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INTERNATIONAL BANKING AND FINANCIAL MARKET DEVELOPMENTS

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Statistical annex
New: Separate data on bank loans and deposits for a number of offshore centres (Tables 3A–3B), broader coverage of banks currency breakdowns (Tables 5A–D), and maturity information on domestic securities (Tables 16A–D).

List of recent BIS publications

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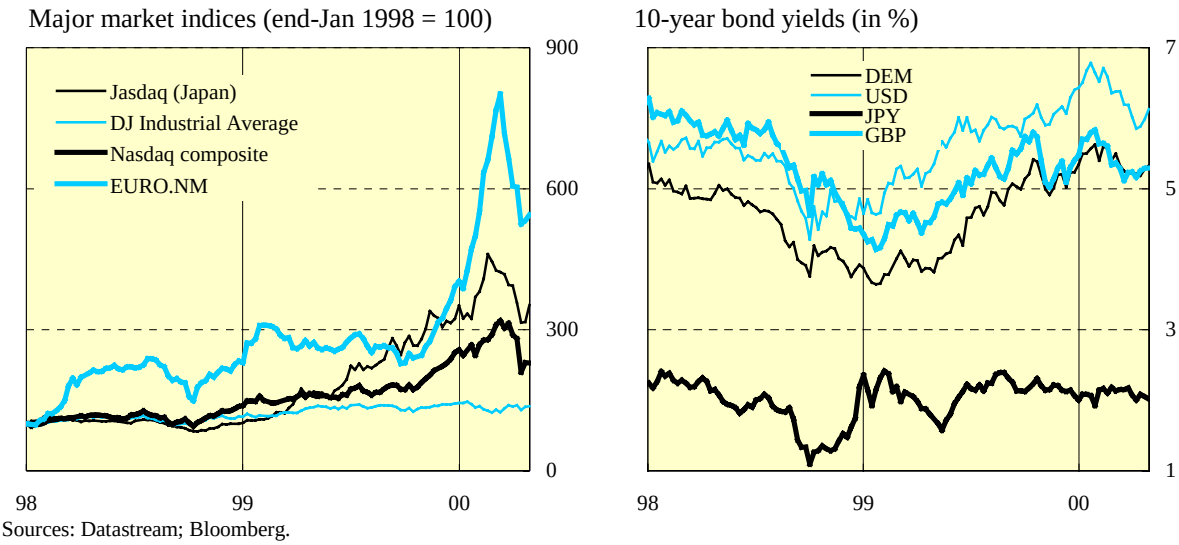
I. Overview of global financial developments: Volatility besets the markets

The first few months of 2000 were a period of heightened market volatility. The most volatile markets were the stock markets, particularly those trading technology stocks (see the graph below). However, the volatility also extended to the fixed income markets and major currencies. One source of volatility seemed to be uncertainty, engendered by data released during the period, about how much US and euro area monetary policy would tighten. Not only did the stock markets seem unusually susceptible to such uncertainty but order flows also appeared to exert an inordinate impact on prices. Moreover, participants in the US and European bond markets seemed to react more forcefully to macroeconomic news than usual, a response explained by a perception that monetary policy was entering an uncertain phase. At the same time, liquidity factors served to exaggerate the movements of US long yields.

This volatility seems to have taken its toll on investors' willingness to bear risk. Credit spreads widened by more than could be accounted for by the decline in benchmark government bond yields. An indicator based on the relationship between realised returns in a given month and historical volatility across a range of asset classes suggests that global investors became increasingly averse to risk between December and April (see the graph at the top of page 2).

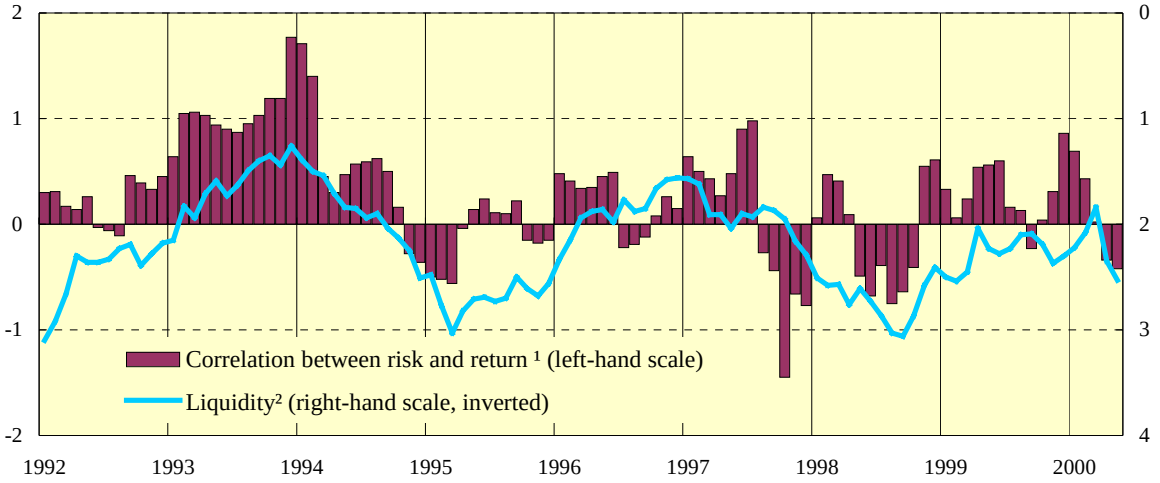
Through their own investments, the world's major banks had helped to ease credit spreads in 1999, thus encouraging a shift by international borrowers from loan financing to securities issuance (see the graph at the bottom of page 2). The most recent BIS data on cross-border transactions suggest that even when net issuance of fixed rate debt slowed in the fourth quarter of 1999, the banks continued to invest heavily in such securities. Indeed, banks appear to have had few opportunities for traditional lending. Some banks did resume a limited amount of lending to non-bank borrowers in developed countries, particularly in the form of syndicated facilities to finance mergers and acquisitions. However, borrowers from emerging markets continued to show little interest in taking out new loans.

