trustees operate and function. The trustee represents the holders of the debt instruments issued under the indenture and owes various duties including fiduciary duties to the holders of those debt instruments.

Under the US Trust Indenture Act of 1939 (TIA), which broadly only applies to non-sovereign bonds offered for public sale in the US, a trustee is required and certain mandatory powers and duties are imposed upon the trustee.

Where a trustee is not required under the TIA, for instance in the case of bonds issued or guaranteed by foreign sovereigns and other official entities or those which are privately placed or placed outside the US, a fiscal agency structure may be used. The vast majority of sovereign eurobonds issued in the American style use fiscal agents rather than trustees and tend to be governed by New York law.

As with the English law structure, the fiscal agent is the agent of the issuer and effectively performs servicing debt duties on behalf of the issuer under a fiscal agency agreement and does not represent the bondholders.

However, the practical implications of using a trustee in the US model are different from those in the English model (see below).

Bond modification provisions in eurobonds

Under both the English law trust deed and fiscal agency agreement structures, bond modification clauses are typically incorporated through the provisions relating to meetings and resolutions of bondholders.

Under these provisions it is usually the case that payment terms can be amended, in a manner which is binding on all bondholders (including those who vote against or abstain), by a two-thirds or three-quarters majority by value of those voting at a meeting which has a (generally enhanced) quorum present and has been properly convened.

Provisions in New York law governed eurobonds concerning bond modification provisions tend to follow the pattern required under the TIA, even where that Act does not apply. Under this approach, in order for the payment terms on a bond to be revised, the consent of the holder of that bond must be obtained and cannot be imposed by majority decision.

Brady bonds, whether written under English law or US law, use the American style on bond modification provisions.

Individual and collective rights

Two areas are of relevance in this context, namely the right to sue for overdue amounts and acceleration.

Under the English law trustee structure the right of an individual debt holder to sue is heavily restricted. As a result of the structure used it is only the trustee who may sue and direct actions by a bondholder are essentially only possible in circumstances where the trustee is required to act by a specified proportion of the bondholders and has failed to do so. If a trustee does sue the proceeds generally must be shared with all bondholders (after deduction of certain priority items) on a *pro rata* basis.

By contrast, under the US trustee structure, the existence of a trustee does little to restrict or limit the rights of individual bondholders. Again, the pattern required under the TIA is generally followed and an individual debt holder can always sue for overdue amounts of principal or interest.

Under both English law and New York law eurobond structures, generally;

- Acceleration in trustee structures requires a vote of bondholders holding some minimum amount of principal (eg 25 per cent). Under English law structures the trustee often has a discretion to accelerate even if a vote has not been taken.

- With some fiscal agency structures each individual bondholder has the right to accelerate his own bonds upon the occurrence of an event of default. In others, a vote of bondholders holding some minimum amount of principal (again 25 per cent is common) is required.

If the restructuring process in the late 1990s does prove to be more difficult than it was in the 1980s, this will not be because of legal differences but because of the change in the nature of the creditors and, perhaps, more complex inter-creditor issues. In the 1980s most debt was held by commercial banks, now the investor base is much wider. This is true both for bonds and debt which originated as commercial bank debt which, as a result of repackaging and secondary market trading, is now typically held by a broad investor base.

THE INCREASE IN COMPLEXITY IN THE MARKET PLACE

Policy makers are concerned that the range of obligations owed to private sector participants may create considerably greater complexity in the voluntary resolution of sovereign financial crises so far as the private sector is concerned. New types of instrument which have become relevant, in addition to eurobonds, are:

- Participations, securitisation and other repackaging arrangements.

- Credit derivatives.

- Interest rate and currency swaps and currency-related derivatives.

Some of these instruments, such as foreign exchange swaps, have been seen in the market place for many years but are becoming part of the restructuring debate. Others, such as credit derivatives, represent recent financial innovations.

Participations, securitisations and other repackaging arrangements

The main factors contributing to developments in this area have been, from the creditor perspective, risk management and regulatory capital requirements. They have resulted in increased liquidity and hence finer pricing from the debtor perspective. Many different structures have been used with ranging degrees of complexity. For instance, a participation arrangement under which a lender's economic interest in a syndicated loan is passed on to a different institution, which also funds that asset, has been a structure routinely used in the market place for many years. Several more sophisticated arrangements pursuant to which the economic interest in a primary asset is passed on to other "investors" have been used and developed over time.

The range of assets which have been the subject of these arrangements is also considerable and now extends to the overwhelming majority of financial assets. Repackaging techniques through the issuance of secured notes by a multi-seller repackaging vehicle represents a relatively recent development in the same broad context.

Repackaging has become big business, with most significant financial intermediaries having one or more repackaging programmes. The relevance of the instruments under this broad heading in the restructuring arena is that a two-tier structure (at least) is created.

The parties which hold as creditors — either through a loan or other debt instrument, and have created an

Box 2 Holding and payment structures under eurobonds

Global notes and clearing systems

Typically eurobond documentation is written on the basis that definitive bond certificates may be issued. However, it is now usual practice for global bonds to be held on behalf of a clearing system or systems and for interests in those global bonds to be held in book-entry form through the relevant clearing system or systems.

In this case, definitive bonds generally are not issued, for reasons predominately associated with convenience and cost, unless and until certain specified (and unlikely) events occur (for instance the imposition of a withholding tax). Under English and New York law structures there are actually two types of bonds, namely, bearer bonds which are transferable by delivery and registered bonds which are transferred through a register and have certificates issued to the registered holders. The register and not the certificate is basically determinative in terms of title.

Most modern eurobond issues remain in "global" form. In this case one or more "global" instruments representing the whole issue or a relevant part of it are held by a custodian. In cases where there is no placement into the US the custodian will be a so-called "common depository" which holds for the two most frequently used European clearing systems namely Euroclear and Cedelbank.

These two clearing systems operate custody and clearing arrangements which are designed to eliminate the need for physical delivery of securities on each occasion when the securities are traded. In practice, an investor will have access to two accounts with the clearing system; these are a cash account, through which all payments pass, and a securities account, to and from which securities are delivered. Settlement is effected through book entries in the relevant clearing system. Euroclear and Cedelbank have procedures for settlement of transactions between themselves where one party maintains an account in Euroclear and the other in Cedelbank.

However, many investors do not maintain accounts of their own with the clearing systems. In such cases the bonds are credited to an account which the investors' bank or broker has with the clearing system and that bank or broker holds the instruments as nominee for the true investor. In theory investors could take physical delivery of their bonds in the full knowledge that procedures for trading become more difficult (although this obviously will not happen in practice if the issue is to remain in global form).

Many eurobonds are now placed in part with investors in the US, without SEC registration. This is done in reliance on private placement and permitted resale rules promulgated by the SEC under the US Securities Act of 1933. In such cases there is typically a clearing system for the US holders and this is invariably The Depository Trust Company ("DTC"). DTC operates in a manner similar to Euroclear and Cedelbank, with transfers of interests and payments being effected through book entries. Typically a single institution which acts as custodian on behalf of DTC will hold instruments in global form to avoid the need for individual certificates. Trading of interests held through DTC takes place through major financial institutions which act as "DTC Participants" and who hold interests in the global instruments on behalf of their clients. Subject to applicable US securities laws, trading may occur between accounts held through DTC and Euroclear and Cedelbank.

The account entries at DTC, Euroclear and Cedelbank are confidential and generally not made available to an issuer. Provision of this information would not, in any event, reveal the true extent of "beneficial interest" in the applicable bonds because, as mentioned above, many investors hold their interest directly or indirectly through their banks who themselves maintain accounts with those systems.

Flow of funds

Generally, payments on eurobonds are made by financial institutions which are constituted as paying agents of the issuer. These institutions typically are not required to make payments unless they, or a main co-ordinating paying agent, have been put in funds by the issuer.

Payments in relation to bearer bonds are made against presentation of the relevant coupon or, in certain circumstances, the bond itself. Payments in respect of registered bonds are made to the holders listed in the register on a specified record date (which is shortly prior to the relevant payment date).

This structure translates in practice into a paying agent making payments to the applicable global noteholder. This will be either the common depository for Euroclear and

Cedelbank or the custodian for DTC. That holder will then ensure that the appropriate amounts of funds are credited to the correct cash accounts maintained at the relevant clearing systems.

In the case of non-payment it is the paying agents that will initially notify the applicable global bondholder that payment will not be forthcoming.

Issuers seeking a co-ordinated restructuring of payment obligations may seek to make contact with the bondholders through the notification procedures set out in the terms and conditions of the bonds. Typically valid notices can be given by mailing, in the case of registered instruments, and publication in specified newspapers. Whilst reflective of the documentary provisions such an approach is unlikely of itself to meet with much success, particularly if contact is sought in advance of an actual payment default.

In practice most effective contact is likely to be made through seeking to use the clearing systems and indeed more recent eurobond documentation often provides for this so long as the bonds remain in global form. They have shown themselves willing to assist by seeking to ensure that relevant notices are made available to participants in the clearing systems which maintain a securities account; they will typically need to have relevant identification numbers for the securities issues in question. This has enabled contact, at least at the level of the securities account holder (rather than directly with those for whom that person may hold as nominee), whilst respecting the confidentiality of the holdings in the clearing systems.

economic interest in favour of other investors — would need to take into account not only their own institutional interest but also the position of their end investor in any rescheduling evaluations.

The creditor would need to ensure that it did not prejudice its position with the end investor on the basis of pure legal fiduciary responsibilities or, perhaps more likely in practice, on reputational grounds, particularly if the financial intermediary wished to continue to deal with those end investors in the future. These issues will have a bearing on creditor behaviour and therefore need to be understood by sovereign obligors and other decision makers.

Credit derivatives

In their broadest sense, credit derivatives are a mechanism for allocating different risks associated with a transaction to parties interested in taking those risks. Much has been written on credit derivatives and much standard documentation has been used in the market place prepared under the auspices of the International Swap Dealers Association (ISDA).

In the emerging markets three common types of credit derivative have been routinely seen, namely credit default products, credit linked notes and total return swaps.

Credit default products Stripping away a number of the legal issues, a useful way to think of a credit default product is one in which the buyer of the product is acquiring credit protection from the seller. In economic, as opposed to legal, terms this is similar to a guarantee provided by the seller. On the occurrence of a specified "credit event" the seller will be required to make a payment to the buyer. These instruments have been used by buyers to ameliorate balance sheet constraints. The protection acquired can be by reference to a single underlying asset or on a portfolio basis and the protection can also be, and often is, sold. Clearly these instruments become of relevance in circumstances where there is an underlying payment default and the credit default product is triggered. After the seller has paid out one of two things can occur. Either the underlying asset by reference to which the protection is acquired will move to the seller (this occurs if the arrangement is "physically settled"), or, alternatively, if the arrangement is "cash settled" then the payment made will be reduced by the then market value of the underlying asset. That asset will therefore remain with the buyer in those circumstances.

Credit linked notes Credit linked notes are essentially a mechanism under which the total yield on an underlying financial asset, together with the risk of any movement in the market value of that asset is passed from the seller to the buyer for a specified period. These instruments have been used heavily in connection with local currency debt instruments (such as the Russian GKOs). Typically there are various tax, regulatory and legal hurdles associated with purchasing local currency debt instruments directly and accordingly the end investor acquires an interest through a financial intermediary who has invested the necessary time, cost and energy in overcoming those hurdles. In essence, under a simple structure, the end investor purchases an instrument (the credit linked note) which is usually

dollar-denominated from the financial intermediary. The subscription proceeds for that instrument should be sufficient to enable the financial intermediary to acquire the underlying local market asset. The financial intermediary would either take or cover exchange rate risk through forward foreign exchange arrangements to convert the anticipated local currency proceeds into dollars at a pre-specified exchange rate.

Total return swaps These can be used to achieve similar economic results to those of credit linked notes but do not require the investor to fund its position at the outset. In essence, therefore, the end investor borrows from the financial intermediary an amount equivalent to the amount it would have had to pay for a credit linked note. As with credit linked notes, the credit risk of the issuer of the underlying asset (and often associated hedging arrangements) rests with the end investor.

The issues raised by the credit linked note and the total return swap are essentially similar to those raised by the repackaging instrument, namely the two-tier structure and the need for the creditor to have regard to the end investor. The effects of credit-default products on creditor behaviour are more ambiguous. The important issue is to recognise that they are likely to exist and may have an influence on creditor behaviour.

Interest rate and currency swaps

The position on default in connection with currency-swap and interest-rate swap arrangements is often brought into play in the restructuring context, particularly in circumstances in which the local banking sector of the relevant sovereign is linked with, or part of, attempted restructuring arrangements.

The formal documentation relating to these instruments has become largely standardised and ISDA has approved and periodically updates standard Master Agreements which are typically put in place between contracting counterparties.

Under these arrangements a large volume of separate deals with payment flows moving in either direction over time therefore tend to be regulated under the same standard Master Agreement. In circumstances where payment default occurs, the Master Agreement will provide remedies which can affect not just the payment flows on the trade in respect of which a payment has not been made but also all other payment flows regulated by that ISDA Master Agreement.

Typically the most usual remedy under the ISDA Master Agreement is that of close-out (where all marked-to-market positions are netted and settled immediately) pursuant to which a net sum under the entire Master Agreement can be crystallised. If close-out were to occur immediately following the onset of a financial crisis the market may have overshot on the exchange rate front and in these circumstances very significant losses from the host country debtors could be crystallised. Close-out could, therefore, be occurring at the worst time for all concerned. In these circumstances it would be appropriate to consider whether it would be helpful to develop other solutions to deal with the problem.

Again, the important issue for decision makers is to be mindful of the potential position following close-out and to have that under consideration when designing measures to seek to restore the viability of the local banking sector.

The restructuring process

There are, indeed, more instruments to consider in the restructuring context and this has led to the need to consider new issues.

The London Club Advisory Committee process, which evolved in the 1980s, has proved itself a flexible creature. As long as relevant decision makers, including the sovereign obligors themselves, take the new issues into account the restructuring process should remain manageable through market based solutions. Recent experience confirms this view.

Sovereigns which are in difficulties need to engage their creditors in a constructive process of discussion and negotiation at an early stage but in so doing need to recognise that the environment is now significantly different from that in the 1980s. It is necessary that the discussions are undertaken with a truly representative body of the much wider spectrum of investors. This wider body of investors will have a more diverse range of interests in the outcome of the discussions and flexibility with a range of solutions is likely to be required.

It is unfortunately the case that very often economic crisis is also accompanied by political difficulties which can mean that effective decision-making and implementation of decisions by the sovereign can be troublesome. However, if the creditor community is not to be alienated it is necessary that there is an early engagement in constructive dialogue. That process needs now even more so than in the 1980s to be conducted on as inclusive an approach as is practicable.

Will bank recapitalisation boost domestic demand in Japan?

Glenn Hoggarth, Regulatory Policy Division, and Joe Thomas, Financial Intermediaries Division, Bank of England[1]

Following four decades of unprecedented economic expansion, Japan has experienced sluggish growth in GDP and domestic demand since the early 1990s, with a marked decline in asset prices and the near elimination of measured price inflation. The weak economic situation has been accompanied by a slowdown in the growth of bank lending to the private sector. The economy has deteriorated further since the end of 1997. Indeed, since then, both output and bank lending have been contracting (see Table 1). This pattern has raised the question of whether the slowdown in bank lending is attributable to a lower *supply of credit*, reflecting either the banks' concerns over credit quality or tighter constraints on how much banks can lend, or lower *demand*, due to the weakening of the real economy.

THE APPROPRIATE policy response to the economic difficulties in Japan depends to a degree on which of those possible explanations is correct. If weakness in the balance sheets of the banks or inadequate deposit inflows have led to a cut-back in lending, reducing spending by the corporate and household sectors, then strengthening the capitalisation of the banking system would tend to increase output. If, on the other hand, weak bank lending reflects either reduced supply caused by concerns about credit quality or a lack of demand, then it is less important on macroeconomic grounds to encourage an increase in the capacity to lend by restructuring the banking system, particularly in the near term. In the longer term, however, such restructuring should boost output by improving the efficiency of the banking system. This article considers whether the evidence allows discrimination amongst the different explanations of lending behaviour in Japan.

The recent slowdown in the growth of bank credit

Possible causes

There are three broad hypotheses that could potentially explain the sharp decline of bank credit in Japan during 1998 and into 1999:

- a continued decline in the demand for credit by businesses and households (H1);
- a decline in credit supply because banks have become constrained by insufficient capital and/or low deposit inflows (H2). To meet regulatory standards of capital adequacy, banks may have chosen to reduce lending rather than raise capital, for example if they have found the price demanded by financial markets for bank equity and subordinated debt too high;
- a decline in credit supply by banks in response to concerns about borrower credit quality (H3). Given the structure of the market in Japan, it may not be possible for banks to increase spreads sufficiently to cover higher risk, or compensate for any reduction in lenders' appetite for risk. And banks may not be in a sufficiently strong financial position to bear higher risks of default if they cannot increase spreads. A more rigorous approach to credit assessment might also have been adopted if banks concluded that the government or central bank would take a tougher stand over bail-outs. Such a change in expectations might have followed the series of high-profile financial institution failures of Hokkaido Takushoku Bank, Sanyo Securities and Yamaichi Securities in November 1997[2]. The current low nominal interest rates in Japan have also squeezed the real profits earned on non-interest bearing deposits (reducing the benefit from the so-called

Table 1 General economic indicators in Japan (annual percentage change other than the exchange rate)

Year	Real GDP	Consumer prices	Bank lending to the private sector	Commercial property prices	Nikkei 225	US$/Yen
1988	6.2	0.7	10.2	3.0	39.9	125.9
1989	4.8	2.3	10.8	4.8	29.0	143.4
1990	5.1	3.1	7.5	4.1	-38.7	135.4
1991	3.8	3.3	4.4	-6.9	-3.6	125.3
1992	1.0	1.7	2.4	-19.0	-26.4	124.7
1993	0.3	1.2	1.3	-18.3	2.9	111.9
1994	0.6	0.7	0.1	-16.4	13.2	99.8
1995	1.5	-0.1	1.3	-17.2	0.7	102.9
1996	5.1	0.1	0.4	-13.2	-2.6	116.0
1997	1.4	1.7	1.0	-8.2	-21.2	129.9
1998	-2.8	0.6	-4.7	-10.1	-9.3	115.2

Source: Key Statistics and Table 54, Bank of Japan *Economic Statistics Monthly* (February 1999), Bank for International Settlements. Real GDP growth and consumer price inflation are yearly averages. The US$/Yen rate, and the annual per cent change in the Nikkei 225 and in nominal property prices are year-end figures.

endowment effect). The shift in the supply of credit may have manifested itself partly in a tightening of lending terms.

These three hypotheses are not mutually exclusive. For example, a stricter supervisory regime may have reduced both the ability of banks to lend and their willingness to do so.

The different hypotheses are shown in Figure 1. H1 corresponds to a leftward shift in the demand for credit from D0 to D1 (see Figure 1(a)), while both H2 and H3 would be reflected in a leftward shift in the supply of credit from S0 to S1 (see Figure 1(b)). The demand curve for loans D1 is drawn steeper than D0 to reflect the possibility of a recent fall in the sensitivity of loan demand in Japan to changes in lending rates (or other conditions of a loan). If confidence has weakened, a given reduction in lending rates or a relaxation in other conditions of the loan would tend to boost private sector demand for loans less than before.

Figure 1: (a) Decline in demand for credit (H1)

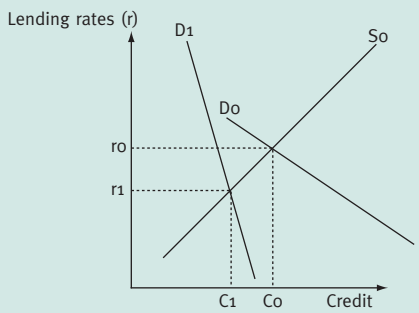
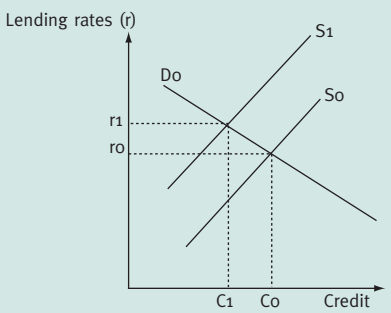


Figure 1: (b) Decline in supply of credit (H2 or H3)



Note: For unchanged official interest rates, the "supply of credit" curve is upward sloping with respect to the lending rate.

Recent policy measures

There is a widespread opinion in both public and private circles in Japan that the economy is suffering from a form of credit crunch (H2), and that the economy has in part deteriorated as a result of the weakness in the banking sector. There has been a substantial weakening in the capital position of Japanese banks because of poor loan quality and a substantial decline in the market value of banks' securities holdings.

Also, the marked depreciation of the yen in the first half of 1998 increased the value of banks' foreign-currency assets measured in yen terms. This further reduced the ratios of banks' capital to their (risk-weighted) assets.

Banks have had to react to this weakness both because regulators have imposed more rigorous capital standards and because financial markets have become more concerned about their capitalisation.

The regulators introduced 'prompt corrective action' (PCA) in April 1998. To be classified as adequately capitalised, banks must now have a risk-assets ratio (the ratio of capital to risk-weighted assets, or RAR)[3] of not less than 4 per cent if they operate in domestic markets alone and 8 per cent (the Basel minimum standard) if they operate internationally. Banks with capital below these thresholds are required to introduce a programme designed to increase capital and/or reduce assets. All financial institutions are required to produce audited financial statements based on a self-assessment of their loan portfolios, and conduct provisioning and write-offs according to minimum standards set by the Japanese Financial Supervision Agency (JFSA). Since July 1998, the JFSA and the Bank of Japan have been carrying out special inspections to review asset quality.

In March 1998, the government injected ¥1.8 trillion (0.4 per cent of GDP) of public funds into the banking sector, mainly in the form of subordinated loans (which banks are allowed to count as capital). Each of the major banks applied for around ¥100 billion, apparently irrespective of their relative strength or weakness; it appears that the government was reluctant to separate out the weakest banks. In October 1998, with the passing of the *Financial Revitalisation Law, the Financial Early Strengthening Law* and the amendment to the *Deposit Insurance Law*, the Japanese government embarked on another, much larger, recapitalisation programme. It provided for an additional ¥60 trillion (12 per cent of GDP) to be set aside for the banking sector: ¥25 trillion (5 per cent of GDP) for recapitalising weak but solvent banks; ¥18 trillion (3.6 per cent of GDP) to deal with banks that the JFSA found to be insolvent; and ¥17 trillion to guarantee deposits (see below). The measures also provided for the formation of a *Financial Revitalisation Committee* to oversee the restructuring process. The Minister for Financial Reconstruction, currently Hakuo Yanagisawa, chairs the committee.

By the end of March 1999, the major banks had applied for ¥7.5 trillion (1.5 per cent of GDP)[4]. Each bank has issued preferred shares to and/or received subordinated loans from the Deposit Insurance Corporation[5]. The amounts injected into different banks vary from ¥150 billion to ¥1 trillion. The terms of the preferred issue also vary[6], signalling that the government is now differentiating between the weaker and the stronger banks. In return, Japanese banks have submitted substantial restructuring programmes to the Financial Revitalisation Committee. These programmes include some reduction in staff numbers (around 20,000 over three years, saving around 11 per cent in payroll expenses), office and branch closures (around 450, or 10 per cent of the total number of branches), and withdrawal from overseas business.

In addition to the injection of government funds, banks have raised ¥2.1 trillion through the issuance of equity and subordinated-loan instruments, mainly to business (*keiretsu*) affiliates. In total, the banks have received ¥9.6 trillion (1.9 per cent of GDP). Despite writing off more than ¥10 trillion of bad debts in the financial year to March 1999, the government has been satisfied that these funds are sufficient to allow banks to meet the minimum regulatory capital standards. All the major banks had an RAR of 10 per cent or more at the end of the last financial year (March 1999); the average was around 11.8 per cent. Without the government funds for recapitalisation, ceteris paribus, the average RAR would probably have been around 8½ per cent[7].

However, there is speculation in the private sector that the funds available for recapitalisation are still insufficient to allow banks to increase lending significantly. Given the weak state of the economy, more loans may turn bad during the current financial year.