Global stock and bond markets



Sources: Datastream; Bloomberg.

Investors' attitude towards risk and liquidity



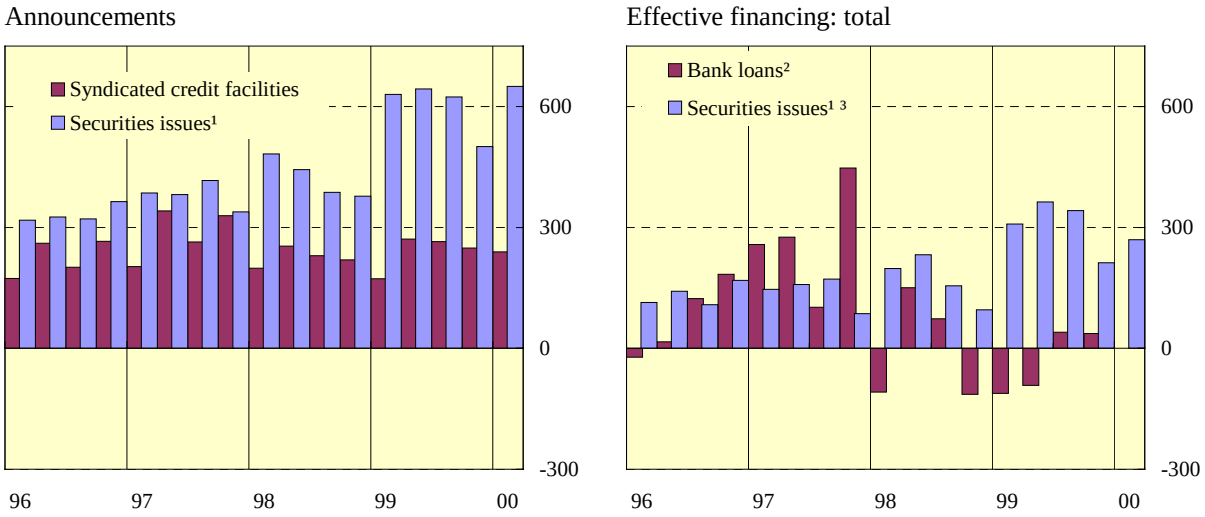
¹ Slope coefficient of a cross-sectional regression of realised returns on historical volatility for a number of asset classes. ² GDP-weighted average of overnight real rates in the eurocurrency market for the US dollar, yen, euro and sterling. A rise in the coefficient indicates greater tolerance for risk; a decline indicates more risk aversion.

Sources: Datastream; national data; BIS estimates.

In the international debt securities market, the volatility of credit spreads in early 2000 derailed many issuance plans. Not all borrowers were affected, however. Those with the highest credit ratings and some from emerging markets were unfazed by the volatility. In fact, these borrowers contributed to a recovery in international issuance activity in the first quarter. With their triple-A ratings, US housing credit agencies floated record amounts of large-sized issues in an ongoing effort to establish benchmarks. At the same time, private borrowers in Brazil and Mexico returned to the capital markets to take advantage of credit spreads that had narrowed dramatically in 1999.

Activity in cross-border bank loans and securities markets

In billions of US dollars



¹ Includes both money market instruments and long-term bonds and notes. ² Exchange rate adjusted changes in gross cross-border bank loans. Data for bank loans are available only up to 1999 Q4. ³ Gross issues minus repayments.

Sources: Bank of England; Capital DATA; Euroclear; International Securities Market Association (ISMA); Thomson Financial Securities Data; national data; BIS.

Stock markets react to macroeconomic news and order flows

The most salient feature of global stock markets during the first few months of 2000 was their volatility. After a brief downturn at the start of the year, equity prices in continental Europe resumed their ascent, while prices in the United States continued to fall. In Japan, the market fell in March but quickly recovered. Reflecting this market roller coaster, the annualised volatility of daily returns on the S&P 500 index rose from 18% in 1999 to 27% in the first quarter of 2000, that on the DJ Euro STOXX from 20% to 26% and that on the Nikkei from 20% to 23%. This volatility set the stage for sharp market declines in May.

News about macroeconomic conditions was an important source of volatility. While the news during the first few months of 2000 suggested continued strength in the US and European economies, participants in stock markets seem to have become unusually sensitive to such information. Reactions to news also led to a divergence in performance between national markets. In Japan, the sell-off in March was triggered by GDP data which indicated that the economy had lapsed back into recession during the fourth quarter of 1999. Investors regarded evidence of strong growth in the United States as bad news for the market, whereas they saw similar evidence in Europe as good news. The unrelenting strength of US real activity created uncertainty over the extent of monetary tightening required to slow the economy. In one of the major market events of the period, the technology-heavy Nasdaq index fell 10% on 14 April upon the release of CPI inflation data and stocks in the index lost $1.4 trillion in total capitalisation (see the table below). Without any further significant news, the market rose again at the start of the following week. At other times, a court ruling in an antitrust case against Microsoft, questions about patents related to the Human Genome Project and disappointing earnings reports contributed to the volatility.

Within each economy's stock market, the technology sector tended to be more volatile than the non-technology sector. The annualised volatility of daily returns on the Nasdaq index rose from 27% in 1999 to 51% in the first quarter of 2000 and that on the European New Market index (EURO.NM) from 30% to 59%. In the US market, technology and non-technology stocks often played a tug of war, with one sector rising when the other fell. At any hint of a correction in "new economy" stocks, investors chose to return to "old economy" stocks rather than leave the market altogether. The result was a sharp drop in the correlation in returns between the two sectors. As many as half of the trading days in the first four months of 2000 saw the Dow Jones Industrial Average and the Nasdaq move in opposite directions, compared to about one third of the trading days in 1999. This tug of war, however, was largely a US phenomenon. There was little change in the correlation between returns on the DJ Euro STOXX and EURO.NM indices.

Order flows seemed to drive the prices of technology stocks to an extraordinary degree. Since macroeconomic data and companies' earnings reports tend to be announced outside trading hours, intraday price movements are often an indication of the effect of order flows, as orders can be

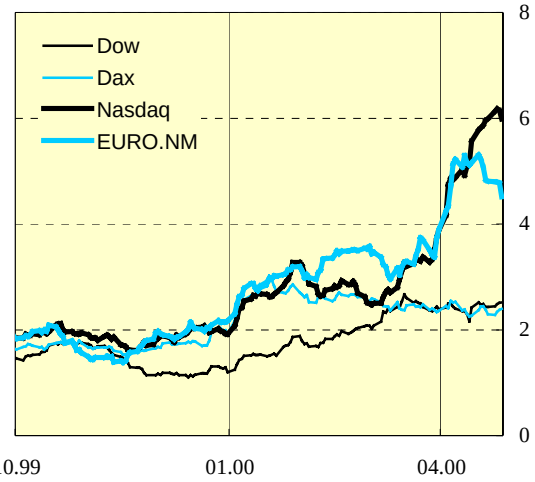
News events in stock markets

Date	One-day price change (in %)	Market index	News
7 January	+ 4.7	Dax	Strong earnings reported by Mannesmann and SAP
7 March	– 3.7	Dow Jones	Weak earnings reported by Proctor and Gamble
14 March	– 6.5	Nasdaq	Blair and Clinton prefer Human Genome Project to remain in the public domain
5 April	– 15.3	Nasdaq	Judge rules against Microsoft (intraday move)
14 April	– 9.7	Nasdaq	CPI inflation exceeds consensus forecast

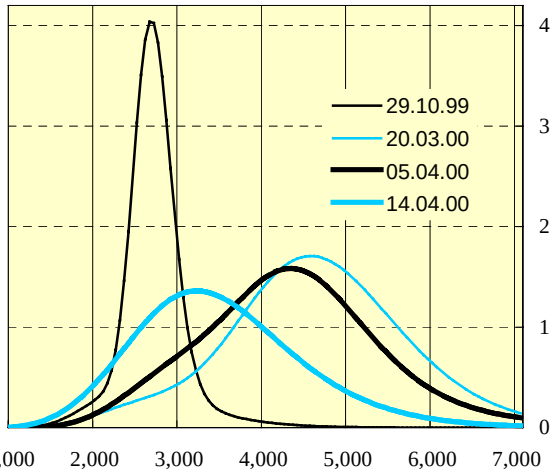
Source: Datastream.

Volatility of technology stocks

Intraday volatility (in %)[1]



Implied probabilities from Nasdaq options[2]



[1] Measured as the 20-day average of the high minus the low and divided by the closing price. [2] Calculated as the probability density function underlying all near-dated exchange-traded options.

Sources: Datastream; Chicago Mercantile Exchange; BIS calculations.

executed only during trading hours. When such flows are thought to be motivated by private information, their impact on the market can be quite pronounced. During the first few months of 2000, prices of technology stocks often swung wildly during the trading day (see the graph above). On 5 April, for example, the Nasdaq index fell by 15% during the day, only to recover most of its losses by the close. As measured by the difference between the day's high and low prices, the average intraday volatility of the Nasdaq Composite soared from 14% in 1999 to 36% in the first quarter of 2000, while that of the EURO.NM rose from 21% to 31%.