The evidence

Does the limited evidence available allow us to determine which of the three competing hypotheses H1, H2 and H3 outlined above has the most explanatory power? The answer is important in determining whether bank recapitalisation can help to boost domestic demand. H1 would imply a limited impact on the amount of credit

Table 2 Three-month (per cent) growth in loans and discounts at domestic banks (twelve-month growth rates in italics)

	Total		Trust banks		LTCBs		City banks		Regional banks I		Regional banks II	
1997 December	1.1	*Nil*	-0.1	*-4.4*	0.3	*-3.0*	1.2	*0.4*	1.6	*1.3*	0.8	*0.7*
1998 March	-1.2	*-1.6*	-2.7	*-6.1*	-3.7	*-7.5*	-1.4	*-1.4*	0.3	*0.4*	-1.2	*0.1*
June	-2.6	*-2.3*	-2.8	*-6.8*	-2.9	*-8.0*	-2.2	*-2.0*	-3.1	*-1.2*	-2.1	*-0.4*
September	*Nil*	*-2.7*	-1.5	*-7.0*	-1.5	*-7.4*	-0.2	*-2.6*	1.2	*0.5*	0.3	*Nil*
December	-0.1	*-4.7*	-2.7	*-9.4*	-1.4	*-9.0*	-2.9	*-6.7*	1.6	*1.0*	3.8	*2.6*
1999 March	-0.3	*-3.9*	-0.8	*-7.6*	-1.0	*-6.6*	-0.7	*-6.3*	-0.7	*-0.2*	-0.1	*1.6*

Source: Table 54, *Economic Statistics Monthly* (various issues), Bank of Japan. Regional banks II were the former *soga* banks — non-bank financial institutions which specialised in small-business finance. Regional banks II are generally smaller than Regional banks I.

Table 3 Lending spreads (percentage points)

	Total	Trust banks	LTCBs	City banks	Regional banks I	Regional banks II
1996 Year-end	1.91	1.55	2.23	1.74	1.97	2.53
1997 Year-end	1.73	1.39	1.87	1.57	1.82	2.30
1998 March	1.57	1.30	1.67	1.42	1.67	2.13
June	1.69	1.37	1.71	1.53	1.82	2.31
September	1.57	1.28	1.56	1.41	1.69	2.19
December	1.47	1.13	1.44	1.30	1.60	2.07
1999 March	1.83	1.52	1.76	1.65	1.99	2.49

Source: Table 50, *Economic Statistics Monthly*, April 1999, Bank of Japan. The lending spread is the difference between bank lending rates and the three-month call rate. The bank lending rate is a weighted average of rates on outstanding loans and discounts.

granted. If private-sector confidence is weak, borrowers will tend to be insensitive to an outward shift in the supply of loans. A reduction in lending rates, or relaxation in other loan terms (given that nominal rates are close to zero), might have little effect on demand. Hypothesis H2 implies that recapitalisation would ease constraints on lending, thus potentially increasing domestic demand. H3 implies that recapitalisation would have a smaller effect on lending to the Japanese private sector, because the strengthened banks might choose not to increase their lending.

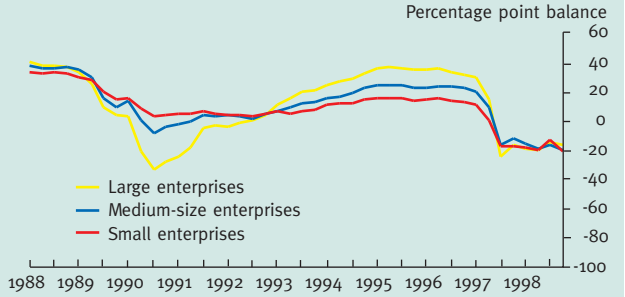
Can recent credit growth be explained entirely by demand factors?

The Japanese household sector has traditionally had a high propensity to save. That tendency has probably been increased by a widespread perception that wealth has been depleted by the sharp fall in asset prices and needs to be replenished, given concerns about future pension provision and employment prospects. Throughout the 1990s, the growth in private consumption has been sluggish by historical standards, while survey evidence indicates that consumer confidence remains weak[8]. Also, many corporates appear to have cut their spending on investment over the past two years. The Tankan Survey shows that since March 1997 there has been a marked increase in the percentage of manufacturing firms which believe there is overcapacity in particular product markets, and stocks of finished goods have increased sharply. Furthermore, many companies, small and large, in both manufacturing and non-manufacturing, think that business conditions have deteriorated markedly since

mid-1997. This weakness of private domestic demand seems to have been the most important cause of weakness of Japanese GDP growth in recent years, reinforced by the impact of crises in Asia's emerging-market economies on export demand.

Nonetheless, there is some evidence that, since the beginning of 1998, some corporates have demanded more loans than Japanese banks have been prepared to provide at prevailing spreads and interest rates (for reasons H2 and/or H3). Lending fell from the beginning of last year (see Table 2) while, until this March, lending spreads — the difference between bank lending rates and short-term market rates — set by the main groups of banks had fallen a little rather than risen (see Table 3)[9]. But survey evidence suggests that banks' other loan conditions have tightened significantly since late 1997. The 1999Q1 Tankan Survey showed that the balance of enterprises who think that the banks' lending stance is 'accommodative' minus those who think that it is 'severe' was at its lowest level since the 1970s for small and medium-sized firms, and at its lowest since 1990 for large firms (see Chart 1).

Chart 1 Tankan Survey of Japanese corporations' views on the lending attitude of financial institutions ('accommodative — severe' in percentage points) 1988Q1-1999Q1



Source: Table 93, Economic Statistics Monthly, various issues; Monthly Report on Economic Developments; both Bank of Japan.

Second, the corporate sector as a whole has markedly increased its borrowing from other sources. Government-sector banks have sharply increased their lending to the private sector, thus making up some of the shortfall in private lending. In October 1998 the government announced that it would guarantee loans of up to ¥20 trillion (4 per cent of GDP) to help small and medium-sized companies obtain funds from apparently reluctant banks. It will take over loans in the event of firms defaulting on their repayments. As at end-February 1999, ¥13.3 trillion of guarantees had been provided, prompting expectations that the government would expand the scheme.

In addition, the value of non-convertible corporate bonds outstanding increased by over 26 per cent during 1998, compared with 18 per cent during 1997, while the outstanding stock of commercial paper increased by 50 per cent in 1998, compared with 12 per cent during 1997. Much of the commercial paper has been purchased by The Bank of Japan, which held ¥8.3 billion worth at end-December 1998, an increase of 77 per cent on a year earlier. The Bank of Japan announced last November that it would relax conditions on such purchases by lengthening the maturity limit from three months to one year.

Recent quantitative evidence of a supply constraint on lending growth in 1997 is provided by Woo (1999). Using a sample of 79 banks, accounting for 90 per cent of banking assets in 1997, he found that falling bank capital ratios (on three different measures)[10] depressed credit growth markedly in 1997, even after allowing for the influence of lower demand. In contrast, for earlier years in the decade, he found evidence of a statistically significant negative relationship between changes in capital ratios and bank lending growth. He interpreted the former as the impact of a capital crunch since 1997, and the latter as the effect of "moral hazard" in earlier years which weakened financial discipline and resulted in banks with the lowest capital taking the biggest risks and increasing their lending the most.

In summary, weak credit demand has probably been the main reason for the slow growth in credit in recent years but banks' credit supply criteria do appear to have tightened since the beginning of 1998.

H2 vs H3

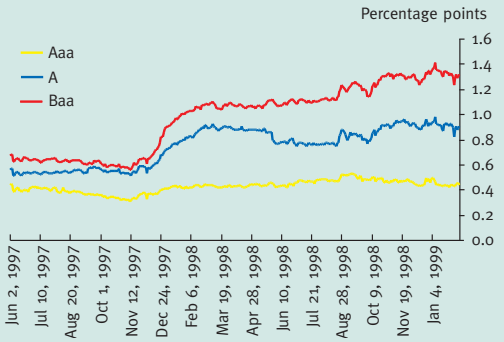
Since the beginning of last year, there has been a reduction in credit growth across all types of bank. The level of total outstanding loans fell by 4.7 per cent during 1998 (or by 1.6 per cent after allowing for write-offs and securitisations) and by a further 0.3 per cent in the first quarter of 1999. Even if some corporates want to borrow and spend more at current lending rates, that may be because banks are concerned about credit quality (H3), rather than because they are balance-sheet constrained (H2). The different weight attached to each hypothesis is important. Assuming capital strength does not affect their appetite for risk, recapitalisation will boost lending if banks have been balance-sheet constrained but not if they have chosen to reduce lending.

Separating the two hypotheses is not straightforward. It is especially difficult in the case of Japan because the recent measures designed to impose rigorous capital standards —

which might be regarded as an argument in favour of H2 — could have had the effect of making banks' management conclude that the government would pursue a tougher policy, including opposition to bail-outs. If so, that may have prompted banks to base their lending policies on criteria which take more account of risk (H3). Hence, they may have cut back lending because of a lack of lending opportunities with an attractive balance of risk and expected return. If banks had become more risk averse about lending, one would expect the supply of loans to be cut back most for the least creditworthy borrowers rather than equally across all classes of borrowers. Although information on the credit-worthiness of different bank borrowers is not readily available to test this hypothesis, spreads over government-bond yields of Japanese corporate bonds have increased more sharply for lower-rated companies since end-1997 than for higher-rated ones (see Chart 2), providing some support for it. But that may reflect either an increase in risk aversion on the part of lenders in capital markets (with the perceived credit worthiness of individual companies unchanged) or a perceived divergence in the credit worthiness of borrowers, or an element of both.

There is also evidence to suggest that some banks are currently capital or deposit-constrained (H2). If the reduction in lending reflected concerns about credit quality, it would have been spread across the whole banking sector, assuming that the composition of loan portfolios is broadly similar. In fact, the fall in credit growth has not been uniform. It has not been seen at the regional banks. They may have been less capital constrained, because most of them do not operate in international markets and so are

Chart 2 Yield spreads of corporate bonds over government bonds



Source: Bank of Japan (Monthly Report of Economic Developments — February 1999), Securities Dealers Association of Japan, "Over-the-Counter Standard Bond Quotations". The indicated ratings are from Moody's.

subject to a 4 per cent capital-adequacy ratio rather than the 8 per cent BIS capital-adequacy ratio. Moreover, most regional banks — those operating only in the domestic market — were not subject to prompt-corrective-action measures or the new loan-loss provision standards until recently[11].

On the other hand, the Japanese international banks have cut back domestic lending sharply and have also reduced their lending growth across all emerging market economies. Japanese-owned banks' lending to non-BIS reporting countries fell by 27 per cent in 1998 compared to a more modest fall of 2.5 per cent during 1997. Moreover, total external lending by banks operating in Japan grew by only 2.5 per cent in 1998, having increased by 8 per cent during 1997. Thus there seems to be a marked quantitative

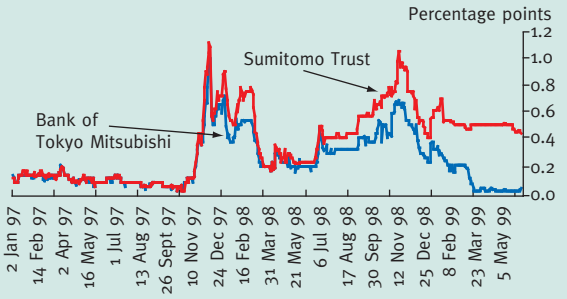
Table 4 Annual (per cent) growth in demand, time and savings deposits at total domestic banks

	Total	Individuals	Non-individuals
Memo: percentage share of total deposits at end-1998 (in brackets)	(100)	(60)	(40)
1997Q3	Nil	5.6	-6.7
1997Q4	2.2	6.0	-2.1
1998Q1	Nil	6.3	-6.3
1998Q2	Nil	11.6	-8.0
1998Q3	0.1	5.5	-4.9
1998Q4	Nil	4.6	-4.9

Source: Tables 13 and 60, Bank of Japan *Economic Statistics Monthly* (various issues).

difference in banks' behaviour according to how regulatory capital requirements have bitten. But hypothesis H3 is also relevant to the extent that the regional banks have been (until recently) subject to less pressure from the regulators, and so may have changed their lending practices less.

Chart 3 Japanese banks' foreign currency borrowing spreads



Source: Reuters. Japanese banks' US dollar borrowing rate over LIBOR (the 'Japan Premium').

There is also some evidence that reductions in the banks' deposit base may have constrained their lending. Although there has not been a generalised run on the banking system in the classic sense (that is, a panic scramble for cash) by households over the past year[12], there have been net withdrawals by wholesale-deposit holders. The growth in individuals' demand, time, and savings deposits has slowed slightly but remains positive (about 6 per cent per annum in December 1998), broadly in line with the growth in savings in postal banks. Individuals' deposits are a particularly important source of funding for the regional banks, accounting for around 70 per cent of their demand, time and saving deposits. Their lending has been broadly flat rather than falling over the past year. But other types of bank are much less reliant on retail funding. As at the end of the last financial year, individuals' deposits accounted for only half of non-regional banks' deposits. Such banks may have been constrained by insufficient non-individual (wholesale) deposits (see Table 4). Bank deposits placed by other domestic financial institutions fell by 31 per cent during 1998, while foreign-currency and non-resident yen deposits – measures of foreign residents' deposits — fell by 30 per cent and 32 per cent respectively over the same period. This suggests a drawn-out form of 'wholesale run' on Japanese banks, and is reflected in the higher borrowing costs that Japanese banks had to pay for foreign-currency loans on the interbank market — the so-called Japan premium (see Chart 3). That premium appears to have narrowed since the recapitalisation was announced, although it is difficult to know how that should be interpreted because few Japanese banks are currently active borrowers in the foreign-currency inter-bank market. Withdrawals by wholesale depositors may have impaired the ability of banks to lend irrespective of any change in perceptions about whether the government was willing to bail out banks.

Anecdotal evidence suggests that some Japanese banks have reduced lending to intermediate credit-risk borrowers rather than the worst credit-risk borrowers. They are apparently continuing lending to the latter in the hope of keeping them afloat, thereby protecting loans already made. Overall, the purpose would seem to be to avoid having to recognise loan losses to these firms, which would tend to impair banks' accounting capital ratios.

Conclusion

Survey data and the rapid increase in financing from outside the private banking sector suggest that since the beginning of 1998 Japanese companies may have wanted to borrow more than banks have been willing to or able to lend. Since banks' lending spreads (over short-term market rates) had fallen rather than increased until this March, credit appears to have been rationed through quantity (or a tightening in non-price terms) rather than price.

A decline in credit supply may be partly attributable to a downgrade of borrowers' credit worthiness or, for given customer quality, an increase in risk aversion because of the banks' perception that government will no longer bail them out. Data distinguishing the creditworthiness of different bank borrowers would be useful to explore this hypothesis. But it seems possible that credit supply declined in part because some banks cannot lend, because of capital and/or deposit constraints. The evidence for this is that credit growth is weakest at banks which rely most on (declining) wholesale deposits and where official capital-ratio requirements are said to be binding. If so, that would suggest that recapitalisation over and above that required to offset bad loans is a necessary measure to give a direct boost to lending, and so possibly to investment. It may not be sufficient, if banks feel constrained from lending because of concerns about credit quality (H3). Moreover, the main drag on the Japanese economy continues to be the lack of desire to spend by the household sector and parts of the corporate sector, which will not be affected directly by bank recapitalisation. Nevertheless, if recapitalisation increases confidence in the Japanese economy generally, it may have some positive indirect effect in reducing household and corporate propensity to save.

A chronology of recent events affecting the Japanese banking sector

3 November 1997	Sanyo Securities filed for corporate reorganisation and defaulted in the inter-bank markets — the first time that had happened in Japan.
7 November 1997	Nikkei 225 fell below 16,000.
17 November 1997	Failure of Hokkaido Takushoku Bank (Takugin) announced.
22 November 1997	Nikkei 225 fell below 15,000.
23 November 1997	Yamaichi Securities confirmed it was to shut down its business.
December 1997	The Ministry of Finance allowed banks to value securities using the cost accounting method instead of the more conservative "lower-of-cost-or-market (LOCOM)". This allowed banks not to recognise substantial stock market losses.
31 March 1998	¥1.8 trillion injected into the banking sector in the form of subordinated loans and preference shares issued by banks and bought by government. Each of the major banks took around ¥100 billion.
1 April 1998	The Ministry of Finance introduced 'Prompt Corrective Action,' which obliged "internationally active" banks to value their assets on a prudent and realistic basis. This enabled the authorities to gauge the proportion of non-performing loans across the sector.
22 June 1998	The new Japanese Financial Supervisory Agency (JFSA) assumed responsibility for regulation of the financial system from the Ministry of Finance.
28 August 1998	Nikkei 225 fell below 14,000.
9 October 1998	Nikkei 225 reached trough of 12,879.
12 October 1998	Government passed the *Financial Revitalisation Law*, the *Financial Early Strengthening Law* and the amendment to the *Deposit Insurance Law*. Together, they provided ¥60 trillion to restore Japanese banks to financial health: ¥25 trillion to recapitalise weak but solvent banks; ¥18 trillion to nationalise or liquidate failed banks and ¥17 trillion for depositor protection. The law also provided for the formation of a *Financial Revitalisation Committee* to oversee the restructuring process.
23 October 1998	Long Term Credit Bank placed under special public administration. It was the 10th largest of the major Japanese banks.
13 December 1998	Nippon Credit Bank placed under special public administration.
25 December 1998	JFSA announced that the level of total bad and doubtful debts held by Japanese banks at end-March 1998 (the first figures audited by the JFSA) was ¥49.5 trillion (10 per cent of GDP).
January 1999	JFSA introduced minimum standards for loan-loss provision at "internationally active" banks — these are 15 per cent coverage for loans in danger of turning bad, 70 per cent for loans that are three months in arrears, and 100 per cent for loans that are 'uncollectable'.
12 March 1999	Japanese banks requested ¥7.5 trillion in public funds to recapitalise and restructure their balance sheets. The funds come in the form of preference shares and subordinated loans.
30 March 1999	Funds were injected into banks.
21-25 May 1999	Japanese banks reported a 23 per cent fall in aggregate operating profits to ¥2.5 trillion in the year to 31 March 1999. Despite a ¥10 trillion provision for bad and doubtful debts, the government capital injection meant that risk-asset ratios increased for all banks, with the average rising to 11.8 per cent.

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Notes

1 We would like to thank John Dorrington, Gerard Lyons, and Geoffrey Wood for helpful comments, although the views expressed are our own.

2 On the latter argument, see Krugman (1998a and 1998b). Note that the possibility of an increase in risk aversion due to a lower expectation of bail-out would reduce lending to the Japanese private sector by Japanese-owned banks but not by foreign-owned banks.

3 Under the Basel Accord, banks' capital can be split into three "tiers": shareholders' equity and disclosed reserves are known as tier I; undisclosed reserves, asset-revaluation reserves, general provisions or loan-loss reserves, hybrid debt, equity capital instruments and subordinated debt are known as tier II; and short-term subordinated debt comprises tier III.

4 The major banks consist of city banks, long-term-credit banks (of which there is now only one remaining under private ownership after Long Term Credit Bank and Nippon Credit Bank were put under special government administration), and trust banks. One of the regional banks — Yokohama Bank — has also applied for loans. At the time of writing, Bank of Tokyo Mitsubishi is the only major bank not to have applied for funds.

5 In terms of credit seniority, subordinated debt ranks below regular deposits but above preferred shares. Equity capital ranks below all three of them.

6 For example, the minimum time period before which the government can convert preference shares into common shares, and therefore acquire voting rights, varies between three months and seven years.

7 RARs excluding recapitalisation were calculated by subtracting the ¥7.5 trillion government capital injection from current capital bases of banks, which reduces the numerator of the risk-asset ratio.

8 Nomura Research Institute Consumers' sentiment index is at an historical low, although Economic Planning Agency data for 1999 Q1 show a 3.3 percentage points improvement in consumer confidence over the previous quarter to 40.3 points.

9 The Bank of Japan targets the overnight (uncollateralised) call rate in its monetary policy.

10 These three measures were the conventional BIS capital ratios, the BIS capital ratios adjusted for capital gains in assets and capital ratios based on the market capitalisation of bank capital.

11 The Japanese FSA began inspecting the regional banks in October 1998, although selected results have only recently been made public.

12 However, the failure of the Kokumin Bank in April 1999, a second-tier regional bank from the Tokyo area, took place following a large withdrawal of deposits by households. More generally, anecdotal evidence suggests that there has been a flight to quality by retail depositors from weak banks to stronger ones but this switch does not affect the aggregate data of the main banking groups.

Credit risk modelling

Patricia Jackson, Pamela Nickell and William Perraudin, Regulatory Policy Division, Bank of England

LAST AUTUMN the Bank of England and the Financial Services Authority (FSA) hosted a conference to examine developments in credit risk modelling and their regulatory implications. The conference was co-organised by the Federal Reserve Board of Governors, the Federal Reserve Bank of New York and the Bank of Japan, and was attended by central bankers, regulators, academics and senior practitioners working in the field.

The main goal of the conference was to look at evidence on the construction and reliability of credit risk models. This issue has financial stability implications in terms of both the reliance that firms can place on models to improve their credit risk management and the reliance that regulators can place on them to calculate capital requirements for credit risk, which form the main prudential buffer in banks' balance sheets. The Basel Committee on Banking Supervision was actively considering whether models were sufficiently well developed to be used as a regulatory tool in any revision to the credit risk treatment set out in the 1988 Basel Accord.

The 1988 Accord established a common minimum standard for the capital requirements for internationally active banks in the G10, the central element of which were credit risk requirements. In 1996, the Accord was amended to include new risk-based requirements for securities and fx trading books. As part of this risk-based approach, sophisticated firms were given the option of requesting recognition of their in-house value-at-risk (VaR) models to set the capital requirements for their trading books. These VaR models assessed likely losses taking into account the volatility and correlations of the returns on different assets.

Banks are now developing models to enable the calculation of value-at-risk on portfolios of credit exposures. Like market VaR models, these take into account the correlations between returns on different exposures. Banks are starting to use them to allocate economic capital and as a risk management tool. **William McDonough** (Chairman of the Basel Committee on Banking Supervision and President of the Federal Reserve Bank of New York) said in a keynote address to the conference that the development of credit risk modelling would be the catalyst for a major rethinking of the theory and practice of credit risk management over the next few years. Other speakers also applauded their potential use as a risk management tool.

Banks have been pressing for the recognition of models in setting capital for credit books, because of distortions created by the current requirements. The conference started by considering the extent to which strains had developed in applying the current standard and then looked at developments in credit risk modelling. The key issue on which the conference attempted to shed light was the accuracy of the models. Credit risk modelling is at an earlier stage of development than modelling of trading book VaRs and the data problems are more acute, making an assessment of reliability essential. The conference also looked at ways in which the models could be tested and how they might evolve in the future.

Strains in the current system

The 1988 Basel Accord placed exposures in broad risk categories to which capital weights were applied: essentially 0 per cent for OECD government exposures, 20 per cent for interbank, 50 per cent for residential mortgages, and 100 per cent for the remainder (including the full range of

corporate exposures). The broad bands, encompassing a wide range of risks, provide incentives for banks to carry out regulatory arbitrage — reducing the regulatory measure of their risk with little or no reduction in their economic risk.

David Jones (Federal Reserve Board) showed how securitisation and other financial innovations had enabled banks to engage in such arbitrage. This had created the danger that reported regulatory capital ratios could mask a deterioration in a bank's true financial condition.

Claes Norgren (Director General, Financial Services Authority, Sweden) discussed more generally the pressures on the current treatment of credit risk. The Accord did not acknowledge risk diversification and gave only limited allowance for risk reduction through collateral, guarantees or netting. Nor did it take account of new instruments or techniques such as credit derivatives.

John Mingo (Federal Reserve Board) looked at the policy implications of regulatory arbitrage. He suggested that it was tempting for regulators to respond by formally forbidding the procedures used by banks to reduce their effective capital requirements. But this would be ill advised, in part because financial innovation would enable banks to find alternative avenues. Perhaps more important, regulatory arbitrage provided a safety valve, mitigating the effects of capital requirements that substantially exceeded an economic assessment of risk. He set out the goals for prudential regulation and supervision and looked at how the Basel Accord could be brought into line with the banks' own assessment of risk. There were two proposals on the table — modification of the Basel risk bucket approach or a full models approach. In his view it was not necessary for Basel to adopt a full models approach — although in theory that would be preferable — but any new risk bucketing system would have to bear some resemblance to banks' own internal rating systems.

Michael Foot (Managing Director, Financial Services Authority, UK), expressed a strong preference for supervisory tools based on methods used by the regulated firms themselves. He hoped that in time it would be possible for supervisors to accommodate credit risk modelling within their own regulatory procedures. But at present the dangers, as well as the rewards, of credit risk models were much greater than those of market risk models. He identified issues that needed to be addressed. These included the scarcity of data, particularly covering more than one business cycle; the scale and sophistication of the banks that would be able to run these models; and the need for more work to be done on operational risk and on the correlations between market, credit and operational risk. He announced that, when UK banks could demonstrate that their credit risk modelling contributed to sound risk management practice, the FSA would take this into account in setting individual risk asset capital ratios for those banks.

Current credit risk modelling and internal grading practice

A survey by the FSA into the use of credit risk modelling techniques in the UK found that major banks, like their continental counterparts, had been working to incorporate within their credit risk management processes models that have been published or sold by third parties. The survey, described in a paper by **Vyvian Bronk** and **Emmanuelle Sebton** (Financial Services Authority, UK), noted that credit

... They noted that as the rating process almost always involved the exercise of human judgement, banks needed to pay careful attention to the internal incentives that could distort rating assignment ...

portfolio modelling was typically confined to certain parts of the asset portfolio. Different techniques were applied to different types of business. For example, "bottom-up" approaches were generally applied to individual large corporate exposures (where information on each corporate was readily available). "Top-down" models tended to be applied to retail credit portfolios, grouping together exposures where there was little information on individual obligors. Models were commonly used to allocate economic capital within business units and as an input to more consistent pricing of certain credit risks. However, the use of models to create an integrated approach to overall credit risk management was rare.