The recent susceptibility of technology stock prices to both public information and order flows appears to reflect new doubts about valuation assumptions, especially those applied to start-up companies with no actual earnings to report. These doubts were reflected in the prospective volatility priced into options and the fact that more established technology firms tended to maintain their market values better than new ones. The implied volatility in exchange-traded options on the Nasdaq index was relatively modest in October 1999, when technology share prices were rising, suggesting a degree of confidence about valuations (see the graph above). However, once these prices started to falter during 2000, prospective volatility became extraordinarily elevated. As of mid-March 2000, the implied distribution of possible future prices indicated a roughly one in four chance of at least a 20% decline, compared to a one in seven chance of such a decline in October 1999. At the same time, the correction this spring saw investors abandoning new subsectors such as business-to-business to move back into the stocks of technology companies with an established track record of earnings. Similar doubts may explain why the technology stocks in Japan and the United Kingdom, the sectors that had gained the most in 1999, lost the most in the early part of 2000.

The volatile market conditions since January led to a postponement of many high-profile initial public offerings (IPOs). In addition, the instability of stock prices frustrated merger agreements that relied on stock swaps. Despite this, the first quarter saw IPO proceeds in the United States more than three times higher than in the first quarter of any other year, in part because of the launch of a wireless telecommunications company by AT&T that alone raised a record $11 billion. Nevertheless, the volatility in April caused a variety of technology companies to postpone eagerly awaited issuance plans. Stock price volatility, however, has not been the only source of concern in the IPO market. Losses in the market have led investors to question the process of due diligence for listing start-up companies and to call for stricter standards of disclosure in the booming European markets.

The rise in volatility extended to the major currencies. Market participants wondered whether such exchange rate movements were driven by investor flows in stock markets. The annualised volatility of

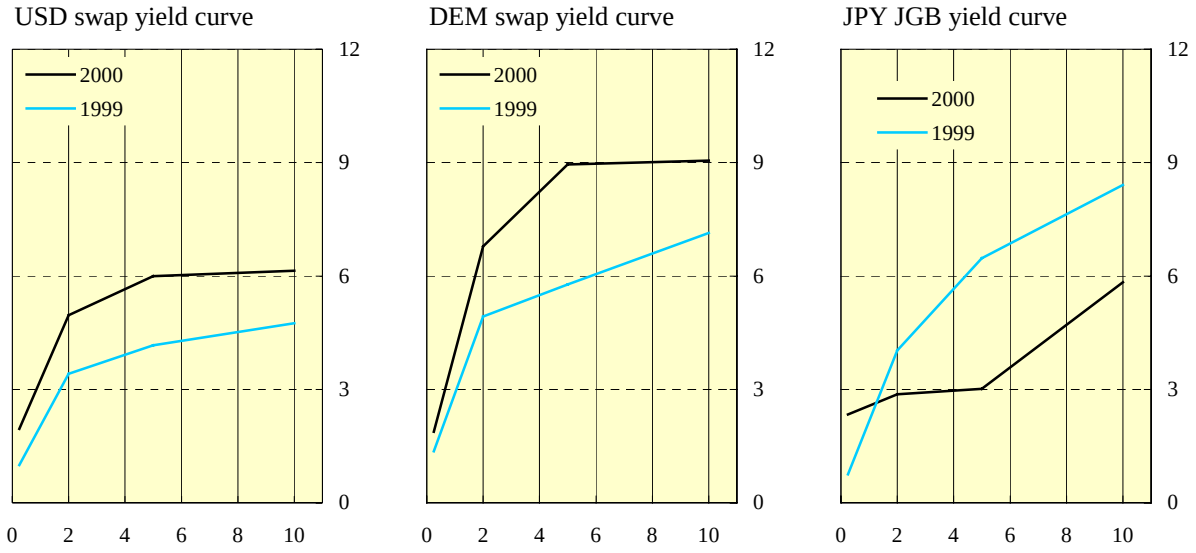
the euro against the dollar rose from 8.8% in the fourth quarter of 1999 to 10.7% in the first four months of 2000, while that of the yen against the dollar increased from 11.2% to 12.4%. In early 2000, however, investor interest in a particular currency from one day to the next did not seem to coincide with similar interest in the home stock market, particularly in the high technology sector. From January to April 2000, on days when the US dollar appreciated against the Japanese yen, for example, the Nasdaq index tended to lose ground to the Jasdaq index in Japan. Similarly, when the dollar gained on the euro, the EURO.NM index often outperformed the Nasdaq.

Bond markets confront liquidity problems and ambiguity about US agencies

Participants in bond markets became more preoccupied than usual with central bank watching. This preoccupation has often been reflected in yield curve movements around macroeconomic announcements, when market participants assess how the information will affect the likelihood and magnitude of policy rate changes over the coming months. The graph below shows that the reaction of US and European yield curves to major macroeconomic data tended to be stronger in the first few months of 2000 than in 1999.[1] However, the opposite was the case for Japanese yield curves. The US employment data released on 7 January, for example, revealed a growth of jobs in the US economy that exceeded analysts' predictions. In the US market, intermediate and long-term yields promptly increased. When European markets opened on 10 January, two- and 10-year yields also rose. In general, such strong reactions in the US bond market reflected new concerns about the degree of monetary tightening required to slow the US economy, while market reactions in the euro area echoed changing views about the weight the Eurosystem would place on maintaining the value of the euro. By

Yield curve announcement effects[1]

In basis points



[1] For Germany and Japan, average three-day change in yields on dates of major news announcements; for the United States, average one-day change. US announcements: employment, CPI, PPI; German announcements: IFO, CPI, unemployment; Japanese announcements: Tankan, CPI, trade. Data for 2000 are from 1 Jan to 30 April.