One important issue discussed in the FSA's survey related to the choice of modelling horizon. Longer horizons implied correspondingly larger possible losses. The horizon most commonly chosen was one year — because data on changes in credit quality (default rates and credit rating transition probabilities) were most commonly available at this horizon. This horizon might be suitable for some purposes, but could be too short for others. An important consideration when deciding upon the modelling horizon was whether the portfolio model aimed to capture only the probability of loss due to default (ie a "default mode" model) or whether it was designed also to capture changes in economic value during the planning horizon (a "mark-to-market" model).

The Federal Reserve System has recently published a comparable study which reviews credit risk modelling practice in the US *(Credit Risk Models at Major US Banking Institutions: Current State of the Art and Implications for Assessments of Capital Adequacy, 1998)*. **John Mingo** stated that for several of the major US banks surveyed, credit risks were measured in a crude fashion or not at all for some business activities (eg consumer or small business credit products). In business areas where credit risk measurement was more sophisticated (eg in the trading book and for large and middle market corporate lending) the Federal Reserve study noted significant shortcomings both in model construction features and model validation procedures. These included a lack of stress testing or backtesting.

Bill Treacy and **Mark Carey** (Federal Reserve Board) presented the results of their survey of internal rating systems at large US banks. They noted that as the rating process almost always involved the exercise of human judgement, banks needed to pay careful attention to the internal incentives that could distort rating assignment. Also, rating criteria might be largely a matter of "credit culture" rather than formal written policy, and data might not have been kept in a form that allowed the analysis of the relationship between assigned grades and actual loss experience. While a few US banks were moving towards models as the primary basis for internal ratings, most still believed that properly managed judgemental rating systems delivered more accurate assessments of risk.

Jeremy Gluck (Moody's, New York) described the rating process used by Moody's for collateralised debt obligations (CDOs) — a rapidly-growing class of debt instruments which consisted of securitised pools of bonds or loans. Moody's had attempted to replicate the loss behaviour of the securitised pool of assets by postulating a smaller pool of assets (for each of which Moody's had produced a rating, which could be related to an historical estimate of default probability). For this pool, the loss distribution had the same mean and volatility as the CDO, so that, by simulating various loss scenarios, the expected loss (and hence rating) for each tranche of the CDO could be estimated.

Credit risk models and inputs

A number of the papers at the conference examined the design of credit risk models and problems with the inputs used. Credit risk models must take account of shortcomings in the data, notably the lack of mark-to-market price data

on loan books. The different models (see Box 1 for a description of the main model types) tackle this by devising proxies for market prices using other information about the obligor. For example, some employ bond ratings or a bank's own internal counterparty ratings, while others use the equity market capitalisation of obligors.

All credit risk models inevitably depend heavily on the quality of data inputs. For example, it is essential for ratings-based models that ratings are accurate and consistent indications of credit standing. While a rating itself provides information on the current credit standing of an obligor, rating migration patterns indicate how credit standings may change over the modelling horizon.

Gordon Delianedis and **Robert Geske** (UCLA) examined the relationship between default probabilities and credit rating transitions (including default), and demonstrated that rating downgrades may lag behind the deterioration in credit quality. While this characteristic of rating changes was well known, the magnitude of these lags (up to 18 months in some cases) suggested a serious limitation on the usefulness of ratings.

In another study of the reliability of ratings for credit risk purposes, **Pamela Nickell**, **William Perraudin** and **Simone Varotto** (I)(Bank of England) argued that the use of a single rating transition matrix in credit risk models might not be appropriate. A multivariate model, distinguishing obligors by domicile and industrial sectors, and taking account of the business cycle, might provide a more valid summary of migration patterns than the common practice of using simple estimates of transition probabilities based on historical averages. They also questioned whether the use of rating transition models estimated from data on changes in bond ratings was appropriate in credit risk models applied to loan portfolios. Until recently, empirical corporate default rate studies had considered only bonds (whose prices were readily observable), rather than loans. **Edward Altman** and **Heather Suggitt** (Stern School, NYU and Credit Suisse First Boston) presented the first study of default rates and rating changes in the corporate loan market. They found that default behaviour of loans quite closely resembled that of bonds five years after issuance, but was somewhat different for one to three years after issuance. However, these results covered the recent relatively benign credit period in the US (1992-1997).

Evaluating credit risk models

The main issue for regulators contemplating the use of credit risk models to calculate capital requirements is whether they can produce accurate results. In fact, validation is extremely difficult, largely because all credit risk models suffer from lack of data. This hampers both the construction of models and the ability to carry out backtesting. One problem with credit risk is that the loss distribution is heavily skewed. A long time series of data (covering many business cycles) would be necessary to identify the shape of the tail of the distribution. In the absence of these long runs of data, many models assume that the distribution is normal. This simplifying assumption would be likely to create biases in the value-at-risk estimates.

A large number of observations are needed from any model in order to judge whether it is accurate. Since the relevant holding period for credit risk modelling is long (a year is probably the minimum), it is extremely difficult to construct data sets with many observations. In backtesting credit risk models, judging accuracy is made more difficult by the absence of a market price for a loan portfolio, and therefore the absence of a ready measure of the change in the value of the portfolio against which the model's calculated value-at-risk can be compared. A further difficulty is that the proxies for market value employed by the models are not available for many obligors. Many companies do not have an equity market quotation (either because the equity is tightly held and not marketed or because they are privately owned) and most small and medium-sized firms are not rated. Indeed, outside the US even large firms are often not rated.

The conference included presentations of some of the first serious attempts to evaluate model results.

A paper by **Michel Crouhy** and **Robert Mark** (Canadian Imperial Bank of Commerce, Canada) and another by **Michael Gordy** (Federal Reserve Board) compared the values-at-risk and thus capital levels implied by different models at a point in time. Crouhy and Mark applied several models (CreditMetrics, KMV, CreditRisk$^+$ and CIBC's own CreditVar1) to a large diversified benchmark bond portfolio. Their results suggested that (when parametrised in a similar manner) models of apparently different types could yield broadly consistent values-at-risk, although some did differ by as much as 50 per cent. Michael Gordy compared the values-at-risk implied by CreditMetrics and CreditRisk$^+$ using simulated portfolios designed to resemble banks' actual holdings. He found that CreditRisk$^+$ and a restricted version of the CreditMetrics model yielded similar results, although the former was more responsive to the credit quality of the portfolio. He did, however, find that the output of his CreditRisk$^+$ model could be highly

Box 1 Credit risk models

Credit risk models attempt to estimate, for a portfolio of credit exposures, the loss over a particular time horizon which will be exceeded on not more than, say, 0.5 per cent of occasions — in other words, the value-at-risk estimated with 99.5 per cent confidence. Models are designed to estimate the loss either arising from default (default-mode models) or as a result of the change in economic value of the loans because of credit deterioration (mark-to-market models). A number of credit risk models have been developed over the past decade. These include both proprietary applications intended for internal use by financial institutions, and others intended for sale or distribution to third parties. Among the better known publicly available models, there are four main types:

- Merton-based, eg KMV's PortfolioManager
- Ratings-based, eg The RiskMetrics Group's CreditMetrics
- Macroeconomic, eg McKinsey's CreditPortfolioView
- Actuarial, eg CSFP's CreditRisk$^+$

Merton-based models

These are based on the model of a firm's capital structure first proposed by Merton in 1974: a firm is considered to be in default when the value of its assets falls below that of its liabilities. The magnitude of the difference between the assets and liabilities and the volatility of the assets then determine the borrower's default probability. KMV has developed an extensive database to assess the loss distribution related to both default and credit quality migration. KMV's Credit Monitor calculates an expected default frequency (EDF) for each individual borrower as a function of the firm's capital structure, the volatility of its asset returns and its current asset value, using Merton's contingent claim model. KMV's historical data are then used to derive loss estimates.

Ratings-based models

CreditMetrics assumes that changes in a latent variable which drives credit quality are normally distributed. The probability of a borrower's change in credit quality (including default) within a given time horizon can be expressed as the probability of a standard normal variable falling between various critical values. These critical values are calculated using the borrower's current credit rating and historical data on credit rating migrations. They are generally presented in the form of a matrix of probabilities that a borrower with one rating might move into another rating category during a year. For example, for an A-rated credit one row of the matrix shows the probabilities that its rating will change to AAA, AA, BBB, BB, or C, or that the obligor will default; the closer the rating category to the current rating, the higher the probability of a move to that category. Both Merton-based and ratings-based models convert the estimates of losses on individual credits to estimates of loss on whole portfolios by estimating the correlations in changes in credit quality for all pairs of obligors. Both CreditMetrics and KMV's PortfolioManager make the simplifying assumption that a firm's asset returns are generated by a set of common, or systematic, risk factors along with idiosyncratic factors. The idiosyncratic factors may be firm specific, country specific or industry specific.

Macroeconomic models

The most widely used of these, CreditPortfolioView, measures only default risk, and attempts to take into account the link between default probabilities in any period and the macroeconomic climate. It uses Monte Carlo simulation to estimate the joint distribution of default probabilities for individual credits conditional on the value of macroeconomic factors such as the unemployment rate, the growth rate of GDP, the level of long-term interest rates, foreign exchange rates, government expenditure and the aggregate savings rate. Correlations between default rates for different obligors are considered to arise from the covariance structure of the underlying macroeconomic variables.

Actuarial models

Credit Risk$^+$ estimates the loss distribution using statistical techniques developed in the insurance industry. Only default risk is considered. Rather than attempting to relate this to the structure of the firm, the model allocates borrowers amongst "sectors", each of which has a mean default rate and a default rate volatility. Default for individual loans is assumed to follow a Poisson process. Although credit migration risk is not explicitly modelled, CreditRisk$^+$ assumes that the mean default rate is itself stochastic. This assumption generates a skewed distribution of default events, which is taken to account (if only partially) for migration risk.

sensitive to one particular parameter, which describes the tail thickness of the distribution of the systematic risk factor. The main conclusion of both studies was that models might appear very different in mathematical formulation but supply broadly similar risk measures if parametrised in a consistent fashion.

Comparison of value-at-risk calculations produced by different models on the same portfolios at one point in time (as in the studies by Crouhy and Mark, and by Gordy) may help to show whether the outputs of different models are consistent. However, in order to be confident about the relative performance of various models one would need to test the value-at-risk figures produced by the models against the out-turn over a fairly lengthy period — several business cycles at least. The important question is whether the models would in fact generate more exceptions (periods when the value-at-risk was exceeded by actual losses) than they were built to deliver. A model built to deliver a value-at-risk that was exceeded on only one occasion in a hundred might in practice deliver many more exceptions.

Jose Lopez and **Marc Saidenberg** (Federal Reserve Bank of San Francisco and Federal Reserve Bank of New York) discussed a mixture of time series and cross-sectional testing of credit risk models (although they did not actually run these tests on data). They suggested that models should be evaluated not only on their forecasts over time, but also on their forecasts at a given point in time for simulated credit portfolios. They contended that cross-sectional evaluation of models might permit validation in the absence of long data runs.

Pamela Nickell, **William Perraudin** and **Simone Varotto (II)** presented a paper evaluating two of the most widely applied types of credit risk model on an out-of-sample basis. The models tested were a ratings-based framework resembling CreditMetrics and an equity-based model resembling the approach of the consulting firm KMV. They were tested using an extensive data set of Eurobond prices. The assessment of the models was carried out in a rigorously out-of-sample fashion, comparing the model's one-year holding period value-at-risk estimates with out-turns. This test was conducted on a variety of portfolios over an 11-year period.

They concluded that the two approaches implied similar capital requirements for well diversified portfolios, although significant differences emerged when the models were applied to low-credit quality exposures and less well diversified portfolios. An important finding was that the estimate of value-at-risk was too low. The models were built to deliver a 99 per cent confidence level — in other words, one occasion in a hundred when losses exceeded the value-at-risk estimate. When run on portfolios of US corporate exposures, the losses exceeded the value-at-risk estimate in one year out of the eleven. But when run on portfolios of exposures to non-US borrowers the figure was five times this. There were also a large number of exceptions when the models were used to calculate value-at-risk numbers for portfolios of exposures to financial companies including banks.

A general conclusion that emerges from the few studies of the accuracy of credit risk models so far conducted is that they are not robust to slight changes in the parameters (as demonstrated in particular by Michael Gordy). For each model, several of the more important parameters are hard to pin down convincingly using the data available. This last point had become obvious to Nickell, Perraudin and Varotto in their construction of two models. Each required various assumptions to be made about parameter values. In addition this paper raised questions about whether the value-at-risk figures produced by the models were sufficiently conservative.

Testing methods used in the various papers presented at the conference

Comparison of the anatomy of the models	Gordy Crouhy and Mark
Comparative simulation exercises	Gordy
Comparison of estimates from different models for a single portfolio	Crouhy and Mark Gordy
Development of empirical tests	Lopez and Saidenberg
Comparison of forecasts and out-turns over time	Nickell, Perraudin, Varotto

... There are significant hurdles that will have to be overcome before the models could be used to set regulatory capital requirements. In particular, it is not clear that the output of the models is yet sufficiently transparent and susceptible to backtesting ...

Patricia Jackson (Head of Regulatory Policy, Bank of England) summing up the session on testing methods said that in order to consider a regulatory use of models there needed to be a clear understanding of what the various models delivered — how one type of model compared with another; the weaknesses of the various approaches; whether they supplied unbiased measures of value-at-risk; whether some models worked better for some types of exposure than others; and whether the models could accurately rank credit portfolios according to their relative riskiness. All the papers presented at the conference had focused on models based on publicly available data (ratings/equity prices) for large corporate exposures. Even less was known about the accuracy of models built by the banks for other parts of the book using in-house data.

Overall, the results presented at the conference indicated that significant further work will be necessary before the output of these credit risk models can be regarded as robust and reliable measures of risk. Meanwhile, efforts to develop new models that describe the essential credit risk behaviour of corporate loan portfolios continue: the conference provided an opportunity for several approaches to be discussed.

New techniques

Darrell Duffie (Stanford University) reviewed some methods for simulating correlated defaults for loan portfolios, and compared some of the features of their implied distributions. **Robert Jarrow** and **Stuart Turnbull** (Cornell University and CIBC, Canada) presented a model that (unlike CreditMetrics and KMV) incorporated macroeconomic variables that appeared to influence the aggregate rate of business failures. Correlations in default probabilities were assumed to arise from their common dependence on the same economic factors. As an alternative to the conventional value-at-risk method for determining adequate capital, **Daisuke Nakazato** (Industrial Bank of Japan) proposed a version of a Coherent Pricing Method that used a contingent pricing approach and attempted to capture the diversification effect of the credit portfolio.

Conclusions

Both **Howard Davies** (Chairman, Financial Services Authority, UK) and **Oliver Page** (Director, Financial Services Authority, UK) expressed the widely-held view that credit risk models are a useful addition to the armoury of risk management tools. They stressed the need for regulators to find ways of rewarding good credit risk management. Models could represent sensible and illuminating ways of organising assumptions about the risks involved in credit portfolios. They could help both management and regulators to improve their understanding of institutions' risk taking.

However, the conference highlighted the fact that many issues have not yet been resolved, in particular questions of data availability and model validation. There are therefore significant hurdles that will have to be overcome before the models could be used to set regulatory capital requirements. In particular, it is not clear that the output of the models is yet sufficiently transparent and susceptible to backtesting to allow them to be used in this way. This point was stressed in the report published recently by the Basel Committee on Banking Supervision ("Credit risk modelling: current practices and applications", April 1999).

Alastair Clark (Executive Director, Financial Stability, Bank of England), summing up the conference, emphasised that regulatory progress would be highly dependent on industry progress with data collection and testing, and on further academic advances.

CREDIT RISK MODELLING AND THE REGULATORY IMPLICATIONS

CONFERENCE HELD AT THE BARBICAN, LONDON 21-22 SEPTEMBER 1998

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CLOSING REMARKS
Alastair Clark (Bank of England)

The following summaries of the individual papers were prepared or approved by the speakers. The full versions of most of the papers will be published in a special edition of the *Journal of Banking and Finance* covering the conference.

Emerging problems with the accord: regulatory capital arbitrage and related issues

David Jones, Federal Reserve Board, Washington

THE USEFULNESS of the Basel Accord's risk-based capital (RBC) ratios — as a "trigger" for supervisory interventions, and an important basis for financial disclosures that are scrutinised by bank counterparties — depends on the reliability of total risk-weighted assets as their implicit measure of bank risk taking. Yet, even at the Accord's inception, it was clearly understood that total risk-weighted assets were not a reliable measure of risk. For example, within the banking book, all commercial loans receive the same 100 per cent risk-weight, regardless of the ratings of the borrowers. The measure also ignores critical differences in diversification, hedging, and the quality of risk management.

Such shortcomings, together with recent financial innovations, are undermining the effectiveness of regulatory capital policies by encouraging widespread regulatory capital arbitrage and discouraging effective risk management practices.

Regulatory Capital Arbitrage

Regulatory capital arbitrage is defined as activities that permit a bank to assume greater risk with no increase in its minimum regulatory capital requirement, while at the same time showing no change, or possibly an increase, in its reported capital ratios. Such activities reflect banks' efforts to keep their funding costs, inclusive of equity, as low as possible. In practice, capital arbitrage exploits the large divergences that can arise between a portfolio's true economic risks and the Accord's measure of risk. At present, four major types of capital arbitrage appear to predominate:

1 *Cherry-picking* This is the oldest form of capital arbitrage. Within a particular risk-weight category, cherry-picking is the practice of shifting the portfolio's composition toward lower quality credits, so that the bank's total risk-weighted assets and regulatory capital ratios would appear unchanged, even though its overall riskiness increases.

2 *Securitisation with partial recourse* Securitisation involves the sale of assets to a "special purpose vehicle" (SPV), which finances this purchase through issuance of asset-backed securities (ABSs) to private investors. Often, a bank can treat securitised assets as "true sales" for accounting and regulatory purposes, even though it retains most of the underlying risks through credit enhancements it provides to the ABSs. Under the Accord, when securitised assets have been previously "owned" by a bank, its credit enhancement is treated as "recourse", which normally incurs an effective 100 per cent RBC requirement. This treatment implies that as long as the assets are of sufficiently high quality that the amount of recourse is less than 8 per cent of the securitised pool (termed "partial recourse"), the bank's tier 1 and total RBC ratios will increase, regardless of whether any significant risk has been shifted to the ABSs. In substance, most securitisations with partial recourse amount to sophisticated cherry-picking.

3 *Remote origination* Many banks structure their securitisation programs so that partial credit enhancements are treated as "direct credit substitutes", which incur only an 8 per cent RBC requirement, rather than a complete write-off as with recourse. The SPV, rather than the bank itself, originates the securitised assets — a process termed "remote origination". Even though the bank is exposed to much the same risk as in a traditional securitisation, since the bank never formally *owns* the underlying assets, the credit enhancement is treated as a direct credit substitute.

4 *Indirect credit enhancements* Under the Accord, it is possible to provide the economic equivalent of a credit enhancement in ways that are *not* recognised as instruments subject to any formal capital requirement. Investors are often willing to accept "indirect credit enhancements", such as early amortisation and fast-payout provisions, in lieu of traditional financial guarantees. Their use reduces even further a bank's RBC charges against securitised assets, in some cases to *zero*.

Erosion of effective capital standards

With the proliferation of capital arbitrage techniques, the largest banks now routinely achieve *effective* RBC requirements against certain portfolios that are well below the Accord's *nominal 8 per cent* standard, thus eroding *effective* capital standards.

Under the current Accord, capital arbitrage poses difficult policy tradeoffs. Capital arbitrage fundamentally is driven

by large divergences that arise between economic risks and the Accord's total risk-weighted assets measure. Without addressing these fundamental factors, supervisors may have little practical scope for limiting capital arbitrage other than by, in effect, imposing broad restrictions on banks' use of financial engineering technologies.

Such actions, however, would be counterproductive and perhaps untenable. Capital arbitrage often functions as a safety-valve for mitigating the adverse effects of *nominal* capital requirements that, for certain activities, are unreasonably high. By reducing *effective* capital requirements against such activities, capital arbitrage permits banks to compete in relatively safe businesses they would otherwise be forced to abandon, owing to insufficient returns on the regulatory capital needed to support the business. Moreover, as evidenced through their widespread use by non-banks, securitisation, credit derivatives, and other risk unbundling techniques appear to provide significant economic benefits quite apart from their role in capital arbitrage.

Related concern: distorted risk management incentives

The anomalies in the Accord which give rise to capital arbitrage also distort bank risk management practices by discouraging the effective hedging of credit risks. In general, outside the trading account, the Accord provides little or no regulatory capital benefit for (a) increased diversification, (b) improved risk mitigation techniques, such as the use of non-bank collateral and financial guarantees, (c) the shedding of *significant* (albeit partial) credit risk via securitisation and credit derivatives, or (d) the cross-hedging of banking book, trading account, and counterparty credit risk positions. Because such risk reducing actions are costly, they are less likely to be adopted by banks in the absence of regulatory capital benefits. From an overall safety and soundness perspective these risk management distortions may be every bit as important as the problem of regulatory capital arbitrage.

Policy implications of the Federal Reserve study of credit risk models at major US banking institutions

John Mingo, Federal Reserve Board, Washington

THE PAPER concludes that the current Basel Accord is a lose/lose proposition. On the one hand, regulators cannot conclude that a bank with a nominally high regulatory capital ratio has a correspondingly low probability of insolvency. This is because of the "one size fits all" nature of the Accord, in which exceedingly low-risk positions receive the same capital charge as exceedingly high-risk ones. In addition, "regulatory capital arbitrage" (such as through the use of securitisation or credit derivatives) is routinely conducted by the large banks to effectively reduce or eliminate the formal regulatory capital charge on certain types of risk positions.

On the other hand, because the Accord in many cases levies a capital charge out of all proportion to the true economic risk of a position, large banks *must* engage in regulatory arbitrage (or exit their low risk business lines). Since such arbitrage is costly, the capital regulations keep banks from maximising the value of the financial firm.

Three questions need to be answered by regulators in order to craft a rational replacement for the Accord.

1 What are the goals of prudential regulation and supervision?

2 How should "soundness" be defined and how should it be quantified?

3 At what level should a minimum "soundness" standard be set in order to meet the (perhaps conflicting) goals of prudential regulation and supervision?

The paper attempts possible answers to these three questions, then lays out, in broad architecture, the two leading proposals for permitting regulators to verify that banks are indeed meeting a minimum "soundness" standard — a "modified-Basel" (or ratings-based) approach and a "full-models" approach to a revised Accord.

The paper argues that only by using the same analytical framework for regulatory capital requirements as large banks themselves use for calculating internal "economic capital" will both the goals of the regulator and the goals of the shareholder be realised.

Credit risk modelling by banks: a UK perspective

Vyvian Bronk and Emmanuelle Sebton, Financial Services Authority

THE FINANCIAL Services Authority (FSA) has conducted a survey into the use of credit risk modelling techniques by banks in the UK

UK banks' practice

Major banks in the UK, like their continental counterparts, have been working principally to incorporate published/vended models within their credit risk management processes. Amongst the banks surveyed, credit portfolio modelling is typically confined at this stage to parts of the asset portfolio only (such as exposures to large corporates). Different modelling techniques are applied to different types of business (for example, "bottom-up" modelling approaches for large corporates and broader "top-down" models for retail credit portfolios).

Counterparty risk in the trading book is only sparsely covered by models, with coverage typically limited to swaps rather than more complex derivatives.

It is common for model output to be used to allocate economic capital within business units and as an input to more consistent pricing of certain credit risks. However, an integrated approach to credit risk overall is not common, and few banks in the UK use portfolio models for the purpose of actively managing their credit risk portfolio as a whole. Nevertheless, some large banks have re-structured to create a centralised risk management unit responsible for managing a subset of the bank's credit risks actively, and these banks expect re-structuring to have a major impact on their strategic approach to credit risk over time.

Regulatory implications of the development of credit risk modelling

An appropriate supervisory "burden of proof" for credit risk models depends on the regulatory perspective: if the aim is to incorporate credit risk model output into an internationally comparable minimum standard for capital adequacy, then many questions remain to be resolved. However, subject to reassurances on certain technical and implementation issues, Financial Services Authority supervisors may begin soon to take into account the use of credit risk models in their qualitative assessment and comparison of banks' credit risk management functions.

Important benefits may arise from the use of credit risk models in terms of improved measurement of portfolio credit risk and of the effect of risk mitigating actions. Banks have emphasised that benefits could be gained even at the data gathering stage, through the process of estimating the main inputs to the models (size of banks' exposures, default/transition probabilities, loss incurred in default).

There nevertheless remain a number of fundamental implementation issues which the FSA needs to discuss with banks in considering whether a credit risk portfolio model adds value to their credit risk management.