[1] The reaction in the United States is measured in terms of yields on interest rate swaps to abstract from liquidity factors affecting the Treasury market, as discussed below. The reaction in Europe is also measured in terms of swap yields to avoid the possibility of differential effects arising from the remaining fragmentation of the government bond markets in the euro zone.

News events in bond markets

Date	One-day yield change (in basis points)	Instrument	News
2 February	– 15	US 30-year Treasury	Gensler announces Treasury buybacks
13 April	+ 10	10-year JGB	BOJ announces it may raise interest rates later in 2000
4 January	+ 25	UK 10-year gilt	Purchasing managers' survey above expectations
4 April	– 10	US 5-year Treasury	US CPI inflation exceeds analysts' forecasts
25 April	+ 12	US 10-year Treasury	April consumer confidence remains stronger than expected

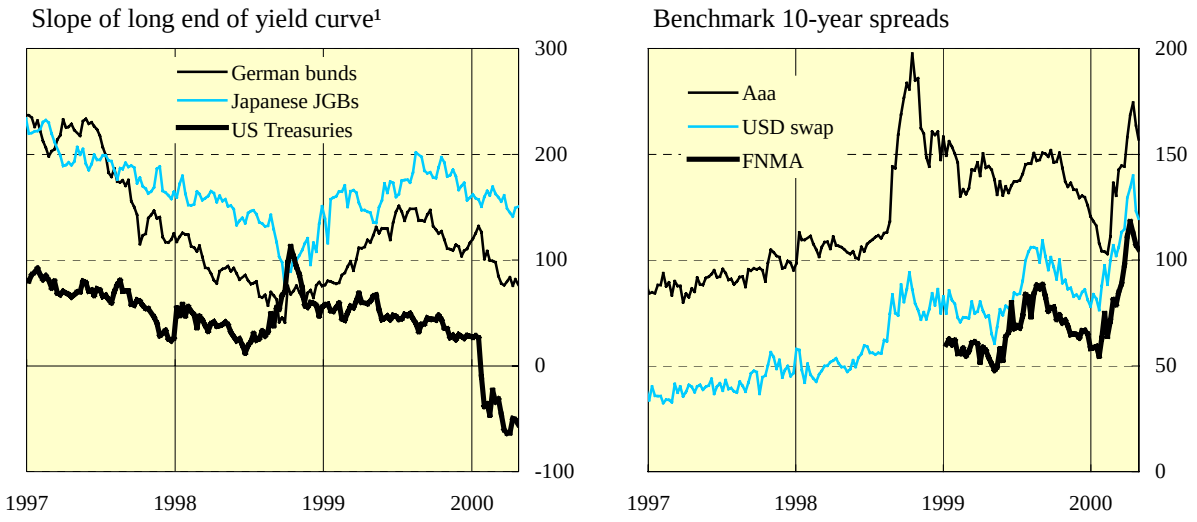
Sources: Bloomberg; Datastream.

contrast, new data in Japan tended to simply confirm the belief that a zero interest rate policy would be maintained for the immediate future.

Supply factors also became an increasingly important source of volatility in government bond markets. These factors made their presence felt in the inversion of the US Treasury yield curve (see the graph below). In the first week of February, a refunding announcement about the 30-year bond seemed to catch some market participants by surprise. The US Treasury announced that the amount to be auctioned the following week would be $5 billion less than anticipated and that there would be a further reduction at the August auction (see the table above). The 30-year yield fell 15 basis points on that day alone. Over the next few days, the differential between the 30-year yield and the two-year yield turned negative, going from 20 basis points to –40 basis points. In the past, such an inversion might have indicated market expectations of a slowing economy. There was no sign of such a slowdown this time, however. Instead, the inversion simply appeared to reflect the anticipated scarcity of the 30-year bond. The decline in this long yield also served to pull down US, European and Japanese 10-year yields. The inversion became even more pronounced in late March, when the credit