The scarcity of default data may impact on the quality of a model's output and/or its scope. Assumptions on modelling horizons may have a substantial impact on the size of loss, and the FSA would want to discuss the reason for choosing a given modelling horizon and whether this was consistent with the type of model, the portfolio being modelled and the purposes for which the model output was being used in decision-making.

Finally, the bank would need to demonstrate that the model had been tested. Among other things, the FSA would expect banks to have assessed the sensitivity of model output to the various modelling assumptions made and to perform stress testing regularly.

Next steps

The FSA will be undertaking further work in the following areas, in consultation with practitioners:

- a comparative survey of banks' internal loan grading systems and their relationship with default probabilities

- a review of the regulatory treatment of various methods for offsetting credit risk in the light of information gathered through the process of trading book specific risk model recognition, and

- work towards building a credit portfolio review function within the FSA, designed to inform the qualitative assessment of banks' credit risk management functions in the FSA's risk-based approach to supervision ("RATE") and in setting each bank's individual target and trigger ratio above the Basel minimum.

Internal credit risk scoring systems at large US banks

Mark Carey and Bill Treacy, Federal Reserve Board, Washington

CREDIT RATINGS are becoming increasingly important in credit risk management at large US banks. Banks' internal ratings are somewhat like ratings produced by Moody's, Standard & Poor's, and other public rating agencies in that they summarise the risk of loss due to failure by a given borrower to pay as promised. Like the agencies, banks typically produce ratings only for business and institutional loans and counterparties but not for consumer loans. However, banks' rating systems differ significantly from those of the agencies (and from each other) in architecture and operating design as well as in the uses to which ratings are put.

Most large banks use ratings for several purposes, such as guiding the loan origination process, portfolio monitoring and management reporting, analysis of the adequacy of loan loss reserves or capital, profitability and loan pricing analysis, and formal risk management models. Understanding how rating systems are conceptualised, designed, operated, and used in risk management is thus essential to understanding how banks perform their business lending function and how they choose to control risk exposures.

The specifics of internal rating system architecture and operation differ substantially across banks. The number of grades and the risk associated with each grade vary across institutions, as do decisions about who assigns ratings and about the manner in which rating assignments are reviewed. To a considerable extent, variations across banks are an example of form following function. There does not appear to be one "correct" rating system. Instead, "correctness" depends on how the system is used. In general, in designing rating systems, bank management must weigh numerous considerations, including cost, efficiency of information gathering, consistency of ratings produced, incentives, the nature of the bank's business, and the uses to be made of internal ratings.

As with banks' decisions to extend credit, the rating process almost always involves the exercise of human judgement because the factors considered in assigning a rating and the weight given to each factor can differ significantly across borrowers. Moreover, the operational definition of each grade is largely an element of credit culture that is communicated informally rather than being written in detail. Given the substantial role of judgement, banks must pay careful attention to the internal incentives they create or biased rating assignments may result. Such biases tend to be related to the functions that ratings are asked to perform in the bank's risk management process. For example, at banks that use ratings in computing internal profitability measures, establishing pricing guidelines, or setting loan size limits, some staff members may be tempted to assign ratings that are more favourable than warranted. Rating assignments at banks at which all ratings are assigned by independent credit staff are less subject to bias, but the important role of medium-size and smaller loans in most banks' portfolios often makes rating assignment by relationship managers cost-effective. Review activities, especially those conducted by loan review units, are crucial to limiting biases in rating assignments and to maintaining common understanding and discipline.

Although form generally follows function in assigning ratings to business loans, our impression is that in some cases the two are not closely aligned. For example, because of the rapid pace of change in the risk management practices, large banks' rating systems are increasingly being used for purposes for which they were not designed. When a bank introduces a new function that uses ratings, such as risk-sensitive analysis of business line profitability, the existing ratings and rating system are often used as-is. It may become clear only over time that the new function has imposed new stresses on the rating system and that changes in the system are needed.

Several conditions appear to magnify such stresses. The conceptual meaning of ratings may be somewhat unclear, rating criteria may be largely or wholly maintained as a matter of culture rather than formal written policy, and corporate databases may not support analysis of the relationship between grade assignments and historical loss experience. Such circumstances make ratings more difficult to assign, use, review and audit.

Points of external comparison, such as public rating agency grades or results of statistical models of borrower default probability, can aid internal rating assignment and review. A few banks are moving toward models as the primary basis for internal ratings. Such an operating design largely removes the problems of culture maintenance and

conflicting incentives that make management of judgemental rating systems challenging, but most banks believe that the limitations of statistical models are such that properly managed judgemental rating systems deliver more accurate assessments of risk.

It is likely that both regulators and rating agencies will come to depend more upon banks' internal ratings as time passes. Use of internal ratings by such external entities has the potential to introduce qualitatively different stresses on banks' rating systems in which incentive conflicts are not purely internal but which potentially pit banks' interests against those of the external entities. If this occurs, some degree of external validation of internal rating systems would probably be necessary. In our view, while such validation is probably feasible, careful development of a new body of practice will be required. We expect that such developments would emerge from a dialogue among the interested parties.

This summary is based on a review of approaches taken by the fifty largest US bank holding companies: this review included interviews at institutions which covered the spectrum of size and practice among those fifty banks, but a disproportionate share of which had relatively advanced internal rating systems.

Moody's ratings of collateralised bond and loan obligations

Jeremy Gluck, Moody's, New York

THE MARKET for collateralised debt obligations (CDOs) has grown rapidly over the last three years, both in volume and in the range of transaction type. Since Moody's began rating CDOs a decade ago, we have rated more than 250 of these transactions.

In a typical CDO, a pool of bonds or loans is securitised by selling the assets to a special purpose vehicle (SPV), which finances the purchase by issuing two or more tranches of debt. The junior tranche absorbs the initial defaults within the collateral pool, thus insulating the senior tranche from losses. Excess spread (of the coupon payments received on the collateral over the coupons paid on the liabilities) also provides credit enhancement.

This structure may be adopted for either cash-flow or market-value transactions. In the former case, the analytical focus is on the sufficiency of cash flows generated by the collateral pool to meet the interest and principal payable on the SPV's liabilities. In the market-value context, the focus is instead on the liquidation value of the assets in comparison to the principal and accrued interest due on the liabilities. Since 80-90 per cent of CDOs have been of the cash-flow variety, we devote the bulk of our discussion to these structures.

Recently, a number of bank-sponsored transactions have instead hedged exposures within the loan or derivatives portfolio by issuing "synthetic" notes. In these structures, debt is issued by the SPV and invested in highly creditworthy instruments. At the same time, the SPV enters into a credit swap in which it pays the return on the investment pool in return for cash flows sufficient to pay the interest on the rated debt. Should defaults occur within a reference pool of credits, a portion of the invested funds will be liquidated and paid to the bank, reducing the principal available to the investors. These "synthetic" structures allow banks the flexibility to create assets with

Chart 1: Typical CDO Structure

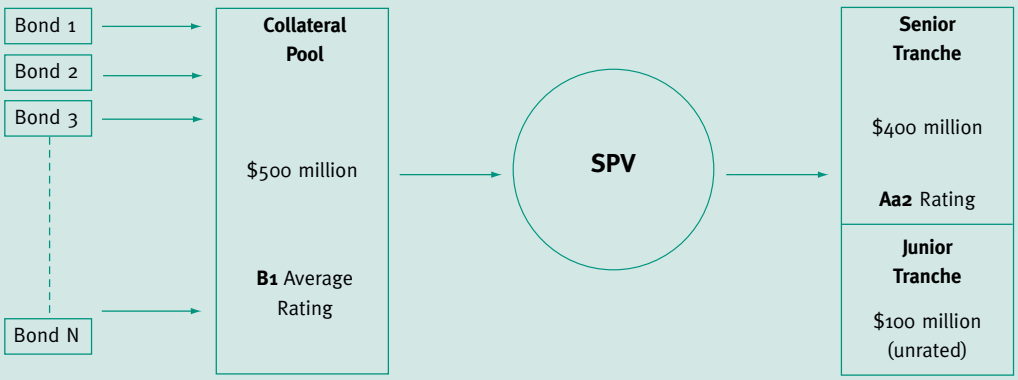
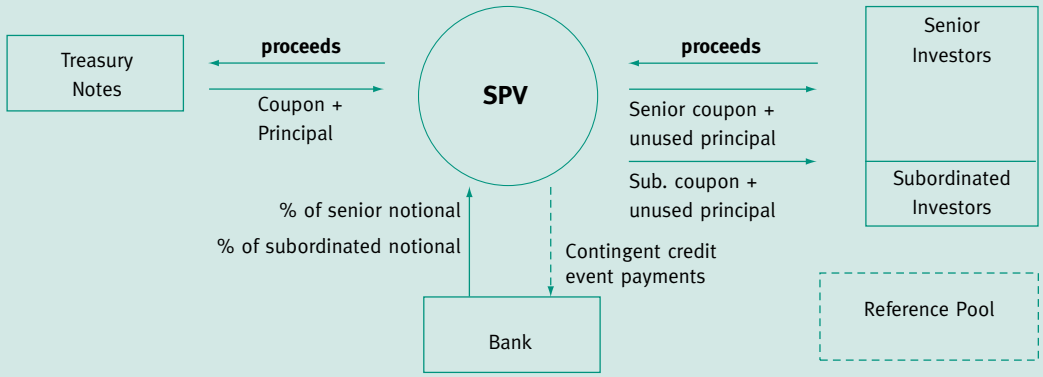


Chart 2: A Potential "Synthetic" CLO Structure



such properties as they require in terms of maturity, coupon etc.

Moody's rates these transactions on the basis of expected loss measured relative to the *promise* made by the issuer. Models of the transactions are used to generate ratings of CDOs that reflect (1) a judgement as to the expected loss for each tranche within the CDO and (2) a comparison of that loss with historical losses on conventional bonds for each rating category.

Moody's generally use an analytical technique — the Binomial Expansion Technique (BET) — to estimate expected losses, rather than Monte Carlo simulation, which is computationally burdensome. BET is less accurate and flexible than simulation methods, but is fast, reliable and easily understood.

The method entails reducing the portfolio to a set of independent bonds with the same loss, or return, distribution as the original portfolio, and considering various loss scenarios. The expected loss is the weighted average of the losses (relative to whatever was promised) across all the scenarios:

Expected loss $= \sum P_s L_s$

where L_s is the loss experienced by the investor under scenario $_s$ (under which s defaults occur) and P_s is the probability that the scenario will occur.

The probability of each scenario is given by the probability of j defaults using a modified binomial formula

$$P_j = \frac{D!}{j!(D-j)!}(\lambda p)^j (1-\lambda p)^{D-j}$$

where p is the probability of default for any one of the identical assets, λ is a stressing factor, and D is a "*diversity score*" — the number of independent, identically sized bonds that mimic the return distribution of the portfolio being modelled. D is intended to reflect the correlations in default rates, the distribution of default probabilities, and the distribution of asset sizes within the actual portfolio.

Current practice is to calculate the diversity score by grouping assets into industries and/or regions and attributing relatively high correlation to those credits that share the same industry or region. The correlation in defaults across different industries/regions is addressed by stressing default rates (using stressing factor λ) to account for the variation in such rates over time. Moody's are evaluating alternative sources of default correlations such as stock price movements (filtered to remove the correlations that are unrelated to default behaviour) or factor analysis applied to Moody's own historical ratings transition database.

Given a full set of default correlations, a diversity score can be calculated by matching the first two moments of the return distribution of the actual portfolio: this gives

$$D = \frac{(\sum_{i=1}^{n} p_i F_i)(\sum q_i F)_i}{\sum\sum \rho_{ij} \sqrt{p_i q_i p_j q_j} F_i F_j}$$

where p_i is the default probability for bond i that is implied by its rating (as derived from Moody's historical default studies), q_i is 1-p_i , ρ_{ij} is the default correlation between assets i and j and F_i is the face value of bond i.

Experimentation with a variety of portfolios suggests that the homogeneous portfolio consisting of D assets adequately approximates the tail of the return distribution.

The computation of L_j must be based on a model that reflects the appropriate cash flow availability and distribution under each of the D possible default scenarios of the ideal pool, and that reflects accurately the priority of payments and the payment of all the fees involved in the transaction. Also, the analyst must make a reasonable assumption in terms of the timing of defaults and the timing of recoveries, and the model must take account of the fact that some average parameters of the ideal pool will vary with time. Coverage tests *(overcollateralisation* and *interest coverage tests)* are aimed at protecting the integrity of the CDO transaction. Important structural issues which must be considered include a changing diversity score (this may decrease as assets amortise), a "ramp-up period" (if the collateral pool is not fully in place before the closing date), liquidation of collateral, contingent equity structures, frequency of payment, and guarantees from insurers.

Evaluating credit risk models

Jose Lopez and Marc Saidenberg, Federal Reserve Bank of San Francisco and Federal Reserve Bank of New York

AN IMPORTANT question for both the users of credit risk models and for their regulators is whether we can evaluate, or backtest as it is popularly known, these models.

A major impediment to backtesting credit risk models is the small number of forecasts available with which to evaluate a model's accuracy. Whereas value-at-risk (VaR) models for daily market risk calculations generate about 250 forecasts in one year, credit risk models can generally produce only one forecast because of their longer planning horizon. Also, only a limited amount of historical data on credit losses is available — probably not enough to span several macroeconomic or credit cycles. These data limitations create serious difficulties for users' own validation of credit risk models and for validations by third-parties, such as external auditors or bank regulators.

We propose a method for backtesting credit risk models based on cross-sectional simulation. Specifically, models are evaluated not only on their forecasts over time, but also on their forecasts at a given point in time for simulated credit portfolios. Once the credit loss forecasts corresponding to these portfolios are generated, the underlying model can be evaluated using statistical tests commonly used for VaR models: these are relatively simple, are well known in the forecast evaluation and risk management literatures, and are general enough to be used on any type of credit risk model.

Although our approach cannot avoid the limited amount of yearly data available on credit defaults and rating migrations, it provides quantifiable measures of forecast accuracy that can be used for model validation, both for a given model and across models.

Backtesting simulated credit portfolios

The data limitations for evaluating credit risk models are considerable. In terms of a panel dataset, credit data is generally plentiful in the cross-sectional dimension, but scarce in the time dimension. This limitation has led the users of credit risk models to construct alternative methods, such as "stress testing", for validating these models. However, as per the evaluation of VaR models, the ability to compare a credit-risk model's forecasts to actually-observed outcomes is more desirable. In this paper, we present evaluation methods that specifically focus on quantitative comparisons of this type.

Methods commonly used for forecast evaluation in time-series analysis can be adapted for use with panel-data analysis, such as credit-risk modelling. The intuition behind such forecast evaluation is to test whether a series of out-of-sample forecasts exhibit properties characteristic of accurate forecasts. This idea can be extended to the cross-sectional element of panel data analysis. In any given year, out-of-sample predictions for cross-sectional observations not used to estimate the model can be used to evaluate its accuracy. As long as these additional out-of-sample observations are drawn independently from the sample population, the observed prediction errors should be independent. Standard tests for the properties of optimal predictions can be then used to test the cross-sectional model's accuracy.

For evaluating credit risk models, we propose to use simulation methods to generate the additional credit loss observations needed for model evaluation. The models in question can be used to forecast the loss distributions corresponding to the simulated portfolios, and these forecasts and the corresponding observed losses can then

be used to evaluate the accuracy of the models. The simulation method used here to generate these additional credit portfolios is simply resampling with replacement from the original panel dataset of credits.

Consider a credit dataset that spans T years of data for N assets, where N > T. In any given year t, let $\rho \in (0,1)$ denote the percentage of credits to be included in the resampled portfolios. We can construct a resampled portfolio by generating N independent draws from the uniform distribution over the interval [0,1]. For each draw above ρ, the associated credit is assigned a weight of zero and is not included in the resampled portfolio. For each draw below ρ, the associated credit is assigned a weight of one and is included in the resampled portfolio.We would expect the resampled portfolio to contain ρ*N credits, on average.

Let ΔP_{it+1} denote the change in value of resampled portfolio i over a one-year horizon. Credit model m can be used to generate the corresponding loss distribution forecast $\hat{F}_m(\Delta P_{it+1})$. For each of the T years, we resample with replacement R times (ie, i = 1,...,R), where R is a large number (say, 1,000). Doing so, we have (T * R) forecasted loss distributions with which to evaluate the accuracy and performance of model m, as opposed to just T forecasts based on the original credit portfolio. We can then use a variety of statistical tests to evaluate the accuracy of these model forecasts, such as the binomial test commonly used to backtest VaR models.

Given the data limitations discussed, the T available years of credit data for model evaluation may not span a macroeconomic or a credit cycle, not to mention the larger number of such cycles that would be ideally available. Although the proposed simulation method makes the most use of the data available, evaluation results based on just one or a few years of data must be interpreted with care since they reflect the macroeconomic conditions prevalent at that time. As more years of data become available, the resampling of credit portfolios under different economic conditions provides for a sterner and more extensive evaluation of a credit model's forecast accuracy.

A comparative analysis of current credit risk models

Michel Crouhy and Robert Mark, Canadian Imperial Bank of Commerce

IN THIS PAPER we first review the new 1998 BIS Accord and CAD II for the bank's overall regulatory capital requirement. Under the new regime the trading book (on- and off-balance sheet) is subject to market risk capital charge only. But market risk encompasses two components: *general market risk* which relates to the change in market value resulting from broad market movements, and *specific risk* which relates to adverse price movements due to idiosyncratic factors related to individual issuers. Specific risk for fixed income securities is nothing else than *credit risk*. With the new 1998 BIS Accord banks have the choice between the standardised and the internal models approaches to measure both general market risk and credit risk. Contrary to the standardised approach, internal models are designed to capture portfolio diversification and concentration effects and, therefore, may provide opportunities for capital reduction through a better risk assessment. Numerical examples illustrate why the standardised approach is flawed. It can lead to a misallocation of capital that may trigger regulatory arbitrages.[1] Examples of such arbitrage opportunities are discussed.

The second part of the paper gives an overview of the current proposed industry sponsored methodologies for measuring credit risk:

1 *The credit migration approach* as proposed by CreditMetrics from the RiskMetrics Group, CreditVaR from CIBC and CreditPortfolioView from McKinsey. The first two are unconditional credit risk models, while the last one is a conditional credit risk model where default probabilities are functionally related to macroeconomic variables which are the key drivers of the credit cycle.

2 *The option pricing approach* as proposed by KMV. KMV challenges the assumption that all firms within the same credit class have the same default rate, which, in addition, is assumed to be constant and set to some historical average. Instead, KMV estimates the actual probability of default, the EDF, for each obligor based on a Merton (1974) type model of the firm. The probability of default is a function of the firm's capital structure, the volatility of the asset returns and the current asset value. The EDF is thus firm specific and keeps varying over time.

3 *The actuarial approach* as proposed by Credit Suisse Financial Products (CSFP) with CreditRisk+. CreditRisk+ applies an actuarial science framework to the derivation of the loss distribution of a bond/loan portfolio. Only default is modelled, not downgrade risk. Contrary to KMV, default risk is not related to the capital structure of the firm. In CreditRisk+ no assumption is made about the causes of default. CreditRisk+ proposes an elegant and computationally fast analytic expression for the loss distribution.

Credit risk models aim to capture spread risk, default risk as well as downgrade risk, recovery rate risk and concentration risk (portfolio diversification and correlation risk). These models generate either the loss distribution, as in KMV (analytic model) and CreditRisk+, or the entire distribution of the portfolio value at the risk horizon, say one year, as in Monte-Carlo based models such as CreditMetrics, CreditVaR and KMV (simulation model). Table 1 provides a comparative summary of the main features of the credit risk models.

The key input parameters common to all models are the exposures, recovery rates (or equivalently the loss given default), and default correlations, which are derived from asset correlations. The current state of the art does not yet allow for the full integration of market and credit risk. Market risk models assume no credit risk, and credit risk models assume away market risk and consider exposures as exogenously determined. The next generation of credit models should remedy this schizophrenia.

In the third part of the paper we compare the various credit risk models by applying them to the same large diversified benchmark bond portfolio. Consistent assumptions are made to ensure comparability of the models. Results show that models of apparently different types produce similar values at risk.

The asset return correlation model appears to be a critical factor in CreditMetrics, CreditVaR and KMV. Values at risk when correlations are forced to one are approximately 10 times greater than when correlations are assumed to be zero.

For credit migration based models, results are also shown to be quite sensitive to the initial rating of the obligors. Values at risk for speculative portfolios are five to six times greater than for investment grade portfolios. Results for CreditRisk+ are also very sensitive to default correlations as well as the standard deviation of the default rate.

Table 1: Comparison of Models

	CreditMetrics CreditVar	**CreditPortfolioView**	**KMV**	**CreditRisk+**
Definition of risk	Δ Market Value	Δ Market Value	Default losses	Default losses
Credit events	Downgrade/Default	Downgrade/ Default	Continuous default probabilities	Default
Risk drivers	Asset values	Macro factors	Asset values	Expected default rates
Transition probabilities	Constant	Driven by Macro factors	Driven by: individual term structure of EDF; asset value process	N/A
Correlation of credit events	Standard multivariate normal equity returns	Factor loading: correlation of residual risks	Standard multivariate normal asset returns (sophisticated factor model)	Correlated default processes
Recovery rates	Random (Beta distribution)	Random	Random (Beta distribution)	Loss given default
Numerical approach	Simulation/ Analytic	Simulation	Analytic/Simulation	Analytic
Return measurement	N/A	N/A	RAROC	N/A

The study concludes that all these models are reasonable frameworks to capture credit risk for vanilla bonds and loans portfolios. For derivative instruments, like swaps or loan commitments, with contingent exposures, these models should be extended to allow for stochastic interest rates. The incorporation of credit derivatives in these models creates another level of complexity, since the portfolio distribution is based on actual probabilities of default while the pricing of the derivatives relies on risk neutral probabilities. The next generation of credit risk models should address these challenging issues.

Notes

1 For a detailed discussion see "The New 1998 Regulatory Framework for Capital Adequacy" by M Crouhy , D Galai and R Mark in *Risk Management and Analysis*, ch. 1, Editor: Carol Alexander (Wiley).

A comparative anatomy of credit risk models

Michael Gordy, Federal Reserve Board, Washington

OVER THE past decade, financial institutions have developed and implemented a variety of sophisticated models of value-at-risk for market risk in trading portfolios. Much more recently, important advances have been made in modelling credit risk in lending portfolios. The new models are designed to quantify credit risk on a portfolio basis, and thus have application in control of risk concentration, evaluation of return on capital at the customer level, and more active management of credit portfolios. Future generations of today's models may one day become the foundation for measurement of regulatory capital adequacy.

Two of the models, the RiskMetrics Group's CreditMetrics and Credit Suisse Financial Product's CreditRisk$^+$, have been released freely to the public since 1997 and have quickly become influential benchmarks. Practitioners and policy makers have invested in implementing and exploring each of the models individually, but have made less progress with comparative analyses. The two models are intended to measure the same risks, but impose different restrictions and distributional assumptions, and suggest different techniques for calibration and solution. Thus, given the same portfolio of credit exposures, the two models will, in general, yield differing evaluations of credit risk. Determining which features of the models account for differences in output would allow us a better understanding of the sensitivity of the models to the particular assumptions they employ.

Direct comparison of the models has so far been limited, in large part, because the two models are presented within rather different mathematical frameworks. The CreditMetrics model is familiar to econometricians as an ordered probit model. Credit events are driven by movements in underlying unobserved latent variables. The latent variables are assumed to depend on external "risk factors." Common dependence on the same risk factors gives rise to correlations in credit events across obligors. The CreditRisk$^+$ model is based instead on insurance industry models of event risk. Instead of a latent variable, each obligor has a default probability. The default probabilities are not constant over time, but rather increase or decrease in response to background macroeconomic factors. To the extent that two obligors are sensitive to the same set of background factors, their default probabilities will move together. These co-movements in probability give rise to correlations in defaults. CreditMetrics and CreditRisk$^+$ may serve essentially the same function, but they appear to be constructed quite differently.

This paper offers a comparative anatomy of CreditMetrics and CreditRisk$^+$. We show that, despite differences in mathematical language, the underlying probabilistic structures are similar. If we consider a somewhat restricted form of CreditMetrics, then each model can be mapped into the mathematical framework of the other. This exercise allows us to describe quite precisely where the models differ in functional form, distributional assumptions, and reliance on approximation formulae.

Simulations are constructed for a wide range of plausible loan portfolios and correlation parameters. The results suggest a number of general conclusions. First, the two models perform very similarly on an average quality commercial loan portfolio when the CreditRisk$^+$ volatility parameter σ is given a low value. Both models demand higher capital on lower quality portfolios, but CreditRisk$^+$ is somewhat more sensitive to credit quality than the two-state version of CreditMetrics. It should be emphasised, however, that the full implementation of CreditMetrics encompasses a broader notion of credit risk, and is likely to produce somewhat larger tail percentiles than our restricted version.

Second, results do not depend very strongly on the distribution of loan sizes within the portfolio, at least within the range of size concentration normally observed in bank portfolios. The discretisation of loan sizes in CreditRisk$^+$ has negligible impact.

Third, both models are highly sensitive to the volatility of default probabilities, or, equivalently, to the average default correlations in the portfolio. When the standard deviation of the default probabilities is doubled, required capital increases by two to three times.

Finally, the models are highly sensitive to the shape of the implied distribution for the systematic risk factors. CreditMetrics, which implies a relatively thin-tailed distribution, reports relatively low tail percentile values for portfolio loss. The tail of CreditRisk$^+$ depends strongly on the parameter σ, which determines the kurtosis (but not the mean or variance) of the distribution of portfolio loss. Choosing less kurtotic alternatives for the gamma distribution used in CreditRisk$^+$ sharply reduces its tail percentile values for loss without affecting the mean and variance.

This sensitivity ought to be of primary concern to practitioners. It is difficult enough to measure expected default probabilities and their volatility. Capital decisions, however, depend on extreme tail percentile values of the loss distribution, which in turn depend on higher moments of the distribution of the systematic risk factors. These higher moments cannot be estimated with any precision given available data. Thus, the models are more likely to provide reliable measures for comparing the relative levels of risk in two portfolios than to establish authoritatively absolute levels of capital required for any given portfolio.

Ratings- versus equity-based credit risk modelling: an empirical analysis of credit risk modelling techniques

Pamela Nickell, William Perraudin and Simone Varotto, Bank of England

IN THIS study we consider how well credit risk models track the risks they claim to measure, and how well they might serve as a means of calculating appropriate regulatory capital for the credit exposure associated with portfolios of defaultible assets.

A fundamental difficulty in assessing credit risk is that most credit exposures have no easily observable market price. The two main methodologies adopt different solutions to this.

1 Ratings-based methods (eg Creditmetrics) use proxy data. A rating is attributed to each credit exposure, and historical rating transition probabilities and historical average spreads are used to estimate the mean and volatility of returns for each exposure. The VaR can be estimated by using estimated correlations and assuming joint normality, or by using Monte Carlo methods. (These estimated correlations are based on an ordered probit model of ratings transitions, using equity value correlations derived from a weighted average of industry and country indices, with an idiosyncratic noise term.)

2 Equity-price-based methods (eg KMV) regard a firm's equity, under limited liability, as a call option on the underlying asset value, with strike price equal to the debt level, and invert this to infer the firm's asset value. The distance of the asset value from the insolvency trigger level indicates the likelihood of default. Estimated asset values and their correlations are used to derive the value of the loan exposure portfolio.

Our study involved a direct comparison — a "horse race" — of representative ratings-based and equity-price-based methodologies when applied to large portfolios of credit exposures.

Our data requirements were substantial. Our database comprised ratings histories, price histories and cash flows for 5,546 Eurobonds, along with default-free yield curves. For the ratings-based method, we also required ratings transition matrices, default spreads, equity indices, sector classifications for the obligors, and idiosyncratic risk weightings. For the equity-price-based method, we needed liability data and equity market capitalisations for the obligors.

We focussed on the 1,430 dollar-denominated bonds over the period 1988 to 1997 (our "total sample"), and created several sub-portfolios.

The paper presented preliminary results comparing the two methodologies and found that they did not perform identically in all circumstances; differences were sometimes marked.

We also compared ratings-based VaRs for various sub-portfolios, including 4 randomly selected "quartile" samples, all US-domiciled and all non-US-domiciled bonds in the total sample, and all bank and all non-bank bonds in our total sample. The non-US obligors appeared to be the main contributors to incidences of the VaR implied by the model being exceeded in fact (an "exception" in Basel terms).

In addition to conducting empirical comparisons, if these two broad approaches to credit risk modelling are to be evaluated fully, it is important to assess the sensitivities of estimates to the various assumptions made.

With respect to ratings-based models, several questions require consideration. First, how much can forecasts of ratings transitions be improved by conditioning on, say, the level of interest rates, or the stage of the business cycle? How stable is the relationship between ratings and bond spreads? How important is the lag between changes in ratings and changes in credit spreads? For equity-price-based methods, it is important to establish how sensitive the results are to assumptions about the trigger level for insolvency. For example, should this vary across countries, depending upon insolvency legislation, and the scope for out-of-bankruptcy workouts?

Beyond these empirical investigations, there remain questions on the use of credit risk models in capital requirement calculations, regarding issues such as the interaction of credit risk and trading risks such as interest and foreign exchange risk, and the potential for back-testing of the kind performed on VaR models.

Default rates in the syndicated bank loan market: a mortality analysis

Edward Altman and Heather Suggitt, Stern School, NYU and Credit Suisse First Boston

THE MOST fundamental aspect of many credit risk models is the rating of the underlying assets and the associated expected and unexpected migration patterns. The most important negative migration is to default. While default rate empirical studies of corporate bonds are now commonplace, and recovery analysis on both bonds and bank loans is increasingly available, there has never been a study on default rates in the corporate bank loan market.

This paper assesses, for the first time, the default rate experience on large, syndicated bank loans. The results are stratified by original loan rating using a mortality rate framework for the 1991-1996 period. Ratings on large bank loans have been assigned by the major ratings agencies only since 1995. For the years 1991-1994, we assign "shadow ratings" to our bank loan sample based on the public bond ratings of the same company. Our sample includes 4,069 loan facilities from 2,184 different borrowers over the six-year issuing period. Loans are all at least $100 million with aggregate facilities in our sample of $2.4 trillion.

We find that the mortality rates on bank loans are remarkably similar to those on corporate bonds. Table 1 compares marginal and cumulative mortality rates on syndicated bank loans with those on corporate bonds for the sample period. Although not identical, these comparative rates are quite similar. For example, the five-year B-rated cumulative default rate was 9.97 per cent for bank loans and 9.24 per cent for bonds.

We also assess the bias in the magnitude of our findings given that the study period covered a benign credit cycle in the United States. When we compared five-year cumulative mortality rates for corporate bonds in the 1991-1996 and 1971-1996 periods (Table 2), the results indicated that the longer period's rates, for lower rated bonds, were two to three times greater than those for the more recent shorter period covered in our bank loan default rate analysis.

Our results provide important new information for assessing the risk of corporate loans not only for bankers but also for mutual fund investors and analysts of structured financial products, credit derivatives and credit insurance. Finally, regulators will also be interested for their assessment of bank soundness and adequate reserves.

Table 1 **Comparison of Syndicated Bank Loan versus Corporate Bond Mortality Rates Based on Original Issuance Principal Amounts (1991-1996)**

		1 year		2 years		3 years		4 years		5 years	
		Bank	Bond	Bank	Bond	Bank	Bond	Bank	Bond	Bank	Bond
Aaa	Marginal	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Cumulative	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
A	Marginal	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Cumulative	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
A	Marginal	0.00%	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.05%
	Cumulative	0.00%	0.00%	0.12%	0.00%	0.12%	0.00%	0.12%	0.00%	0.12%	0.05%
Baa	Marginal	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.54%	0.00%	0.00%
	Cumulative	0.04%	0.00%	0.04%	0.00%	0.04%	0.00%	0.04%	0.54%	0.04%	0.54%
Ba	Marginal	0.17%	0.00%	0.60%	0.38%	0.60%	2.30%	0.97%	1.80%	4.89%	0.00%
	Cumulative	0.17%	0.00%	0.77%	0.38%	1.36%	2.67%	2.32%	4.42%	7.10%	4.42%
B	Marginal	2.30%	0.81%	1.88%	1.97%	2.59%	4.99%	1.78%	1.76%	1.86%	0.00%
	Cumulative	2.30%	0.81%	4.11%	2.76%	6.60%	7.61%	8.27%	9.21%	9.97%	9.24%
Caa	Marginal	15.24%	2.65%	7.44%	3.09%	13.03%	4.55%	0.00%	21.72%	0.00%	0.00%
	Cumulative	15.24%	2.65%	21.55%	5.66%	31.77%	9.85%	31.77%	29.51%	31.77%	29.51%

Table 2 **Cumulative Bond Mortality Rates for 1991-1996 vs 1971-1996**

Original	1 year		2 years		3 years		4 years		5 years	
Rating	1991-96	1971-96	1991-96	1971-96	1991-96	1971-96	1991-96	1971-96	1991-96	1971-96
AAA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.19	0.05	0.27
BBB	0.00	0.03	0.00	0.42	0.00	0.82	0.54	1.49	0.54	1.88
BB	0.00	0.44	0.38	1.41	2.67	4.77	4.42	6.47	4.42	9.09
B	0.81	1.41	2.76	5.65	7.61	12.51	9.24	18.58	9.24	24.33
CCC	2.65	2.46	5.66	18.62	9.95	33.02	29.51	41.17	29.51	43.82

Stability of ratings transitions

Pamela Nickell, William Perraudin and Simone Varotto, Bank of England

THIS PAPER describes a study of the distribution of rating transitions using the universe of Moody's long-term corporate and sovereign bond ratings in the period 1970 to 1997. This provides 50,831 issuer-years of histories for notional senior unsecured ratings created by Moody's for all obligors who possess Moody's rated long bonds at a given moment in time.

The geographical and business sector composition of this data set has evolved over the period. Coverage has

diversified from an overwhelming bias towards US-domiciled obligors to a more even geographical spread. The industrial composition has seen a marked decline in public utility obligors and an increase in banks. It is well known that rating transitions probabilities vary across time and different issuer types. Given these changes in composition, transition matrices estimated unconditionally based on all the entities rated at a given time would change even if the underlying approach taken by Moody's is constant.

Before applying multivariate models to the data, we computed transition matrices for various sub-samples. First, we compared banks and industrials. The volatility of ratings transitions was higher for banks than for industrials, but large movements in ratings were just as likely for industrials as for banks. Many transition probabilities for banks differed from the sample average, but industrials were more similar to the sample as a whole.

Secondly, we compared obligor domiciles. Matrices for the US and UK were similar to those for the sample as a whole, while for Japanese obligors, low ratings were less volatile than for US obligors but high ratings were more volatile.

Thirdly, we compared stages of the business cycle. Default probabilities appeared to be particularly sensitive to these. For highly rated bonds, volatility fell in business cycle peaks and rose in troughs.

In calculating these transition matrices, though, we had compared the effects of various factors in a "univariate" manner (for example, comparing results for two different industries without holding constant other factors) — as had previous authors. However, for an analyst designing or using a credit risk model, what is needed is the **incremental** or *ceteris paribus* impact of the various conditioning variables upon ratings transitions. In order to evaluate these, we applied an **ordered probit model**, in which transitions were driven by realisations of a latent variable which incorporated a series of dummies for obligor type and business cycle state. From the results of this model we then generated the implied one-year transition matrices. These demonstrated:

Industry effects

Relative to industrials, it appeared that bank ratings might be thought of as reverting to some low investment-grade mean in that highly rated banks were consistently more subject to downgrades than industrials, while low-rated banks were relatively more subject to upgrades. For highly rated US-domiciled obligors, in a trough, banks were much more subject to downgrades than industrials.

Country effects

Cross-country differences were evident for high-rated obligors but appeared less important for non-investment grade issuers. Low-rated Japanese and UK obligors were more likely to experience upgrades than US obligors. For Aaa-rated banks, UK obligors were less prone to downgrades than US obligors.

Business cycle effects

Business cycle effects make an important difference especially for low-rated issuers. For investment-grade but non-Aaa-rated obligors, downgrades seemed to be just as likely in normal times as in troughs, but in both cases were clearly higher than in peak years. For sub-investment grade obligors, trough years were associated with large downgrade probabilities.

We then considered multi-period ratings transitions. By assuming that changes in the business cycle were themselves driven by a temporally independent Markov chain, we were able to calculate default rates at various time horizons. As expected, we found that differences in default probabilities between, say, banks and industrials, diminished as the horizon increased.

The interpretation of models of ratings transitions is complicated by the dispersion of data, with its geographical bias, and the paucity of information on UK and Japanese defaults. A more fundamental question is the extent to which ratings measure obligor credit standing as opposed to the assessment and processes of a rating agency. However, an understanding of the behaviour of ratings is an essential ingredient in credit risk modelling. Our study has allowed the influence upon rating transition probabilities of the type of obligor and stage of the business cycle to be both identified and quantified.

Credit risk and risk neutral default probabilities: information about rating migrations and defaults

Gordon Delianedis and Robert Geske, UCLA

DEFAULT PROBABILITIES are important to the credit markets. Changes in default probabilities may forecast either credit migrations or default. Such changes can affect the firm's cost of capital, credit spreads, bond returns, and the prices and hedge ratios of credit derivatives. While ratings agencies such as Moody's and Standard and Poor's compute historical default frequencies, option models can also be used to calculate forward looking or expected default frequencies. In this paper, we compute risk neutral default probabilities using the diffusion option models of Merton (1974) and Geske (1977). It is shown that the Geske model produces a term structure of default probabilities. Thus, a forward default probability is also computed. While this default term structure can be as complex as defaulting on each scheduled payment, in this study it only includes default on the short and the long term liabilities on the corporation's balance sheet. In an event study we show that these risk neutral default probabilities from both the Merton and Geske models possess significant information about credit rating migrations and default, often more than a year before the event. While the sample of firms that actually default is small, changes in the Geske short term default probabilities appear to detect impending migrations to default most significantly. This may indicate that the short term default probability can detect impending cash flow problems caused by the significance of current liabilities. This is consistent with an inverted term structure of default probabilities, where prior to an impending default, the short term default probability can be higher than the forward default probability. Finally, since rating migration and default events are not a surprise, it appears that the diffusion approach to credit migrations and default may be as or more appropriate than the Poisson approach.

The intersection of market and credit risk

Robert Jarrow and Stuart Turnbull, Cornell University and CIBC, Toronto

ECONOMIC THEORY tells us that market risk and credit risk are intrinsically related to each other and are not separable. For risk management, this implies that we must simultaneously address market and credit risk. We start by describing the two main approaches to pricing credit risky instruments: the structural approach and the reduced form approach. We then review the standard approaches to credit risk management — CreditMetrics, CreditRisk$^+$ and KMV. These approaches are of limited value, if applied to portfolios of interest rate sensitive instruments.

Empirically it is observed that returns on high yield bonds have a higher correlation with the return on an equity index and a lower correlation with the return on a Treasury bond index than do low yield bonds — see Duffee (1998) and Shane (1994). The KMV and CreditMetrics methodologies cannot reproduce these empirical observations given their assumptions of constant interest rates. Altman (1983) and Wilson (1997) have shown that macro economic variables appear to influence the aggregate rate of business failures. We show how to incorporate these empirical observations into the reduced form Jarrow-Turnbull (1995) model. The volatility of the credit spread can be used to determine the sensitivities of the credit spread to the different factors. Correlation plays an important role in existing methodologies. Here default probabilities are correlated due to their common dependence on the same economic factors. We discuss the implications for pricing, given different assumptions about a bond holder's claim in the event of default. We compare the Duffie-Singleton (1997) assumption to the legal claim approach, where a bond holder's claim is assumed to be accrued interest plus capital. Default risk and the uncertainty associated with the recovery rate may not be the sole determinants of the credit spread. We show how to incorporate a convenience yield as one of the determinants of the credit spread. Incorporating market and credit risk implies that it is necessary to use the martingale probability distribution for pricing and the natural probability distribution to describe the value of the portfolio in order to calculate the value-at-risk. We show how to generalise the CreditMetrics methodology in order to incorporate stochastic interest rates.

Simulating correlated defaults

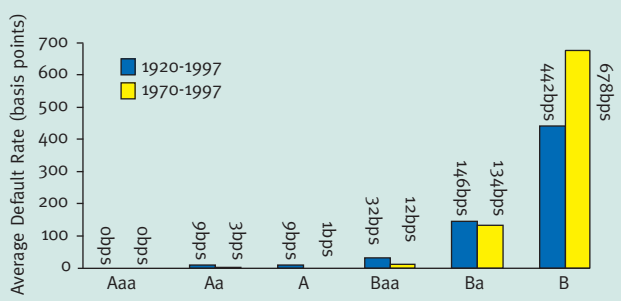
Darrell Duffie and Kenneth Singleton, Stanford University

COMPUTATIONALLY EFFICIENT methods for simulating default times for positions with numerous counterparties are central to the credit risk-management and derivative-pricing systems of major financial institutions. The likelihood of default of a given counterparty or borrower in a given time period is typically small. Computing the distribution of default times or losses on a large portfolio to reasonable accuracy may therefore require a significant number of simulated scenarios. Our paper describes several computationally efficient frameworks for simulating default times for portfolios of loans and OTC derivatives, and compares some of the features of their implied distributions of default times.

Our focus is on the simulation of correlated credit-event times, which we can treat for concreteness as the default times of a given list of entities, such as corporations, private borrowers, or sovereign borrowers.

To put the computational burden of a typical risk-management problem in perspective, consider a hypothetical portfolio consisting of 1,000 randomly-selected firms rated Baa by Moody's, and suppose the risk manager is interested in 10-year scenarios. As indicated by the average default rates for 1970-97 in Chart 1, Baa firms experienced default at a rate of 0.12 per cent per year on average, over this period. Our sample portfolio of 1,000 Baa firms would thus have experienced an expected total of approximately 12 defaults over this 10 period. A "brute-force" simulation of default times for the portfolio using, say, daily survival-default simulation would call for 10 x 365 x 1,000 = 3.65 million survive-or-default draws per 10-year scenario for this portfolio.

Chart 1: One year, weighted-average default rates by Moody's rating



Source: Moody's 1998

Given random variation in exposures at default, we find that estimation of "long-tail" confidence levels on total default losses for this sort of portfolio would require simulation of roughly 10,000 scenarios, calling for billions of survive-or-default random draws. (Variance-reduction or importance-sampling methods would probably reduce the computational burden.)

Fortunately such computationally intensive algorithms are unnecessary for many risk-management and pricing applications. Instead, one can use a variant of the following basic *recursive event-time* simulation algorithm for generating random multi-year scenarios for default times on a portfolio:

1 Given the simulated history to the last default time T_k, simulate the next time T_{k+1} of default of any entity. If T_{k+1} is after the lifetime of the portfolio, stop.

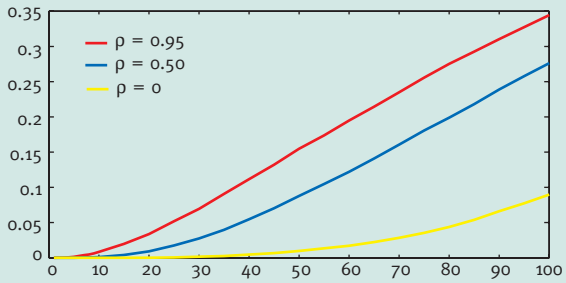
2 Otherwise, simulate the identities of any entities defaulting at T_{k+1}, as well as any other variables necessary to update the simulation model for the next default time.

3 Replace k with k+1, and go back to Step 1.

Algorithms based on recursive event-time simulation are relatively efficient for large portfolios of moderate or low credit risk. For our hypothetical portfolio of 1,000 Baa counterparties, ignoring migration of credit quality for the moment, the recursive event-time algorithm would call for an average of about 120 random inter-default-time draws per 10-year scenario.

We present several frameworks that allow for random variation in an entity's credit-quality over time, while still allowing for the basic efficiency of the recursive event-time simulation algorithm. Moreover, recursive event-time simulation accommodates correlation among default times, including correlations caused by credit events that induce simultaneous jumps in the expected arrival rates of default of different counterparties.

Chart 2: Probability of an m-day period within 10 years having 4 or more defaults (1,000 entities, intensity exponential Ornstein-Uhlenbeck, parameters θ = ln(0.0017), σ = 1, κ = 0.5, pair-wise shock correlation ρ)



For bank-wide risk management decisions, one may be interested in the likelihood that there will exist *some* interval of a given length, say 10 days, within the given multi-year planning horizon, during which default losses exceed a given amount of a bank's capital. This could be useful information, for example, in setting the bank's capital, structuring its portfolio for liquidity, or setting up provisional lines of credit. For accuracy in this calculation, it would be necessary to simulate the default times of the different entities to within relatively fine time slots, say daily.

Under the obvious proviso that the underlying probabilistic model of correlated default times is appropriate, we show that the recursive event-time algorithm is also well suited for this task, as it generates the precise default times implied by the model, scenario by scenario. When implemented for some hypothetical portfolios, we find that such measures as the distribution of losses for the "worst two weeks within 10 years" are particularly sensitive to one's assumption about correlation among entities.

For example, suppose default arrival rate "intensity" processes for each of 1,000 entities are log-normal[1], with a volatility of 100 per cent, a rate of mean reversion of 50 per cent per year, and an initial default arrival intensity of 17 basis points.

Chart 2 illustrates the role of correlation among intensity processes. Chart 2 shows the probability that there exists some *m*-day period (from a portfolio horizon of 10 years) during which there are at least 4 defaults out of an original portfolio of 1,000 counterparties. The cases shown are for various levels, 0, 0.5, and 0.95, for the pair-wise correlation ρ of the Brownian motions driving individual intensities. For example, with uncorrelated intensities (ρ=0), the probability that there is some 50 day period within 10 years with at least 4 defaults is under 1 percent. At a correlation of ρ=0.5, this probability climbs to almost 9 per cent.

The working paper provides these and other results for alternative intensity and correlation models. We focus particularly on the implications for portfolio default losses of credit events that cause major and simultaneous shocks to the default intensities of a potentially large set of entities. The results illustrated in Chart 2 for a log-normal model are shown to be easily magnified by injecting correlation into the joint-credit event timing, holding individual entity default risk constant.

Notes

1 To be precise, we suppose that the logarithm of each intensity is an Ornstein-Uhlenbeck process driven by Brownian motion. The underlying Ornstein-Uhlenbeck processes were initialised at their long-run mean level.

Determination of the adequate capital for credit derivatives as a contingent claim evaluation problem

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THE PURPOSE of the paper is to provide a practical solution to the problem of determining the adequate level of capital for complex credit derivatives. A rational computational methodology alternative to the value-at-risk (Quantile) method is introduced. This "Coherent Pricing Method" is based on the coherent analytical evaluation of the protection required against the excess default loss over and above the coverage provided by the collateral. As an example, the paper focuses on determining the capital required for default protection when both a bond and a credit default option on that bond have been purchased.

The conventional method for determining adequate capital is the VaR or Quantile method. The collateral required is set at the required confidence level (quantile) from the plot on the probability distribution for the present value of loss. This probability distribution is usually generated by the

Monte Carlo technique. This method has potentially two problems:

1 Monte Carlo simulation can be time consuming, and

2 the resulting adequate capital measure may not capture the diversification effect of the credit portfolio.

In other words, the required capital may be unreasonably high for the aggregate portfolio compared to the sum of each capital requirement in the portfolio. This problem was originally addressed by Artzner, Delbaen, Eber and Heath (1997). They applied the term Coherent Risk Measure to those risk measures where the capital required to protect a portfolio of two positions is not greater than the sum of the capital required for each position. In addition, they postulated that any methodology that calculated the required capital, whilst conforming to the Coherent Risk Measurement definition, would solve the economic problem. Artzner et al provided a coherent methodology based on a modified VaR calculation. The Coherent Pricing Method also conforms to the Coherent Risk Measurement definition, but differs from the Artzner et al solution in that it addresses both the economic and computational timing problems. Instead of using a modified VaR calculation, it focuses on pricing the contingent claim. In practice, the use of pricing methods is not new, but these have not proved to be coherent.

Pricing methods consider the pricing of a contingent claim, which covers the difference (excess loss) between the total loss incurred and the collateral allocated at the time of default. The key to pricing the contingent claim is the insurance premium necessary to cover the total loss incurred at default when the collateral is zero. The Coherent Pricing Method adjusts the required collateral until the price of the contingent claim is sufficiently small when compared to the insurance premium.

The model for pricing a contingent claim was developed by Nakazato (1997). Almost the same model was independently developed by Lando (1994). Both models are a special case of the generalised Duffie-Singleton (1997) credit model, which simultaneously captures both the interest rate risk and the credit risk. When calculating capital adequacy, it is essential to consider both the credit risk and the market risk simultaneously. In our example of the purchase of a bond and a credit default option on that bond, there are several credit risks to consider. There is a risk of credit rating changes, default of the bond, and the risk that the writer of the option (known as the protector), may default on his obligation. The Nakazato model in particular was developed to cope with the credit risk due to default from multiple parties and the risk of credit rating changes.

A notable advantage of the Nakazato pricing model is that the necessary data to evaluate the model are readily available from the market and the rating agencies. Data requirements include the current credit risk-free (Treasury) yield curve, its volatility curve, the current spread curves for each credit class, their volatility curves and the historical credit transition matrix.

Using the Nakazato pricing model, the price of the contingent claim, which covers the excess loss over the collateral, is determined analytically. The analytical solution is not trivial; in fact, the final expression is six pages long even for the simple case of default protection. However, history has repeatedly demonstrated that a model, which has an analytical solution, always provides an efficient numerical/algorithmic solution. In the case of the Nakazato pricing model, the Hull-White (1990) trinomial tree can be used to evaluate the problem efficiently, assuming a single factor. This numerical evaluation takes a fraction of a second on a standard PC. In the case of multi-factor evaluation, an efficient high dimensional lattice generation technique must be used.