Yield curves and benchmark spreads

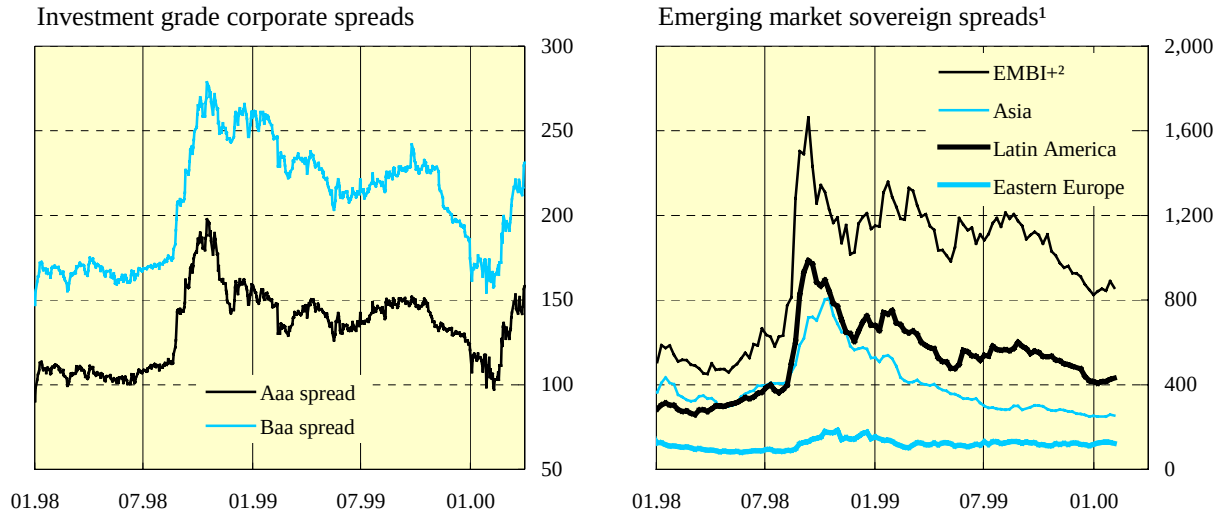
In basis points



¹ For Germany and Japan, 10-year yield less two-year yield; for the United States, 30-year yield less two-year yield.

Credit spreads

Over government benchmarks, in basis points



¹ Average of actively traded international bond spreads (one per country). ² Emerging Markets Bond Index.

Sources: Datastream; Bloomberg.

status of US agency bonds was called into question and investors seeking benchmark positions apparently shifted away from such bonds into long-term Treasury issues. During the first quarter, supply factors also reduced the yields on UK gilts. While the gilt auction calendar indicates a concentration of issuance in maturities longer than 15 years, market participants still see limited supply at the long end relative to demand from pensions and life assurance companies.

The ambiguity about the credit status of US government-sponsored enterprises remained unresolved in April. In recent years, housing credit agencies, such as the Federal National Mortgage Association ("Fannie Mae") and the Federal Home Loan Mortgage Corporation ("Freddie Mac"), had stepped up their bond issuance, offering several multi-billion dollar issues at key maturities in regular auctions in an effort to establish benchmarks. These agency issues enjoyed yields that were often lower than those on other triple-A issues (see the graph on page 6), apparently because investors assumed that they carried an implicit guarantee by the US government. On 24 March, an attempt by a US Treasury official to clarify the credit standing of these issues led to doubts about this guarantee. The resulting volatility in the agency market seems to have weakened the benchmark status of the bonds. To resolve the ambiguity over government backing for the agencies, a bill has been introduced in the US Congress to remove their lines of credit at the US Treasury, lift their exemption from state and local taxes and impose securities disclosure requirements on them. There is no certainty, however, that the bill will be passed.

Credit spreads in general widened sharply during the period (see the graph above). For investment grade issues, however, the widening can be attributed largely to the liquidity-induced decline in benchmark government yields. For 10-year triple-B issues, for example, the spread over the corresponding on-the-run Treasury yield rose 96 basis points between 27 January and 17 April, while the Treasury yield itself fell 68 basis points. More indicative of the price of credit risk, the spread of these triple-B issues over US swap yields widened by 54 basis points. The widening of spreads and their volatility confounded borrowers who traditionally rely on liquid government bonds for benchmarks, leading them to postpone their issuance plans.

While credit spreads on emerging market bonds also widened during the first few months of 2000, they remained well below the average of 1999. The most significant event in these markets was the upgrading of Mexican sovereign debt to investment grade by Moody's in March. Spreads on Mexico's eurobonds actually narrowed ahead of the announcement and then widened after the upgrade. By early April, however, credit spreads in general had risen sharply, with Mexican spreads over swaps

increasing by more than 45 basis points. Part of the widening in spreads coincided with the release of strong US inflation figures and large swings in the US stock market. Once April's market volatility had subsided, Mexico's sovereign spreads narrowed again to pre-upgrade levels.

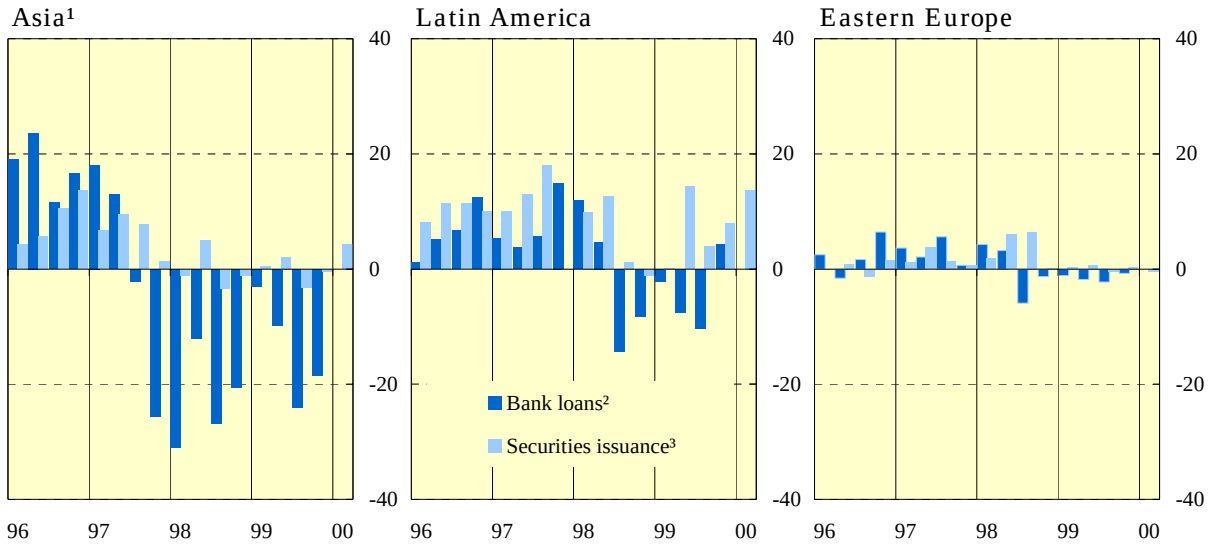
BIS data show roles of OTC derivatives and bank investment