The example given in the paper concerns default protection which is the most common use of credit derivatives. This contingent claim is sufficiently complex to demonstrate the flexibility of the approach, since the price depends not only on the market but also on the credit ratings and default risk of both the protector and the issuer of the protected bond. In addition, numerical examples are given to demonstrate some aspects of flexibility of the pricing model, which is essential to determine the capital adequacy of a wide variety of credit linked derivatives.

The advantage of any coherent approach is that the risk measurement captures the diversification effect. This is the essence of credit business and credit risk management.

Central counterparty clearing houses and financial stability

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Clearing houses have often been in the shadows of the derivatives exchanges with which they are typically associated. But this may be changing. There are signs that the central counterparty services that clearing houses provide could be an increasingly important part of the modern financial landscape, alongside exchanges and other trading mechanisms. The London Clearing House (LCH), for example, is about to extend its services to new markets, previously uncleared in the UK. Before the end of 1999, LCH plans to launch a central counterparty service for the over-the-counter derivatives market (Swapclear) and for the bond repo market (RepoClear); the latter is one of several plans for clearing European government bond repos. In addition, it is envisaged that trades on the joint London Stock Exchange/Deutsche Börse trading platform will be cleared by some form of central counterparty. Central banks have a core interest in understanding the ways in which these developments change the distribution of risk and the possibility of systemic risk within financial markets.[1] This article, taking a general perspective, considers why demand for central counterparty services has arisen from market participants, how central counterparties alter the distribution and form of risk, the characteristics of markets for which they might be suitable, and their implications for financial stability more generally.

The evolving role of central counterparty clearing houses

A clearing house acts as a central counterparty when it interposes itself as legal counterparty to both sides of transactions in a market. Contracts are entered into bilaterally and then transferred to the clearing house by novation. It becomes the buyer to every seller, and the seller to every buyer. This model contrasts with a bilateral or decentralised market in which participants retain credit exposures to their trading counterparties (or their guarantors) until the transaction is complete (see diagram, Central Counterparty: Simple Models).

The major central counterparty clearing house currently operating in the United Kingdom is LCH. It clears transactions on LIFFE (the London Financial Futures and Options Exchange), the London Metal Exchange, the International Petroleum Exchange and Tradepoint, an electronic exchange for UK equities.

LCH is proposing to extend its central counterparty services to over-the-counter (OTC) derivatives markets. It plans to offer clearing of standard ("vanilla") interest rate swaps and forward rate agreements (FRAs) of up to ten years' maturity in dollars, sterling, yen and euro; LCH aims to launch "Swapclear", this new service, in August 1999[2].

As central counterparty to both swaps and LIFFE-traded financial futures and options, LCH's cross-margining provisions will take account of the use of futures and options to hedge swap positions. Contracts will continue to be traded over-the-counter but, where both counterparties are accredited as Swapclear dealers (dealers in turn have a relationship with a Swapclear clearing member), they may choose to have the contract cleared centrally by LCH. Margin requirements will be calculated and paid for in a similar way to futures and options contracts, and the provisions in the event of a member default are also expected to be substantially alike.

LCH's other major new project is a central counterparty service for government bond repos, which will be known as RepoClear. RepoClear will offer its services for repo of German government bonds (Bunds) in the first instance, with repo of other major EU government bonds planned to follow at a later date. LCH will take margin on both sides of a repo trade, collecting initial margin and giving or receiving variation margin daily to cover both changes in the value of collateral and in the market value of a participant's positions. This contrasts with a decentralised repo market, in which, by definition, only one party can be over-collateralised and positions (as opposed to collateral) are not typically marked to market.

There are likely to be at least two competing central counterparties for repos of European government bonds. First, the Government Securities Clearing Corporation (GSCC) (the central counterparty clearing house for the Treasury bond market in the US) and Euroclear (an international central securities depository [ICSD]) — are working together to develop an alternative scheme for repo in euro-denominated bonds of major government issuers from early 2000[3]. Euroclear and GSCC say that the proposed service might be expanded in due course to include other instruments, and multiple currencies.

Second, in France a central counterparty clearing house, "Clearnet", is already operating for secondary market cash and repo trades in French and German euro-denominated government bonds. It was launched in October 1998, having been developed jointly by MATIF, the derivatives exchange, SBF Paris Bourse and Sicovam, the French central securities depository. In the future, Clearnet aims to allow margin offsets against MATIF futures contracts.

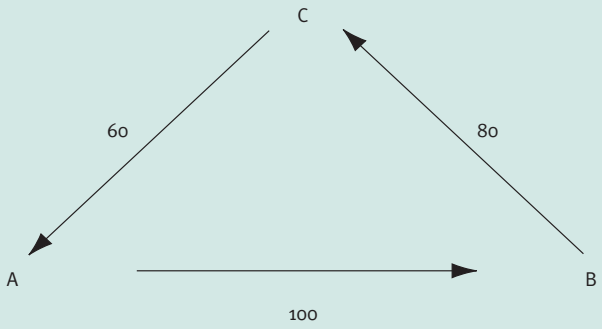
Meanwhile in the equity market, the consultative paper released in March of this year by the London Stock Exchange: Deutsche Börse alliance states that their planned joint order book will probably be accompanied by "some sort of central counterparty".[4] This raises the prospect of a central counterparty for secondary market trades on the proposed common European share trading platform. It is not yet clear how this would be owned or structured, although central counterparties do already exist in a number of equity markets worldwide: for example, for trades on the Paris and Amsterdam Stock Exchanges and in the US equity markets (including the New York Stock Exchange and NASDAQ), which are cleared by the National Securities Clearing Corporation (NSCC).

Along with the recently-announced link-up between Cedelbank (an ICSD) and Deutsche Börse Clearing (the German CSD) — which Sicovam has indicated it will join — the Stock Exchange alliance is one of the most prominent examples of planned consolidation within European capital markets. Central counterparty clearing houses may have a important part to play in this emerging European market infrastructure.

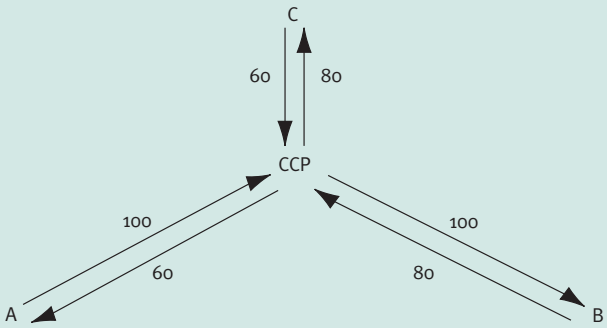
What features of a market affect the suitability of central counterparty clearing?

Not all markets are necessarily suitable for central counterparty clearing. The potential benefits that a central counterparty can bring may come at a cost and in some markets may simply not be available. Whether a market is suitable for central counterparty clearing can therefore be

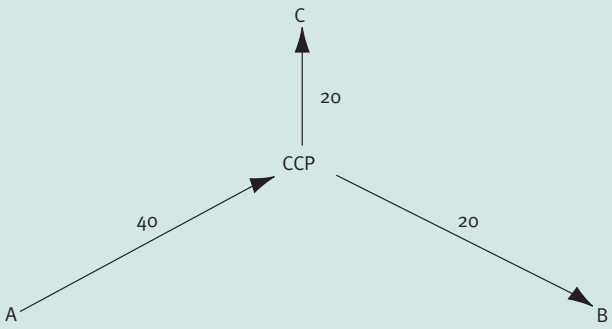
Central Counterparty: Simple Models



Bilateral model In this model, each of the market participants has a legal relationship with, and separate gross exposure to each of the other participants.



Central counterparty model, without multilateral netting In this model, each of the market participants has a legal relationship with and gross exposure to the central counterparty only, regardless of the identity of their counterparty in the underlying trade.



Central counterparty model, with multilateral netting In this model, each of the market participants has a legal relationship with and net exposure (net of all of their trades in the market) to the central counterparty, regardless of the identity of their counterparty in the underlying trade.

determined by the trade-off between potential costs and benefits to market participants (including any social costs and benefits). This section outlines the key questions relevant to determining whether a central counterparty would enhance market efficiency and promote financial stability.

First, counterparty credit risk should be an unwanted by-product of trading activity, rather than a risk deliberately taken by market participants to enhance returns.[5] This would suggest that, in general, firms want to take on market risk — in other words, to take on exposure to the future price movements of a particular asset. Alternatively, the type of trading may preclude a detailed assessment of counterparty credit risk — for instance, pit trading in futures markets relies on firms trading on the basis of the best price offered. If the credit quality of market participants is relatively uniform and counterparty exposure is an inherent but unwanted consequence of trading in the market, sharing risk by pooling or insurance is more likely to be attractive because of the limited opportunity to reduce risk by screening of counterparties based on credit analysis.

Of course a central counterparty is not the only means of controlling counterparty credit risk. Indeed, in most markets participants use mechanisms such as counterparty exposure trading limits, collateralisation and (in recent years) credit derivatives to address the effects of counterparty default. These mechanisms are not mutually exclusive, and indeed may be used in a market intermediated by a central counterparty.

Another key feature of a market affecting its suitability for central counterparty clearing is the scale of counterparty exposures. In general, counterparty risk will be of greater concern to market participants where credit exposures are more volatile or prolonged. In some markets, pre-settlement credit risks may already be low — perhaps if the price volatility of the instrument being traded is relatively low or the settlement cycle is short (as in most cash markets).[6] In such cases, the additional benefits of a central counterparty may not be material.

If the traded good is standardised (perhaps with relation to maturity date and underlying instrument), and market participants have created offsetting exposures, a central counterparty can make settlement by offset feasible, because it is the counterparty to every trade.[7] Settlement by offset means that a firm can extinguish a position by entering into an equal and opposite trade with any other central counterparty participant. In a decentralised market,

this would neutralise market risk but at the cost of increasing counterparty risk, by adding a credit exposure to the new counterparty without affecting the credit exposure to the original counterparty. It is often attractive, particularly in a futures market where the purpose is to take on price risk rather than to receive the underlying instrument, for firms to close out exposures before settlement. Indeed, Edwards (1983) asserts that "the ability to settle contracts by offset is a critical element of a futures market: without offset, futures contracts are not liquid financial instruments and will not attract the same degree of market participation". This is less likely to be a strong motivation in the cash markets, where participants are typically keen to obtain the underlying instrument.

A further and related advantage is the possibility of multilateral netting of exposures, including for balance sheet reporting where accounting standards allow. The diagram shows the effect of netting. Multilateral netting reduces participants' balance sheet size, which can facilitate greater activity in a particular market. The scope for multilateral netting is greatest in markets where a number of firms trade intensively amongst each other, with each firm both extending and receiving credit, creating a web of bilateral exposures. Again, this is most typical in an inter-dealer market. Because it becomes the counterparty to every trade, a central counterparty can allow these exposures to be netted off provided the netting is legally and operationally robust. Market participants say that the possibility of multilateral netting of balance sheet exposures is the most important benefit to them from adopting the central counterparty model in repo markets. In other markets, however, major participants may already have in place separate bilateral or multilateral netting arrangements, which would limit the further reductions in exposures that netting through a central counterparty could bring.

Where a clearing house acts as central counterparty to several markets which are subject to identical or highly correlated risks, the benefit of exposure netting may extend to market risk. This creates the possibility of margin offsets where firms are long in one market and short in another (for instance, margin against a long position in a bond futures contract might be offset against margin against a matching short position in repo). To the extent that supervisors recognise these offsets where a central counterparty exists and not otherwise, regulatory capital requirements may also be lower. So there may be economies of scope in central counterparties clearing for a number of linked markets.

Box 1
Lamfalussy Minimum Standards for Netting Schemes

The "Lamfalussy" minimum standards for cross-border and multi-currency net payment systems, as outlined in BIS (1990), provide a useful starting point for considering whether netting systems more generally are operationally and legally robust. While recognising that the ultimate responsibility for risk management lies with participants, the Lamfalussy report recommends, at a minimum, that:

- netting schemes should have a well-founded legal basis (under all relevant jurisdictions);
- participants should understand how the netting scheme alters the balance of financial risks;
- systems should have clearly-defined procedures for managing credit risks, which incentivise participants to manage and contain the risks they bear;
- systems should have the resources to settle all the outstanding positions of any single participant;
- systems should have fair and open admission criteria;
- systems should have reliable technical systems and back-up facilities.

The operational intensity of the market may also encourage the development of a central counterparty. For example, in a decentralised repo market, the volume of bilateral collateral movements is a major source of operational risk: in particular, where chains of linked transactions require securities to pass through many hands in a short time as part of the settlement process. The alternative of a single net movement of collateral to the central counterparty from each clearing member (settlement netting) should reduce the risk of failed trades. Equally, a standardised process for valuation of securities, margin calls and payments of dividends on repoed stock should make the market more straightforward and reduce back office costs.

In some markets the central counterparty may facilitate anonymous trading. This can be attractive to firms that, for example, may not want to reveal that they are large buyers or sellers because they fear a market impact. In the first instance, anonymous trading requires a trading platform that allows market participants to place orders without

disclosing their identities (eg they might put trades on an electronic order book or use inter-dealer brokers). Such a system, however, raises the problem that it leaves market participants with bilateral exposures to unknown counterparties of which they cannot undertake a credit assessment. Firms may be reluctant to take this risk. The attraction of a central counterparty is that participants are exposed to a standard credit risk, whatever the identity of their trading partner. There are, however, other solutions to this problem, including insurance and the use of limits.

Potential costs and risks accompany the benefits of a central counterparty. As with any risk pooling or insurance scheme, central counterparties are vulnerable to adverse selection. Firms with above-average creditworthiness may choose not to use the central counterparty, because it reduces their comparative credit advantage. In particular, if the central counterparty sets uniform margin requirements to protect itself against firms with average credit quality, more highly-rated counterparties may decide to trade bilaterally so that they do not have to provide margin. Trades through the central counterparty will then be biased towards the less creditworthy firms.

But adverse selection is less likely if the creditworthiness of firms in the market is relatively uniform or if there are other powerful reasons for trading through the central counterparty that encourage more creditworthy firms to do so, such as the benefits of multilateral netting or settlement by offset. Central counterparties are therefore better suited to markets where these conditions apply. For example, direct membership of the central counterparty might be limited to the main dealers in a market so that only those dealers have direct exposures to the central counterparty, and would clear trades for non-members (in practice, markets are usually tiered in this way, to a greater or lesser extent). Credit quality is then kept relatively uniform and a single margining framework for all is acceptable.

Alternatively, the central counterparty might set margin on the basis of the creditworthiness of individual firms, provided it can find a fair and reliable means of credit assessment.

Risk allocation

A central counterparty does not of itself remove credit risk from a market.[8] If a market participant becomes insolvent, its losses will still be borne by some or all of its creditors in some manner. Rather, a central counterparty redistributes counterparty risk, replacing a firm's exposure to bilateral credit risks (of variable quality) with the standard credit risk on the central counterparty.[9] Some tests of whether this redistribution benefits society include:

Market model	Loss allocation
1. Bilateral, decentralised market without collateralisation.	Market counterparties of the insolvent firm with outstanding exposures share losses with other creditors in proportion to the size of their claims (after any secured, or higher-ranking creditors have been discharged).
2. Bilateral, decentralised market with full collateralisation of potential exposures.	Market counterparties of the insolvent firm are protected by collateral; its other, unsecured creditors bear losses.
3. Bilateral, decentralised market with liabilities "accepted" (guaranteed) by third parties.	Acceptors or guarantors of the insolvent firm's market exposures share losses with its other creditors in proportion to the size of their claims.
4. Market with a central counterparty, which takes initial and variation margin to cover its actual and potential exposure in full.	The central counterparty is protected by the margin payments it has received; unsecured creditors of the insolvent firm bear losses.
5. Market with a central counterparty, which is backed by a mutual guarantee fund to which all clearing members contribute. No margin taken.	Central counterparty shares losses with other creditors of the insolvent firm in proportion to the size of their claims (although the central counterparty might have a lien over a particular contract); in turn, clearing members share the losses to the central counterparty according to the rules of the guarantee fund.
6. Market with a central counterparty, which is backed by a third party (eg external insurance) rather than margin or a fund.	Third party shares losses with other creditors of the insolvent firm in relation to the size of their claims.

... A central counterparty does not of itself remove credit risk from a market. Rather, a central counterparty redistributes counterparty risk, replacing a firm's exposure to bilateral credit risks (of variable quality) with the standard credit risk on the central counterparty ...

- whether those now at risk are better able — and more willing — to bear the risk than those exposed previously;

- whether the redistribution reduces transactions costs by improving the monitoring of risk, for example by improving the information available to those at risk or their agents;

- whether the redistribution reduces transactions costs by aligning risk and reward better in the market and thus improves incentives for market participants to control and monitor risk; and

- whether the redistribution improves transparency and predictability, so that it is clear where the potential losses would fall. Where this is unclear, asymmetric information about exposure to risk has the potential to create systemic problems.

The table on the previous page sets out some possible models for financial markets and describes where losses would fall following the insolvency of a counterparty as a result of an exogenous decline in its net worth.

In practice, most central counterparties combine elements of models 4, 5 and 6. Safeguards against the default or insolvency of a participant can take three forms: those designed to minimise the probability of failure of a market participant, those designed to minimise the loss to the central counterparty if one should fail, and those concerned with who bears any losses that do arise.

The first of these categories concerns the financial resources (eg capital adequacy requirements) and other initial conditions that the central counterparty requires of any firm seeking direct access to its services. In this way, it imposes a minimum standard of creditworthiness on the firms to which it may be exposed.

The second category relates to the collateralisation of positions taken by individual participants using margin requirements (model 4). Margin is paid in cash or high-quality bonds to cover the current, and often the possible future, value of amounts owed to the central counterparty as a result of positions taken.[10]

Initial margin is deposited at the start of the transaction. Variation margin is called when positions are revalued during the course of a transaction, using the procedure known as "marking to market". This usually occurs daily although, in some cases, it is more frequent and intra-day margin might be called, particularly if market movements are large. Margin requirements can either be calculated on a gross basis, with separate margin required for every position, or a net basis, with long positions netted against shorts and margin required against the aggregate position only.[11] Broadly, gross margining gives the central counterparty better protection against large price swings, and increases the incentive for clearing members to collect full margin from their customers, but it is correspondingly more onerous for market participants.

The third category concerns what happens when a market participant is unable to meet a margin call and defaults, leaving the central counterparty with uncollateralised losses. It will usually attempt to crystallise the loss immediately by closing out the defaulting member's proprietary positions and closing out or transferring any customer positions to other market participants. Central counterparties can then have various ways of allocating losses. These may include a pre-funded guarantee fund to which market participants have contributed ex ante or an arrangement to recover losses ex post from market participants that have agreed limited or unlimited liability (model 5). Recourse to shareholders' funds (if the central counterparty is privately owned) or third party insurance cover may be used alternatively or in combination (model 6). Losses may either be shared equally or perhaps

weighted towards those that had traded most with the defaulting firm.

How does the redistribution of risk that a central counterparty brings stand up to the four tests set out above? In other words, how do models 4, 5 and 6 compare with models 1, 2 and 3?

Risk sharing In a decentralised market, losses from direct credit exposures following the default of a counterparty are likely to fall disproportionately on a few exposed firms. Market participants may prefer to replace this risk of a potentially large loss with a more predictable chance of a smaller loss. This will be more so where they feel they cannot reduce counterparty risk significantly through bilateral limits: for example, where the credit risk of market participants is relatively homogenous and where full participation in the market requires the firm to trade with a wide variety of names. The use of a central counterparty with a guarantee fund to which all contribute (model 5) achieves this risk-sharing. Firms are able to hold less capital individually.

By pooling the capital that they devote to bearing counterparty risk in the market, firms in effect ensure that the capital is deployed where it is most needed. In this way, central counterparties with a member default fund have the potential to improve social welfare. Central counterparties where third parties (eg insurance companies) bear losses (model 6) may also reduce the cost of risk bearing if these external providers are more willing to bear the risk of default than market participants in a bilateral market.

Risk monitoring The central counterparty is likely to be able to monitor a firm's aggregate exposure within a market more easily than each of its counterparties in a decentralised structure, which can see only their own bilateral trades. In addition, firms may be more open with a central counterparty than with bilateral counterparties which are also potential competitors (indeed, this might be a condition of membership). The central counterparty can impose surveillance requirements, such as the reporting of large trades conducted by a member's customers. This better information puts the central counterparty in a good position to monitor counterparty risk effectively, even if it is still not able to see risks taken by its members in markets that it does not clear. A central counterparty can also give market participants central confirmation of trades and positions, as well as independent daily valuation of positions, which may help to improve their monitoring of exposures to market risk.

Incentives to manage risk It is less clear that a central counterparty structure creates better incentives to manage risk. In a decentralised market, firms remain exposed to counterparty risk when they enter into a transaction. They therefore have a direct incentive to manage that risk — for example, by monitoring credit quality, taking collateral and marking it to market. Interposing a central counterparty removes that direct incentive to consider credit risk at the time of the trade, because the risk is transferred to the central counterparty. Rochet and Tirole (1996) develop the idea that a decentralised model of interbank credit exposures may maximise social benefits by increasing the incentive for banks to monitor their peers. They argue that "the flexibility afforded by decentralised interbank transactions can be made consistent with protecting the central bank against undesired rescue operations", as long as this flexibility corresponds to effective peer monitoring (and "restoring the central bank's credible commitment not to intervene in most cases of bank distress").

One way to guard against excessive risk-taking within the central counterparty model is to require market participants to collateralise any exposure that the central counterparty has on them, using initial and variation margining.[12] In the event of the firm making large losses in its trading activities, this reduces the availability of assets to repay unsecured creditors and shareholders, compared with a position in which no collateral had been granted. If margin is collected on a gross basis by the central counterparty, then a clearing member has a greater incentive to collect margin from its own (non-clearing member) customers to meet their requirements at the central counterparty, so that margin reflects more accurately the underlying positions.

It is important that market participants do not regard the central counterparty's guarantee of performance as a free good. Ideally the central counterparty should be structured in a way that gives market participants a continuing interest in the credit quality of the entities with which they trade and in the central counterparty's ability to monitor and control its credit risk. Equally, market participants should not feel able to treat the effective credit enhancement that the central counterparty gives them as costless. For this reason, firms should remain at least partially exposed to any additional risks that they take in search of higher returns in the underlying market.

One means of preserving such incentives is to give market participants a direct exposure to any losses of the central counterparty. For example, contributing to a default fund (particularly where a participant is subject to top-up calls

Box 2 Central Counterparty Clearing Houses in Crisis

Caisse de Liquidation (Paris) (1974)[14]

Prices in the Paris White Sugar Market doubled between September and November 1974, but were then subject to a correction. This volatility was partly caused by the entrance into the market of speculative investors, who may not have been fully aware of the risks they were taking. Some clearing members put forward orders on behalf of their customers without obtaining their prior authorisation. Many participants were unable to meet the margin calls to meet this market volatility, and the losses of one sugar operator in particular, the Nataf Trading House, prompted the Ministry of Commerce to close the market.

The clearing house (Caisse de Liquidation) exacerbated the situation in three ways:

- it did not adjust margin requirements, which were set on absolute amounts, to respond to the rapid rise in prices, even after being requested to do so by market participants in September;

- it was aware that one clearing member (Nataf) held a sufficiently large proportion of the sugar futures contracts in the market to have an effect on market prices, but failed to inform the exchange; and

- the allocation of losses was not transparent.

A regulation, Article 22, was applied, so that on the reopening of the market contracts would be settled at the average price of the last 20 days (which was considerably higher than the price at the suspension of trading). This was followed by considerable legal wrangling, which included a decision by a court of appeal to reverse this judgement, and the refusal of two of Nataf's guarantors to cover the sums they were deemed to owe. The clearing house, which was liable to settle the outstanding contracts, became insolvent when it was clear that its shareholders were not indemnified. The sugar market did not reopen until June 1976, under new clearing rules.

Kuala Lumpur Commodity Clearing House (1983)

Massive defaults on the Kuala Lumpur Commodity Exchange Palm Oil contracts occurred following market concentration, a squeeze on prices and an accumulation of uncovered selling positions by a particular broker. As a result, six brokers defaulted on positions of $70 million and trading was suspended.

A task force, set up by the Malaysian government, issued a report that laid much of the blame for the crisis on management inaction in the clearing house: in particular there was a period of 12 days between the market squeeze and the broker default, during which margin was raised but disputed contract registrations were not speedily addressed and emergency powers were not invoked. Officials at the three-year-old Kuala Lumpur Commodity Clearing House lacked experience, and lack of co-ordination between the exchange, the clearing house and the Commodity Trading Council was highlighted.