Developments in the global OTC derivatives market shed light on the changing uses of government bonds and interest rate swaps. One of the notable features of the BIS semiannual statistics on this market for end-December 1999 was a lack of growth in the notional amounts of US dollar swaps. The data show such interest rate contracts in various currencies leading an acceleration of growth in the market as a whole (see Section 3 of Part II). However, this growth was concentrated in euro and yen contracts, while activity in dollar contracts was subdued. The relative weakness of activity in the latter is significant because it took place at a time of an apparent increase in the use of such swaps for taking positions on US interest rate movements or for hedging against them. The lack of growth in notional amounts suggests that this use of swaps was offset by a slowing of arbitrage activity between those contracts and US Treasury securities. In the euro area and Japan, similar arbitrage activity had not been that strong in the first place, and the growth in swaps activity may have reflected a wider use of the contracts for hedging and positioning as well as arbitrage.

International banks contributed to the easing of credit spreads during 1999. The most recent data on cross-border transactions reported to the BIS show that these banks invested heavily in debt securities throughout the year, purchasing roughly $77 billion in the fourth quarter alone (see Section 1 of Part II). The bulk of these purchases were accounted for by European banks. At the same time, banks resumed their traditional international lending activity to non-bank borrowers in developed countries. In the fourth quarter, such lending net of repayments amounted to $24 billion. However, the largest loans were those that provided bridge financing for merger and acquisition deals, many of which would be refinanced with securities issuance. As regards emerging markets, borrowers in Latin America exhibited a preference for securities financing over bank loans, while those in Asia simply

International bank and securities financing by region

In billions of US dollars



[1] Excluding Hong Kong, Japan and Singapore. [2] Exchange rate adjusted changes in BIS reporting banks' loans to Asian, Latin American and eastern European countries. Data on bank borrowing are not yet available for the first quarter of 2000. [3] Net issues of international money market instruments, bonds and notes.

Sources: Bank of England; Capital DATA; Euroclear; ISMA; Thomson Financial Securities Data; national data; BIS.

continued to repay their loans (see the graph on the previous page). Had the banks themselves not accommodated this shift from loans to securities with their own investments, credit spreads could not have narrowed as much as they did.

The volatility and rise in credit spreads in early 2000 altered the issuance plans of some but not all borrowers. BIS data on international debt securities for the first quarter show that net issuance of fixed rate issues recovered after an unusually slow fourth quarter but remained weaker than in the first quarter of 1999. In their determination to establish benchmarks, US agencies were evidently unfazed by spreads during the latest quarter and issued record amounts of multi-billion dollar securities that carried the highest credit ratings. At the same time, net issuance by private sector borrowers in emerging markets turned positive for the first time since autumn 1998. Borrowers from Brazil and Mexico led such issuance, the sharp decline in their borrowing spreads since autumn 1998 apparently more than compensating for higher volatility in 2000. Hence, the international borrowers most affected by the changes in spreads tended to be those in the middle of the credit spectrum, that is, those with investment grade ratings below triple-A.

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II. Highlights of international financing

1. The international banking market

International banks continued to invest heavily in international debt securities in the fourth quarter of 1999, although they resumed lending to non-banks as well. While retrenchment from offshore centres also came to an end with a build-up of interbank positions in the Caribbean, interbank lending between developed countries slowed, following a surge in the previous quarter (see the table below). These developments were reflected in a pickup of dollar and yen positions, while euro positions declined slightly for the first time. Emerging market borrowers in Latin America continued to show a preference for securities financing over bank credit and those in Asia continued to repay their loans. End-year data from the BIS consolidated statistics indicate that most emerging market borrowers continued to lengthen the average maturity of their borrowing.

Main features of cross-border claims of BIS reporting banks[1]