The task force also focussed criticism on brokers who, they felt, should do more to assume their share of the risk monitoring — in particular, showing due caution in the acceptance of clients and not trading beyond their abilities. Higher minimum capital requirements were suggested as a means of improving the quality of brokers and that brokers should leave deposits with the exchange in relation to the volume of their trading. The latter was a rudimentary attempt at margining as the deposits were to be related to the volume rather than the risk of trades. In conclusion, though, the task force recommended that the central counterparty be re-established.

Hong Kong Futures Guarantee Corporation (1987)[15]

During the stock market crash of 1987, both the stock and futures exchanges in Hong Kong were closed for four days. It was clear that the value of long positions in the Hang Seng Index future would fall dramatically when the futures exchange reopened, which prompted fears that participants would default on margin calls. Indeed, the fear that the scale of losses would exceed the total reserves of the guarantee fund prompted the government and private institutions to prepare a rescue package for the fund, much of which was required to meet defaulters' positions.

The guarantee fund (HKFGC) was separate from the clearing house (ICCH (HK) — itself separate from the futures exchange). This meant that there was an asymmetry of information and risk: the clearing house was responsible for monitoring positions, but was not exposed to losses in the event of default, whereas the guarantee fund was exposed to losses but dependent on the clearing

house for its risk monitoring. This meant not only that the guarantee fund was exposed if information was not effectively shared, but that traders, who were not exposed to the losses of the guarantee fund, had little incentive either to monitor the clearing house's risk management or to follow prudent trading strategies. In practice, there had been failures of risk management: for instance, margin on the main Hang Seng Index future had not been raised in line with the 2,000 per cent growth in turnover of the contract in the two years since it had been introduced.

Despite the fact that these failures in the management of the clearing house actually increased risks in the system during the crash, the report of the committee set up to investigate the response of Hong Kong's financial system to the stock market crash of October 1987 (Hay Davison 1988) recommended that a central counterparty should be re-established. The committee recommended that it should act as counterparty to every trade, and that part of its risk should be backed up by a fund made up of deposits from clearing members, and part laid off externally (via a guarantee from a banking syndicate or insurance).

The committee argued that the advantages of having "a single body to monitor and control the risks in the system on the basis of daily information on the position of all the brokers in the market" and the operational benefits outweighed any possible disadvantages associated with the concentration of risk, as long as effective risk management can be assured. It described the prudent operation of central clearing houses as "perhaps the single most important objective for market authorities and regulators."

as well as up-front contributions) might give them a reason to ensure that the central counterparty's risk management procedures are adequate. It also reduces any incentive to take excessive trading risks or trade with less creditworthy counterparties in search of higher returns. There is, however, a danger that the mutualisation of risk may still lead some firms to exceed the levels of risk that they would be willing to bear privately, since they will be exposed to only a proportion of any losses — in other words, the costs to an individual participant will not necessarily reflect the risks that they have introduced into the system.

Finally, it is important that those at risk of loss if the central counterparty faces a default are able to monitor and give incentives to the management of the central counterparty to ensure that its risk control procedures reflect their appetite for risk. This suggests that the providers of the central counterparty's guarantee fund or other capital should also be its owners, or at least that management should be accountable to them in some way. It also suggests that the central counterparty should be transparent regarding its risk exposures.

Transparency and predictability of risk-bearing In a decentralised market, each firm knows its own exposures to other counterparties but rarely does it know their exposures to each other. So it is unclear where all the losses will fall following a counterparty default or even how large they will be. The losses also fall unevenly across the market, depending on which firms had trades outstanding with the failed firm at the time of the default. This can leave firms unwilling to trade with large numbers of other firms after the failure of a major market participant for fear that other firms are heavily exposed and therefore at risk themselves. In this way, indirect contagion from a failure reduces market liquidity more generally.

A central counterparty has the potential to prevent this indirect contagion because it should be clear ex ante where the total loss falls and how it will be shared. A vital condition, however, is that the allocation of any losses is transparent, recognised by those at risk and adequate given the potential scale of those losses. If it is uncertain where losses will fall, or those bearing the risk underestimate it, the central counterparty may, in fact, reduce transparency.

A key requirement is that the allocation of losses according to the rules of the central counterparty cannot be overturned under domestic law: in the case of any cross-border transactions, the allocation must be robust under all relevant jurisdictions.

An important factor in reducing any such ambiguities in Europe is the EU's Settlement Finality Directive (SFD), which is to be implemented in all Member States by December 1999. The SFD protects transfer orders and collateral in payment and settlement systems against any risk that they will subsequently be unwound, particularly following the insolvency of a participant.[13]

In summary, a central counterparty has the potential to reduce the aggregate cost of risk bearing within a market

Box 3 Prominent clearing houses

This box describes some prominent clearing houses which act as a central counterparty for markets other than financial futures and options exchanges.

Since October 1996, the London Clearing House has been a private company owned by its 112 members and the three exchanges for which it clears — LIFFE, the London Metal Exchange and the International Petroleum Exchange.

LCH also clears for Tradepoint, the electronic equity trading market. It is the world's third largest clearing house in terms of volume (and second largest in terms of open interest). Unusually, LCH is neither a department of an exchange nor owned exclusively by banks. It is also unique in that it clears for four markets and accepts nine currencies.

LCH becomes counterparty to trades completed on one of the four exchanges within one hour of the close of trading at that exchange on the day of the trade. Both initial and daily variation margin are calculated on a net basis, so that each member's daily net profit or loss, valued at the daily settlement price, is paid out or recovered daily. LCH routinely calls for margin intra-day when price movements in one or more contracts approach current margin levels. Money settlement occurs on T+1 (for sterling, euro and US dollar trades).

In the repo market, the most significant clearing house that provides multilateral netting is the Government Securities Clearing Corporation (GSCC), in the USA. GSCC is a subsidiary of the National Securities Clearing Corporation (NSCC) which is owned by a consortium of exchanges, but GSCC itself is around 80 per cent owned by market participants. Repos are netted with participants' other US government securities trading activities. Since 1996, GSCC has accepted brokered repos executed on an anonymous basis. If a default exceeds the participant's margin and clearing fund deposits, the remaining loss is allocated amongst those members who had traded the most recently with the failed firm.

The only major market in which OTC derivatives are currently cleared to any significant extent is Sweden, where the derivatives exchange and clearing house OM Stockholm (which is owned by outside shareholders rather than its members) clears both off-exchange standard contracts and tailor-made contracts (although so-called "exotic" derivatives tend not to be offered since margin requirements are typically high for such products). Broadly the same procedures are used for OTC as for exchange-traded contracts, and initial and variation margin is provided in the same way. If a participant's losses cannot be covered by the margin it had posted, OM itself will meet the requirements. It also has third party insurance against losses. OM serves a primarily domestic market.

through sharing, better monitoring and greater transparency. But it must be structured to preserve incentives to control risks as far as possible and so that the allocation of risk is clear. Box 2 describes a few cases where central counterparties throughout the world have experienced problems in the past because incentives were wrong or the allocation of risk was opaque.

Effects on financial stability

A central counterparty, by definition, concentrates and re-allocates risk. As such, it has the potential either to reduce or to increase the systemic risk in a market.[16] In general, there are good reasons to suppose that a central counterparty can insulate a market against crisis. But this requires the risks arising to be identified, priced fully and backed by adequate capital, and the procedures for allocating losses to be clearly defined and made transparent.

If the procedures followed are not predictable and transparent, then the presence of a central counterparty in a market may serve to exacerbate systemic risk. A particular problem may occur if market participants do not share in the default risk to the central counterparty and so have no interest in the exposures that it takes on. If there is not some incentive compatibility between the backers and users of the central counterparty — in other words, if the users do not have an exposure to the losses of the central counterparty — the users may be less likely to trade prudently, increasing the overall levels of risk in the market.

Even if the central counterparty's risk management procedures are in theory sound, their effectiveness is still dependent on the competent implementation of those procedures by its management. The concentration of operational risk in a central counterparty is considerably greater than that in any individual participant in a

... there are good reasons to suppose that a central counterparty can insulate a market against crisis. But this requires the risks arising to be identified, priced fully and backed by adequate capital, and the procedures for allocating losses to be clearly defined and made transparent. ...

decentralised market, and the repercussions of incompetent management would be correspondingly larger.

Management failings and inadequate risk monitoring by market participants may be more likely if it is ambiguous or ill-defined where any losses to the central counterparty would fall. There is a risk in such circumstances of a general presumption that the authorities would intervene to bear any large losses and provide support, which creates a danger of moral hazard. In order to address this risk it is vital that the allocation of any losses is clear ex ante and that the central counterparty's resources are adequate in relation to the risks to which it is potentially exposed.

A central counterparty can also provide a bulwark against more indirect forms of market contagion during a crisis. Specifically, it can reduce the level of asymmetric information in the market, and so make liquidity crises less likely. For example, if participants in a decentralised market know that one of their number has collapsed, they may not know who was exposed to that participant, and might suspect that one, or a few of their number would have taken a disproportionate share of the losses and might be close to collapsing themselves. In such a situation, market participants might prefer not to trade in the market at all. With a well-constituted and managed central counterparty, market participants know that losses have been mutualised (or insured against), and that it is consequently less likely that another participant is exposed disproportionately. In this way, a central counterparty could benefit market liquidity in a crisis. By the same token, though, if there are doubts about the solvency or the competency of the central counterparty itself, the whole market might refuse to trade.[17] Again, this highlights the need for the central counterparty to be transparent about its own financial position.

As disussed, it is likely that at least three central counterparties will be competing to clear repos in European government bonds from next year. Competition between service-providers raises new issues since until now central counterparties have typically been monopoly suppliers to one or more exchanges. It will be vital that central counterparties do not compete by reducing risk management standards or the transparency of risk allocation. Some market participants believe that, in the long run, one system will come to dominate the market, which would maximise their netting and offset opportunities. As new market participants use a particular central counterparty, they will benefit existing users by giving them additional netting opportunities and additional opportunities to settle by offset. The existence of such network externalities suggests increasing returns to scale. The example of the US, where GSCC is the only large provider of repo netting facilities (even though Delta was the first provider to come to the market) also points in this direction.

A single central counterparty providing its services to multiple markets also raises additional issues. On one hand, this concentrates risk (both credit and operational) to an even greater extent. Even without market disruption, there may be problems of organising the guarantee fund (where there are significantly different participants in the markets cleared, who may have divergent interests), and in ensuring

a consistent level of monitoring of participants, where the markets cleared are located in different jurisdictions.

Yet at the same time central counterparties can obtain significant benefits for their participants from diversifying across markets — such as cross-margining. Moreover, they are in a much stronger position to monitor participants' overall trading books (information that could also under certain circumstances be passed to supervisors or market authorities, for instance if there is a threat to a firm). A central counterparty's ability to monitor participants' positions is a potentially large benefit to financial stability — indeed, in some instances, the central counterparty may be in a better position than supervisory authorities.[18] Equally, if members bear a clear and unambiguous shared liability for any losses incurred in the market, their incentive to ensure that each member's positions are effectively monitored is correspondingly strong.

If the presence of a central counterparty leads firms to believe falsely that they have eliminated counterparty credit risk from the market, and they therefore trade recklessly, and if the central counterparty's risk management fails to prevent these excesses, then central counterparties can be a threat to financial stability.

Previous failures (though rare) provide some cautionary tales. Yet a central counterparty that functions well can reduce transactions costs and the cost of risk bearing, producing social benefits in increased market efficiency, liquidity and confidence. Arguably this can occur without any overall increase in systemic risk. This is potentially compatible with a variety of structures of ownership, guarantees and insurance — but paramount is that there should be definite incentives for market participants and the central counterparty management to manage risk prudently, and a predictable and transparent allocation of the residual risks.

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Notes

1 The Bank of England's interest in central counterparty clearing houses derives from its responsibility for the "overall stability of the financial system as a whole", and for promoting "the efficiency and effectiveness of the financial sector, with particular regard to international competitiveness", as set out in paragraph 2 of the Memorandum of Understanding between HM Treasury, the Bank of England and the Financial Services Authority. See also Leigh Pemberton (1989) and Bank of England (1989).

2 LCH press release, 9 July 1998: "LCH announces Swapclear go ahead".

3 Joint press release, 15 March 1999: "Euroclear and GSCC initiative to provide repo netting services".

4 London Stock Exchange and Deutsche Börse European Alliance Joint Briefing, March 1999.

5 The clearest example of the latter is the loan market, in which an assessment of credit risk by the lending bank is integral to the purpose, and hence the pricing and terms, of the transaction.

6 Shortening the standard settlement cycle in itself reduces credit and market risk, although it may increase operational risks if participants' systems are unable to cope with the shorter time frame.

7 The existence of a central counterparty may induce moves towards standardised contracts — for instance, if the basis of multilateral netting is common maturity dates. If the central counterparty clears for more than one market, it may also be possible to settle by offset across markets.

8 This point is raised in the Bank's 1989 discussion paper on payment and settlement systems: Bank of England (1989).

9 Clearing houses rarely become central counterparty precisely at the point of trade (usually doing so at the end of day on trade date). This means that the underlying counterparties to the trade still have a period of bilateral exposure (albeit typically only an intra-day one).

10 In some central counterparty clearing houses, participants may be granted an exemption from limits and/or lower margin requirements for trades which are undertaken for the purpose of hedging underlying positions in the cash market rather than for speculation. Under such circumstances, it is vital that the central counterparty clearing house obtains accurate information about the nature of the positions held by clearing members and their customers. Moody's Investors Service (1995) gives an example that bears this out: in 1993, MG Futures Inc (the US trading affiliate of the German metals and mining conglomerate Metallgesellschaft A.G.) had taken out a position in energy futures on the New York Mercantile Exchange (NYMEX) to hedge its parent's long-term supply agreements and received a hedging exemption from NYMEX position limits. "As futures prices declined steadily toward the end of 1993, MG Futures Inc experienced a liquidity problem stemming from the margin calls on its short-term position hedging longer-term contracts. MG Futures Inc had to liquidate its position at large losses, which nearly caused the collapse of its parent" (p6).

11 For instance, of the major central counterparty clearing houses, LCH, BOTCC, DBAG, SOFFEX, MATIF, MONEP, TIFFE and GSCC/NSCC calculate margin on a net basis, whereas the OM, SIMEX and NYMEX use gross margining. BELFOX and OCC both apply net margining to clearing members, but require gross margining for underlying clients. On May 17 this year, the CME changed its margin requirements for the house accounts of clearing member firms from a gross margin to a net margin basis.

12 It is of course important to ensure that any security posted as collateral or margin is relatively liquid, that its price is not excessively volatile, and that the central counterparty is aware of the time at which settlement with finality is achieved.

13 The London Clearing House is currently protected against specific areas of UK insolvency law by virtue of Part VII of the Companies Act. The SFD will additionally ensure that LCH cannot be challenged by liquidators in other EU countries.

14 For further information, see Simon (1981).

15 See Hay Davison (1988) for further details.

16 It is worth noting in this context that a central counterparty cannot address, and indeed is itself exposed to settlement and operational risks in payment and securities settlement systems. Bank for International Settlements (1997), for instance, recommends that central counterparty clearing houses should "[strengthen] arrangements for meeting margin obligations by utilising payment systems and securities settlement systems that provide real-time or at least intra-day finality of transfers".

17 *The Report of the Presidential Task Force on Market Mechanisms* (Brady 1988), which examined the market break in the US in October 1987, discusses concerns about the ability of the clearing house of the Chicago Mercantile Exchange to meet its obligations (similar problems were faced by the Options Clearing Corporation). It reports that fears of a default led some market makers to curtail their activities and contributed to investor uncertainty more generally, inhibiting market liquidity. According to the then rules of the clearing house, those members with intra-day margin obligations resulting from the sharp price correction on October 19 were required to post the margin on the day itself, but the clearing house did not pay out margin owed until the next day — indeed, not until after members had met any new margin calls on that day. Under such circumstances, members would usually have looked to their commercial bankers for liquidity, but some banks were unwilling to lend, partly because they feared that the clearing house would fail to collect all of the high margin payments and consequently be unable to meet its obligations. In the event, the CME clearing house made all its margin payments as they fell due, and market liquidity was sustained by the Federal Reserve, but uncertainty regarding the clearing house served to exacerbate market volatility. See also Bernanke (1990).

18 Hay Davison (1988) in the report of the committee that investigated the response of Hong Kong's financial system to the stock market crash of October 1987, placed considerable importance on the social benefits arising from the ability of central counterparty clearing houses to monitor their participants' positions. For instance, the report recommended that "machinery should be established to ensure that the senior management and surveillance staff of the two [Stock and Futures] Exchanges and their respective clearing agencies co-ordinate properly and fully; and further that there should be no obstacles to a proper and full exchange of information". Further, the commission recommended that the exchanges should "establish relations with other market authorities and supervisors to ensure that they would be warned if one of their members was experiencing difficulties; for example, the futures clearing house should be confident that it will be told by clearing houses elsewhere in the world if a member of the HKFE [Hong Kong Futures Exchange] member has defaulted on a margin payment. It is equally important that there should be reciprocal arrangements, with warnings going out from the Exchanges and clearing houses, if they detect problems with a Hong Kong dealer".

'Euro-regulation'

A speech given by Howard Davies, the Chairman, of the Financial Services Authority, at the European Financial Forum in Brussels, on 8 April 1999

January 1, 1999, marked the culmination of a 30-year dream to create a common currency in Europe resulting in a single monetary policy with a unified structure of interest rates run by an independent central bank. Of course in the UK there are those for whom this dream remains a nightmare. But it is not my aim here to debate the merits and demerits of the euro, rather to look beyond EMU to the evolving structure of Europe's financial markets, and their future regulation. And from my point of view, as a regulator in London, the euro is as much of a day-to-day reality as it is for anyone in the eurozone. The overnight euro market in London regularly clears €40bn, 80 per cent of euro short-term interest rate contracts are traded on LIFFE, and 40 per cent of the Stock Exchange's business is in euro-area stocks.

THE REVOLUTION in the conduct of economic policy has been accompanied by the clear separation, in most countries in the euro-zone, of the functions of banking and market supervision from the conduct of monetary policy and its implementation. And the last decade has seen the gradual evolution of the single market in financial services across the EU. The architecture of that single market is now largely in place, with a comprehensive set of directives acting as the foundation stones.

So are we now moving into calmer waters? (The Channel excepted, it goes without saying.) Can Europe's financial authorities now sit back and watch their magnificent creation develop and flourish?

I do not think so. Indeed my view is that we will continue to see major changes in Europe's financial markets over the next few years, changes which will require imaginative and innovative responses from the authorities. The impetus for some of these changes can be sourced to EMU or to the working out of the implications of the single market. But there are other powerful forces at work too: technological change, and new competitive dynamics.

My aim in this lecture is to sketch out some of these changes, and offer some speculative thoughts on what they may mean for national supervisory authorities, and for the Commission.

Structure of the financial services industry: consolidation and conglomeration

The task of financial supervision is very different now from what it was a decade or so ago. The speed of change, and the complexity of the changes under way, are calling into question traditional methods of supervision and the traditional structures within which supervision is effected. Technological change is perhaps the most pervasive factor. It has led directly to internationalisation, disintermediation, excess capacity in some areas, diversification, design of new products, increased competition, and above all to pressures on overall profitability of existing firms, pressure only temporarily obscured when markets are rising.

Developments in the storage, transmission and processing of data, combined with remote banking and e-money, are globalising domestic players and bringing formerly distinct markets together, challenging the sovereign protection sometimes granted to hitherto domestic markets and rendering physical location far less important. As well as causing institutions to rethink their geographical structure, to move bulk processing to lower-cost centres and to outsource, they also oblige them to adjust their

management structures to manage products on global lines, undermining the traditional structure of firms based on location and regional geography.

Against this background, there has been increasing consolidation of firms in the same line of business and moves towards conglomeration, the offering of a wider range of financial services in more complex group structures. In some countries, the question of who is dating whom and whether and when they will tie the knot is a matter of daily speculation. There are also *ménages à trois*, in countries where such alliances are part of the national tradition.

We now see trends to consolidation among banks and insurance companies in many European countries. The current excitements within France, Italy and Spain are only the most recent examples. We have also seen consolidation cross-border within Europe, particularly in Scandinavia and in the Low Countries, and a continuing acceleration in minority cross-share holdings, particularly involving banks in Germany, France, Italy and Spain.

In the UK, Commercial Union and General Accident have merged; Axa now own Sun Life and (nearly) Guardian Royal Exchange. We have also seen take-overs crossing the EU border. There is Deutsche's current purchase of Bankers Trust, ABN Amro's earlier rise to be the largest foreign bank in the US, and HSBC's equivalent position in Canada.

Alongside those mergers of commercial or universal banks we have seen the continued construction of groups offering a wide range of financial services. This has included the addition of investment banking operations to commercial banking groups, particularly through purchases over an extended period by European and North American banks of firms in London designed to facilitate participation in global capital markets. At the same time, there has been an increasing tendency to create groups combining banking, capital markets, investment management and insurance businesses. Sometimes, as in Nordic countries and the Netherlands, significant domestic operations in two or more disciplines are combined in a single group. The same can happen cross-border with financial institutions of varying relative sizes, with Generali acquiring BSI, ING Group acquiring BBL and Private Kas, AXA acquiring Anhyp or Fortis acquiring Generale Bank. More frequently, there are sometimes complex minority shareholdings affiliating banks and insurance companies, often in highly elaborate shareholding structures: the examples of Allianz of Germany, AXA of France and Generali of Italy spring readily to mind. Such minority shareholdings are often designed to facilitate cross-selling of products so that an insurance company might sell investment products or a bank may sell insurance products generated by affiliates.

In the UK there have been successive periods of consolidation over many years leading to complex groups such as National Westminster or Lloyds TSB. Most recent developments point less to traditional mergers, whether domestic or cross-border (where the UK banks have not participated in the latest round of marriages) than to the creation of different channels of delivery, partly engendered by the wholly fresh entry into retail financial services of non-financial retail firms such as Marks & Spencer, Tesco or Virgin, who have in turn provoked a competitive response from existing firms like Lloyds TSB or through the creation of new combined groups such as Prudential and M&G. These groups have the potential to become financial hypermarkets, offering a huge range of their own complementary financial products and services. So far these hypermarkets are primarily domestic, but cross-border hypermarkets may represent the next phase of development.

From a regulatory perspective all this means that, in an increasing number of cases, groups will find themselves subject to regulation, both at home and abroad, under each of banking, investment business, insurance and markets regulation, in a broad range of countries with different régimes. As a regulator myself, perhaps I should welcome this cornucopia of supervision. But even I can be brought to acknowledge that you can have too much of a good thing.

Structure of financial services regulation: response by the legislator

It is in response to these developments in the market that there have been moves to create single or at least fewer national regulators in order adequately to supervise groups of growing size and complexity. Within Europe, Sweden, Denmark, Norway and, *de facto*, the UK already have single regulators, with a prominent example outside Europe in Japan, and there are many more cases where banking and investment business supervision have been combined. That has happened recently in Luxembourg, for example.

Less frequently, insurance and banking is brought together. That is so in Canada. In Ireland, Greece, Austria and the Netherlands the supervisory structure is known to be under review and the case for a single regulator is being evaluated. In most other EU countries the issue is under unofficial or informal debate.

Rationale for creating a single regulator in the UK

In the UK, of course, in our impulsive Latin way we jumped straight from a complex, multi-regulator system to a single regulator, in one bound. Why did we do so, in a market whose size meant that even the sectoral regulators were quite large by international standards? Briefly, we think a single regulator can deliver advantages for financial institutions and for consumers. The move to a single regulator matches the evolution of both markets and institutions. And, though the parallel with hypermarkets can be overdone, a single regulator allows us to offer a one-stop shop for institutions. Financial institutions have told us that they do not like dealing with a multiplicity of regulators as they have had to do in the past. They find that confusing and expensive. They frequently have to answer similar questions or, indeed, in some cases, precisely the same questions from different regulators. A whole range of separate regulators make their own assessments of their capital adequacy, of their management and of their systems and controls.

A single regulator can make one overall assessment of those underlying factors relating to the health of an institution, but then specialise within an institution on different business lines.

A single regulator also facilitates international regulatory co-operation. It greatly simplifies our links with other regulators and our ability to look at the global risks being run by British-based institutions. There is no doubt in the UK who the co-ordinating supervisor or lead regulator for any UK institution is. It allows us, also, to simplify procedures. We are in the course of consolidating into one rulebook 14 different conduct of business rulebooks in operation in the retail sector in the United Kingdom, including the different rulebooks of recognised professional bodies. Our aim is that the new rulebook should be significantly shorter than any of the individual components.

These efficiency improvements mean that a single regulator can reduce the direct costs of regulation, even though the numbers of people involved in regulation in the UK are already low by European standards. By way of example, the combined staff numbers of the regulator and central bank in the UK amount to around 4,500 people, while the numbers employed in the central banks and banking supervisor alone, excluding other regulators, in each of the other three largest EU countries range between roughly 9,000 and 16,000 people each. Work done for the Wallis Commission in Australia showed the direct cost of regulation in London as the equivalent of 51 basis points on assets, compared to 69 in France, and 99 in the US. This is part (though by no means all) of the reason for the concentration of financial business in London. Simplified rules in the future will not only allow us further to reduce the direct costs of regulation but also the costs within institutions, which are usually considerably greater than the out-of-pocket costs of regulation.

But regulation, while it must be sensitive to the needs of financial institutions and markets, is not for those institutions. It is there, ultimately, to protect consumers. We also believe that a single regulator is better for consumers who were confused about the previous system. In future, there will be a one-stop shop for them too in the form of one place to come for complaints, one ombudsman scheme, one compensation scheme, all underpinned by two new statutory objectives, to promote consumer understanding of the financial system and to protect consumers.

Lastly, we believe that the system will introduce a clearer system of accountability. Both Parliament and the public have sometimes found it hard to understand precisely who is accountable for the regulation of the many different parts of the financial system. There will be no doubt in future who is accountable for the regulatory regime, for its cost, and the need for the enforcement policies it operates. Clarity of our accountability in respect of institutional or market failure has also been improved with a Memorandum of Understanding between the FSA, the Bank of England and the Treasury which sets out very clearly to which institution Parliament and the public can look for an assessment of the reasons why an institution has failed and the case for rescuing it if there is such a case.

Finally, statutory objectives in our new legislation will set out a clear basis to Parliament and the public on which they can assess the effectiveness of what we are doing.

The future supervisory and regulatory regime in Europe

You would expect me to be enthusiastic about the advantages of a single regulator, and indeed I am. I am not, however, so enthusiastic as to think that it is the only possible model of regulation. It can work particularly well in a very open, yet concentrated market like London's; elsewhere other structures may be more appropriate. But I am quite sure that we will see more consolidation of regulatory structures within EU member states in the next few years.

Domestic consolidation is, though, not the only response needed to change in Europe. There are other changes needed too, if the single market, especially with a single currency, is to work effectively in the service of Europe's peoples.

Many of you will have read Tommaso Padoa-Schioppa's important speech at the London School of Economics in February, when he discussed the supervisory regime in Europe and its relationship with the European Central Bank. I found myself in very broad agreement with the bulk of his analysis, on both the lender of last resort issue, and on supervision.

On the lender of the last resort, Padoa-Schioppa helpfully cleared away some of the mists of confusion surrounding this fraught subject. Academics seem to have been rather more exercised by the question of whether the division of banking supervision in Europe from the ECB raises new problems in this area than have market participants.

For me the principal question is whether, in the euro-zone, banking supervisors will be able to make sufficient information available promptly to enable those in a position to provide support to make a judgement on whether to do so or not. I do not believe that this should be any more of a problem in the relationship between the banking supervisors of the euro-zone and the responsible authorities than we believe it is in the UK between the FSA, the Bank of England and the Treasury.

A second concern is whether cross-border banking groups raise fresh problems, both in deciding who should be responsible for support and in relation to the magnitude of the support needed. Up to this point, and for the immediately foreseeable future, I remain unpersuaded that this is a serious issue either.

The current system of directives requires that each bank has its mind and management and registered office in the same location, so that each bank retains a distinct national base. Even where banking groups may be divided roughly equally in size between countries, the supervisors concerned have put in arrangements to ensure full collaboration between them and an appropriate division of responsibility so that there are clear arrangements for working together and establishing who is the consolidating supervisor for the banking group. So we remain some way off from the coming into being of "stateless" banking groups in Europe. Even where these groups extend beyond banking a single supervisor is likely to have a much readier grasp of the condition of the whole group at a moment's notice than a widespread college of individual supervisors.

The last issue relates as to who in the euro-system should provide the actual support. Padoa-Schioppa reminds us that the provision of central bank money is only one category of emergency action and that, as has in practice been most frequently the case in recent years, there are other categories, namely taxpayers' funds and private money provided by banks or other market participants. He argues that the probability that a modern bank is solvent, but illiquid, and at the same time lacks sufficient collateral to obtain regular central bank funding, is quite small.

Nevertheless, if this rare event were to occur, and to pose a systemic threat, he makes it plain that the euro-area authorities have the necessary capacity to act, and that in the circumstances various national arrangements would continue to apply, including those concerning the access of central banks to supervisors' confidential information. To the extent that there was a generalised liquidity effect that had implications for the conduct of monetary policy, then the euro-system as a whole would be involved.

As for the organisation of banking supervision, his view was that, while the Maastricht Treaty provides for the possibility of greater formal centralisation through the ECB of "specific tasks concerning policies relating to the prudential supervision of credit institutions and other financial institutions with the exception of insurance undertakings", on unanimous approval by member states, the case for such centralisation was not made out. Padoa-Schioppa argues that the necessary co-ordination could be achieved by co-operation between national authorities.

This must be right, and indeed there is no provision for any form of "federal" enforcement procedures through "federal" courts such as the SEC or Fed possess in the US, and I very much doubt whether financial services will achieve federal status in advance of other aspects of the European constitutional arrangements. The Treaty is also silent on how and by whom such centralised policies should be implemented.

Indeed in my view it is more likely that market developments, continuing along the lines I have described, may point more strongly towards the creation of single national regulators, because of the need to deal with the pressing supervisory issues raised by such conglomerates, than towards a pan-EU supervisor of banks alone. What is certainly desirable is the creation of new informal arrangements for discussions between supervisors of different disciplines in Europe, to address the issues we face in supervising the new financial conglomerates.

So concentrating banking supervision in the ECB, or indeed anywhere else, would almost certainly be quite the

wrong way to go, at a time when the boundaries between banking and other regulation are becoming blurred.

It is equally plain that on the wider international stage the same market developments suggest the need for greater international co-operation and co-ordination among supervisors, extending beyond sectoral disciplines to cover all types of financial services and, notwithstanding the special characteristics of the single market, extending beyond the EU.

This need has become crystallised in the new G7 Financial Stability Forum which meets for the first time in Washington on April 14 and will bring together the three different international organisations co-ordinating banking (the Basel Committee on Banking Supervision), capital markets (the International Organisation of Securities Commission) and insurance supervision (the International Association of Insurance Supervisors), together with the finance ministries, central banks and the leading national regulator in each of the G7 countries. It is likely that this forum will have amongst its aims the promotion of more intensive collaboration between the different supervisory disciplines.

The need for such collaboration is even more pressing in Europe, and for somewhat different reasons.

Banking supervisors in the different EU member states have well-established co-ordination arrangements between each other going back for the best part of 30 years through the informal Groupe de Contact which brings together each of the banking supervisors. There is the Banking Advisory Committee, which includes all the banking supervisors and ministries of finance, to discuss matters of EU legislation and regulation, and, most recently, there is the Banking Supervision Committee of the European Central Bank, bringing together in a single group each of the EU central banks and banking supervisors.

There are also well-established insurance committees operating both under the auspices of the Commission and co-operatively between the supervisors. The EC Insurance Committee is broadly equivalent to the Banking Advisory Committee, involving both finance ministries and supervisory authorities in discussions on insurance regulation. And the Conference of Insurance Supervisory Authorities of the EU provides a forum for the exchange of information and debate among supervisors.

Co-operation on capital markets

Europe's securities commissions have been less active in terms of international co-operation historically than the prudential supervisors, partly because they were in general created more recently. The introduction of the euro served to concentrate minds and, in the absence of a formal EU Securities Committee, the creation of the Forum of European Securities Commissions (FESCO) in December 1997 was a response to this new environment where the arrival now of the euro has coincided with an increased political will to deepen the single market in financial services. Its activities have also been stimulated by the new alliances forming between exchanges across Europe, themselves in part a response to the same changed environment (though also to technological developments).

FESCO includes 17 securities commissions from across the European Economic Area. The EU Commission has observer status while the Secretariat is provided by the member organisations.

As examples of the work on which FESCO is engaged, I offer two issues arising out of the existing EU legal framework.

Under the Investment Services Directive (ISD), a passport is available to any exchange recognised by the home state competent authority as a regulated market. This allows an exchange to provide market facilities in other member states, say, through remote terminals. The ISD, however, is all but silent on the minimum standards for granting recognition as a Regulated Market. With the development of technology and new trading systems, a real fear exists that confidence in EEA markets might be undermined by the misuse of the Regulated Market concept by a competent authority.

So what is the way forward?

One possible traditional approach would be to encourage the Commission to propose an amendment to the ISD setting out additional specific standards that need to be met before an exchange can be recognised as a Regulated Market. Alternatively, the regulators can get together and agree mutually to bind themselves to a set of standards. This is what FESCO is doing through an expert group which I chair. We believe informal co-operative action of this kind will provide a much more timely, flexible and closely-targeted response to the needs for efficient and effective market regulation in the EEA than is likely to be possible through the cumbersome and lengthy process of directive amendments.

Let me mention another example of current work. Under a whole raft of directives, a framework exists for a company to

raise funds in any member state on the basis of the mutual recognition of one set of documents. In practice, however, this does not happen. Many of the directives provide scope for member states to impose extra conditions. The evidence — lack of pan-EEA capital-raising exercises on the basis of a single set of documents — would suggest that use of this scope is sometimes obstructive, whether or not intentionally.

FESCO is planning a group to look at getting a better fit between theory and practice by seeking consensus on the standards needed to achieve the desired aim and the way in which new techniques might best be developed in the context of the existing directives. In this latter case, shelf registration is a technique issuers increasingly want to use. For shelf registration to work easily across a single market, it is likely that some legislative amendments might well be needed to the existing directives, to establish legal certainty as to whether shelf registration documents fall within the scope of the Listing Particulars Directive. But FESCO can play an important role in establishing the common standards that should apply.

These are two examples in which greater co-operation and co-ordination can help us move towards the desired goal of a genuine single market with appropriate standards that can engender the confidence of the European investor. We should not, however, under estimate the difficulty of reaching agreement among 15 EU jurisdictions. There is the complex pattern of regulatory responsibilities across the EEA and, perhaps more importantly, although business has become international, the legal framework remains largely national. It is against this background that the competitive skirmishes in Europe about the prime location of different pieces of the financial market should be seen.

This context calls for a careful balancing of the need, on the one hand, for greater co-operation and co-ordination between regulators and, on the other, the respective legislative and political responsibilities of the EU Commission and national governments. The work in FESCO will only be successful if the political will exists in Europe to deepen the single market in financial services.

A pan-European capital market

It can be seen that much of this work is directly relevant to the extremely powerful pressures to move towards unified capital markets given additional impetus by the introduction of the single currency.

The London and Frankfurt exchanges took the lead, as we know, but other European exchanges have now been brought into the project, albeit to a lesser extent so far. The eventual outcome of this initiative is by no means clear at this stage. Will there be a single trading platform located in one jurisdiction, or an exchange with common characteristics and perhaps common technology, located in a number of different national jurisdictions? Or will both exist side by side, catering for different segments of the market?

Whatever the outcome, there will be tough questions posed for regulators. In the former case, what is the role for national regulators of intermediaries operating as a remote central exchange? In the latter, how can we ensure an adequate degree of harmonisation to allow one exchange to operate in a number of different countries?

Some have argued that there is a need for a pan-European capital markets regulator. I would not rule that out in the long term. But the obstacles — creating a common legal framework for enforcement, for example — are immense.

I think, therefore, that, just as with the prospect for pan-European banking supervision, the prospect of pan-European capital markets supervision is relatively remote. Nevertheless, it may well be that we shall need a step-change in the level of co-operation between securities commissions. And there could be much greater harmonisation between national markets of, say, listing conditions, prospectus requirements, trading rules and measures against market abuse which might bring us closer to the ideal of a virtually unified capital market which is one of the economic prizes which monetary union is intended to deliver.

However, in the much more complex area of the range of different banking, investment business and insurance services offered across borders in the EU, as I said earlier, EMU has brought into sharp focus material shortcomings in the single market.

The Commission's review of financial services

These are being addressed here in Brussels through the Commission's Framework for Action on financial services. At the FSA we think it is indeed the right time to undertake a health check initiative on where the EU financial services single market has got to and where we want it to go from here.

We have therefore been following the Commission's work and the work of the Financial Services Policy Group, made up of Member States' representatives, with great interest. The FSA provided input to the October Communication

published by the Commission and since then has been working with the UK Treasury on various concrete contributions to the Group.

The review has potential to set the EU's agenda on financial services for the next few years but if it is to do so there will have to be a far greater degree of consensus across the EU on what we are trying to achieve.

There are areas under discussion — such as creating a single market for pensions and asset management — which would be new territory for Community requirements. However, most of what the FSA would like to see is an overhaul of the existing framework so that what we do, we do better for the benefit of the EU single market and its citizens. Examples of this are:

- timelier and more consistent implementation of legislation by member states;

- better clarification of the meaning of legislation;

- more active and consistent enforcement of Community requirements;

- addressing barriers to cross-border business by determining where requirements are and are not justified on consumer protection grounds — we suspect some barriers are industry protectionism dressed in consumers' clothing; and

- clearer and more consistent differentiation of levels of protection for customers, based on their expertise and understanding.

There are three areas of concern to us, though, on which I would like to dwell in a little more detail.

Making sure that the legislative framework is kept up to date

It is vital to the health of the single market and the protection of consumers that EU requirements are kept up to date with market developments. We are dealing with a fast moving industry and EU requirements need to keep in step.

In many areas of financial services legislation, though, over-prescriptive drafting of existing directives, coupled with lack of swift procedures to update legislation, have meant that practitioners — by which I mean the industry and supervisors — have been saddled with out-of date requirements which cannot be changed quickly enough.

To us this means that the EU needs to focus on three things:

- developing ways of making greater use of broad enabling legislation which has adequate clarity but avoids excessive prescription;

- making better use of "comitology" mechanisms — a form of making fast-track legal amendments — so that legislation can be updated more quickly and effectively; and

- consider non-legislative alternatives to, or supplements to, legislation of the kind I have described FESCO as working on.

Much of the problem with prescriptive and inappropriate drafting arises from the Commission not being able to research and consult enough on issues before they go into print on a proposal for a directive. Then the legislative process takes over and lack of consensus among member states when discussions go into Council inevitably produces horse trading.

We believe the Commission should focus more on objectives and on achieving sensible consensus. This means promoting coherence in policy-making — across sectors and across proposals, assembling the interested parties to hammer out the problems, building a basis for consensus and looking for answers in genuine peer group analysis and review before going into Council. In the current UK jargon, it is a plea for joined-up government at European level.

If we can deliver more coherent and forward-looking legislation, then the demands to update it regularly should diminish. However, comitology should have an important role to play in this. I am conscious that member states and Parliament are discussing the updating of current comitology arrangements and it is our hope that an appropriate agreement can be reached so that more effective use of such arrangements for financial services is made. I hope this plan is not seen as an attempt to subvert the role of the European parliament. It is vital that our processes are transparent and that accountability and the roles of both European and national parliaments are preserved.

We would also like to see better use made of alternatives to or supplements to legislation. This is not meant to be a means of avoiding legislation and legislative processes. Instead we believe that in setting requirements, the EU

should look at what they are trying to achieve and how best to achieve it. That may involve using techniques such as codes of conduct or supervisory agreements. The point is that the best and most appropriate method should be used to achieve the agreed objective.

Getting the right level of consumer protection

Our second key concern is that the EU and member states need to think through what they believe should be an appropriate level of consumer protection provided within the Community framework — and who is best able to provide it. This is an important policy decision.

There has been much talk in the Framework for Action about consumer protection requirements being used as a means to protect markets. Whether and how we restrict actively what is provided to consumers is a function of how we choose to balance business freedoms against consumer protections. National approaches to setting this balance differ at present; there is no point pretending that they do not. For example, one could restrict the range of products available to consumers. Another (in our view preferable) approach is to permit a diverse range of products to be sold and to protect the consumer through the establishment of standards and requirements on disclosure, and the sales process.

To achieve more harmonisation, which we think desirable as a matter of principle, we need an idea of the nature of the basic consumer protections we believe should be provided to consumers.

To date, we have not had an opportunity to explore collectively our respective views on what these minimum protections should be. Our view is that a means needs to be found — something akin to the Financial Services Policy Group — to do this.

We need to bear in mind, though, that consumer needs in the single market vary. The pan-European firm is getting closer, but even the most cosmopolitan of us are not really pan-European consumers. Our needs are different across markets, member states and cultures. They are also changing as technology, communication and public policy evolve. So it is important to ensure consumer protection which is appropriate — both in level and nature.

That means understanding how the retail markets are working and developing and what the influences on changing and continuing consumer behaviour are as well as determining what the acceptable balances between freedoms and restrictions — individual and business — are. But we also need to consider the skills people need to exercise choice in a meaningful way.

Aiming to provide total protection for consumers is both impossible and undesirable. While consumers undoubtedly need protection from fraud, exploitation and mis-selling, we all remain to some degree responsible for our own decisions.

That is where information for consumers — disclosure of information essential to their making an informed decision — and education of consumers — to assist them in making the decision itself — must be key elements so that regulatory protections are complemented by reinforcement of the consumer's ability to protect him or herself.

But if the single market in financial services is to achieve its full potential, consumers need to be confident that, if they invest across borders, their protection against fraud and malpractice is strong. At present, that is hardly the case. For most EU consumers their only route to redress if things go wrong is through the courts — which can be a slow, complex and frustrating process.

In our view all EU member states should put in place independent ombudsman-type redress mechanisms to deal with complaints against firms they regulate and those mechanisms should be accessible to consumers in other parts of the union. Consumers may wish to route their complaint through their own domestic authority — working in their own language. But that authority should pass the complaint over to the ombudsman in the state where the firm is located, and where its assets can be found so that the ombudsman can settle the complaint and, as appropriate, ensure suitable redress.

The wholesale/retail distinction in investment business

One of the FSA's statutory objectives in the draft Financial Services and Markets Bill is to secure the appropriate degree of protection for consumers, having regard to their differing experience and expertise, the general principle that they should take responsibility for their decisions, and the varying degree of risk attached to their investments. This seems to us to provide an appropriate framework for regulatory decisions: one the Commission might usefully adopt for its own decisions.

Both the UK Government and the FSA are committed to making appropriate differentiation in the regulatory treatment of professional and non-professional business, according to participants' degrees of experience and

expertise and their relative need for protection against the risks they face. This differentiation is to be achieved, though, without compromising the levels of protection required for the less expert investor.

The Investment Services Directive already makes provision for this in the application of conduct of business rules, but to date the extent to which member states have chosen to make this differentiation has differed considerably. In the UK we are used to such differentiation. It makes sense to us in terms of cost-effective regulation for authorised firms (and making regulation cost-effective is another of the new statutory obligations for the FSA), but it also facilitates innovation and allows scarce resources to be directed to where they are most needed — ensuring adequate protection for less sophisticated investors.

In the context of its Framework for Action, the European Commission has suggested that it should come forward with a Communication which will clarify the definition of professional and sophisticated investors.

This may be desirable; indeed at present we are reviewing our own definitions.

But the issues are complex. Our experience suggests that investors do not fall neatly into wholesale and retail investors. For example, there are many investors who — for reasons of size or expertise which may vary from product to product — are for some purposes wholesale and for others, retail. There are others who may be big institutions, such as fund managers, but who in practice place the funds of myriad small investors.

Conclusions

This has, necessarily and intentionally, been a somewhat diffuse presentation. I make no apology for that, since the subject matter is complex, and the market background volatile. But I think one can distil a number of firm propositions:

- First, there are powerful trends towards consolidation in European financial services: within countries and traditional sectors, and across sectors and borders. While there are no genuinely pan-European retail banks as yet, they may well develop soon, as may multi-state financial hypermarkets.

- Second, regulatory structures in member states will need to respond. The rationale is not only in order to increase sensitivity to financial institutions and markets, but also to improve delivery of consumer protection. The trend towards regulatory consolidation is well-established throughout Europe, though the end-point may not always be a single regulator on the UK model.

- Third, as cross-sectoral mergers develop, it would be wrong to recreate at EU level the combined central bank/supervisor model which is increasingly being abandoned in member states: different approaches to co-operation between central banks and supervisors, to provide input to monetary policy on the evolution of financial institutions and markets, and to inform lender of last resort decisions, are needed: again, the new UK arrangements provide an interesting model.

- Fourth, there is a clear need for more pan-European co-operation between regulators, to cope with the impact of the euro and the single market. That co-operation should also be cross-sectoral, as well as within traditional sectors. For the time being, at least, this is a more practical, and promising way forward than the notion of creating new institutions at European level.

- Fifth, this enhanced co-operation will be facilitated, and underpinned, by greater harmonisation of standards across the Union and there is a particular need to do this in relation to consumer protection. An approach to regulation based on subsidiarity and co-operation will only work with more harmonisation.

- Sixth, if EU legislation is to keep up with fast-moving financial markets, new methods of working, perhaps involving greater use of comitology, or other more flexible legislative techniques, need to be developed. We need to help the Commission respond to change more quickly than it is currently able to do.

There is a danger of seeing change as a form of problem. I have perhaps not entirely avoided that trap here. But the prize is a financial market for Europe which better serves the needs of consumers — both corporate and individual — and does so on a basis of prudence and integrity.

Payment systems in global perspective

Maxwell J Fry, Isaack Kilato, Sandra Roger, Krzysztof Senderowicz, David Sheppard, Francisco Solis and John Trundle
(Published by Routledge in association with the Bank of England's Centre for Central Banking Studies)

This is the fifth in an annual series of books discussing issues of common interest and concern to central banks. Its production was the culmination of an exercise organised by the Bank's Centre for Central Banking Studies (CCBS), which began with a major academic workshop held at the CCBS at which 22 central banks were represented; this was followed by a short research project involving three of the workshop participants plus a number of Bank staff, the results of which were discussed at the annual Central Bank Governors symposium last June. The whole exercise was supported by a major data collection exercise in which some 70 central banks participated, providing details of the structure and organisation of their national payment systems.

PAYMENT SYSTEMS are very much the "financial plumbing" of any market economy and, as such, are a core concern of central banks, given their responsibilities for monetary and financial system stability. As the title suggests, the authors have used the survey information collected to discuss the major questions of payment system design and management in a genuinely international context, drawing on experiences in developed/industrial, transitional and developing economies.

The book begins with an examination of the availability and use of alternative payment instruments, illustrates the diversity of usage across the survey group and considers some of the factors influencing the demand for and supply of such instruments.

The development of payment systems is then considered with particular attention paid to the relative importance of different types of payment system risk during this development process, and to how particular payment system design features affect payment risks.

The efficiency of payment arrangements is important both directly in terms of resource costs and indirectly in terms of effects on other economic activities. Since the 1970s, there has been an increasing recognition of the risks associated with payment systems. So one analytical approach is to examine payment system risks in an adapted Markowitz-Tobin portfolio model. In this modification, there is a trade-off between risk and cost along the efficiency frontier: risk reduction requires higher cost of payments. The book uses this approach to set the stage for more detailed theoretical analysis of what have traditionally been the two major types of payment system used for large-value payments: real-time gross settlement (RTGS) and deferred net settlement (DNS).

The recent adoption of RTGS systems in industrial, transitional and developing countries raises many interesting and important design questions.

Two are looked at in detail: system efficiency and the provision of intra-day liquidity. For any given set of payment orders, the liquidity needs are identical whether one uses RTGS or DNS. The difference is in how the liquidity is provided: largely implicitly in DNS systems, explicitly in an RTGS system.

Explicit liquidity demands are far higher for RTGS than DNS systems with, as a rule of thumb, 100 worth of gross payments capable of being settled by an end-of-day net transfer of just 1. Offsetting flows through an RTGS

system help reduce participants' liquidity needs, but it is still likely that about 10 per cent of the gross flows will be required in terms of explicit liquidity provision.

If central banks meet the significantly increased demands for intra-day liquidity produced by an RTGS environment, can they prevent this liquidity injection from "spilling over" into overnight and longer liquidity provision and thereby having monetary consequences? It is strongly argued that such consequences can be prevented in all situations, but that clear policies must be promulgated to deter banks from seeking to recover intra-day credit from the central bank at the end of the day. This is particularly important in the context of managed exchange rate regimes.

The final two chapters consider the broad question of the central bank's role in payment systems. Failure in the payment system can produce a domino effect, impinging directly on financial stability and may also handicap the central bank's monetary policy implementation. The authors focus on the role of central banks in transitional and developing countries, using Poland as the main case study; and then go on to examine the nature of the linkages between payment system policies on the one hand, and monetary policy, exchange rate regimes and financial stability on the other.

At the end of the book there is a set of detailed appendices recording the answers provided by the 70 central banks that responded to the Bank's fact-finding questionnaire.

The clear message of the book is that, while the particular payment system issues faced by individual countries will necessarily differ and present a unique challenge, there are some common themes that all central banks must address and that there is much to be gained by comparing experiences and discussing objectives, options and strategies.

Indeed, this global dimension is currently being examined by one of the main central bank working committees at the Bank for International Settlements, where a task force made up of representatives from all of the G10 group of countries, the ECB, IMF and World Bank, plus 11 non-G10 countries at different stages of development are developing a set of widely-applicable core principles for the safe and efficient operation of systemically important payment systems.

Copies of the book can be bought or ordered from all good bookshops or direct from Routledge (FREEPOST, Andover, Hants, SP10 5BR), price £50.