In billions of US dollars

	1998	1999	1998	1999				Stocks at end-Dec 1999
	Year	Year	Q4	Q1	Q2	Q3	Q4	
Claims on developed countries	**567.3**	**449.9**	**61.2**	**94.2**	**56.8**	**193.9**	**105.0**	**7,562.9**
of which: intra-euro 11	*295.4*	*256.2*	*103.2*	*133.2*	*37.9*	*82.5*	*2.5*	*1,505.1*
Interbank loans	288.7	29.9	– 16.6	– 15.4	– 82.2	123.5	4.1	4,416.7
Loans to non-banks	24.2	103.4	14.1	6.9	66.8	5.4	24.3	1,319.0
Securities[2]	254.4	316.6	63.8	102.8	72.3	65.0	76.6	1,827.3
Claims on offshore centres	**– 178.0**	**– 105.6**	**– 72.5**	**– 68.9**	**– 45.0**	**– 26.4**	**34.7**	**1,207.9**
Interbank loans	– 172.0	– 139.3	– 24.2	– 77.0	– 51.8	– 47.7	37.2	858.4
Loans to non-banks	– 27.1	6.3	– 50.5	2.1	0.9	12.7	– 9.3	224.8
Securities[2]	21.0	27.4	2.2	6.1	5.9	8.6	6.7	124.7
Claims on developing countries[3]	**– 83.0**	**– 71.2**	**– 25.6**	**– 9.4**	**– 20.7**	**– 34.6**	**– 6.5**	**857.1**
Interbank loans	– 63.9	– 61.6	– 8.5	– 11.3	– 19.7	– 22.3	– 8.3	340.5
Loans to non-banks	– 12.4	– 14.6	– 12.2	2.4	– 3.6	– 12.4	– 1.0	389.9
Securities[2]	– 6.8	4.9	– 4.9	– 0.5	2.6	0.1	2.8	126.8
Unallocated	**– 33.9**	**– 20.0**	**– 10.2**	**– 3.0**	**– 0.3**	**– 13.4**	**– 3.3**	**195.6**
Total	**272.4**	**253.1**	**– 47.1**	**13.0**	**– 9.2**	**119.5**	**129.9**	**9,823.5**
Interbank loans	28.1	– 219.9	– 55.4	– 111.2	– 153.5	34.7	10.1	5,684.0
Loans to non-banks	– 26.9	92.2	– 58.8	– 0.7	61.5	5.0	26.4	1,966.8
Securities[2]	271.2	380.7	67.1	124.9	82.7	79.8	93.4	2,172.7
Memorandum item:								
Syndicated credits[4]	*902.0*	*957.1*	*219.8*	*172.5*	*271.1*	*264.3*	*249.2*	

[1] Changes in amounts outstanding excluding exchange rate valuation effects. [2] Partly estimated. The data include other assets, which account for less than 5% of the total claims outstanding. [3] Including eastern European countries. [4] Announced new facilities.

Securities financing continues to outpace loans to developed countries

Banks' net purchases of cross-border securities remained buoyant, with the bulk of the $77 billion uptake in the fourth quarter of 1999 comprising purchases of European securities by European banks ($48 billion). For the year as a whole, reporting banks overwhelmingly purchased European securities ($296 billion) and modest amounts of securities issued by US residents ($23 billion) while selling those issued in Japan (-$30 billion).

By contrast, cross-border *interbank* loans in developed countries slowed towards year-end, making the surge in the third quarter even more exceptional. This was partly related to unusually large repayments from emerging markets and non-bank borrowers in the United States, which resulted in a temporary expansion of interbank balance sheets as banks passed these funds around in a portfolio adjustment process. In addition, there may have been a build-up of liquid positions ahead of the changeover to 2000. As in the international securities markets, this precautionary activity appears to have been completed during the third quarter, with national monetary authorities standing by to supply additional liquidity in domestic currency at year-end if necessary.

Following a very quiet third quarter, net loans to *non-banks* in developed countries picked up again in the fourth quarter, partly due to strong loan demand in the United States. The $24 billion net increase was more than accounted for by lending to US residents ($34 billion), mainly by banks in Japan. Meanwhile, non-bank borrowers in Europe repaid $14 billion, half of which came from borrowers in Germany.

Interbank transactions with offshore centres surge

The fourth quarter rise in claims vis-à-vis the Cayman Islands ($45 billion) was largely the result of a surge in interbank loans ($38 billion). Commercial banks in the United States and the United Kingdom placed funds with own affiliates there, while Japanese banks appear to have used branches in the Cayman Islands in a bid to restructure their balance sheets. Japanese banks had set up special purpose vehicles (SPVs) in the Caribbean centre to reduce their assets and thus improve their capital adequacy ratios. The loans were sold to the SPVs, which issued commercial paper collateralised by these loans. The commercial paper was then purchased by other Japanese banks.

Fourth quarter data suggest that the reversal of the round-tripping of funds from Japan through Asian offshore centres may have slowed. Bank claims on Singapore rose at year-end ($3.3 billion), while those on Hong Kong fell only marginally ($0.7 billion). Commercial banks' total claims on offshore centres had fallen by $108 billion in 1999, following a $173 billion decline the previous year. Hong Kong and Singapore had more than accounted for the retreat, as both centres were affected by Japan's withdrawal from the offshore yen market.

The latest *consolidated international banking statistics* confirm the prevalence of foreign branch activity in offshore centres. Data on net transfers to ultimate risk, which allow a restatement of international claims for implicit and explicit guarantees, indicate that BIS reporting banks' exposures to offshore centres were in fact 25% lower than indicated by total consolidated claims on these centres.[2]

Emerging markets continue to repay

Emerging market borrowers continued to shun international banks in the fourth quarter as they had for most of the year. Borrowers repaid $71 billion in total claims during the year, with the bulk of

[2] For more detail on ultimate risk statistics, refer to the press release on the BIS consolidated international banking statistics published on 12 May 2000 (www.bis.org/publ). For an explanation of the differences between the BIS locational and consolidated banking statistics, see the box on page 16 entitled "A tale of two statistics: the BIS locational and consolidated international banking statistics".

Syndicated credits in the first quarter of 2000

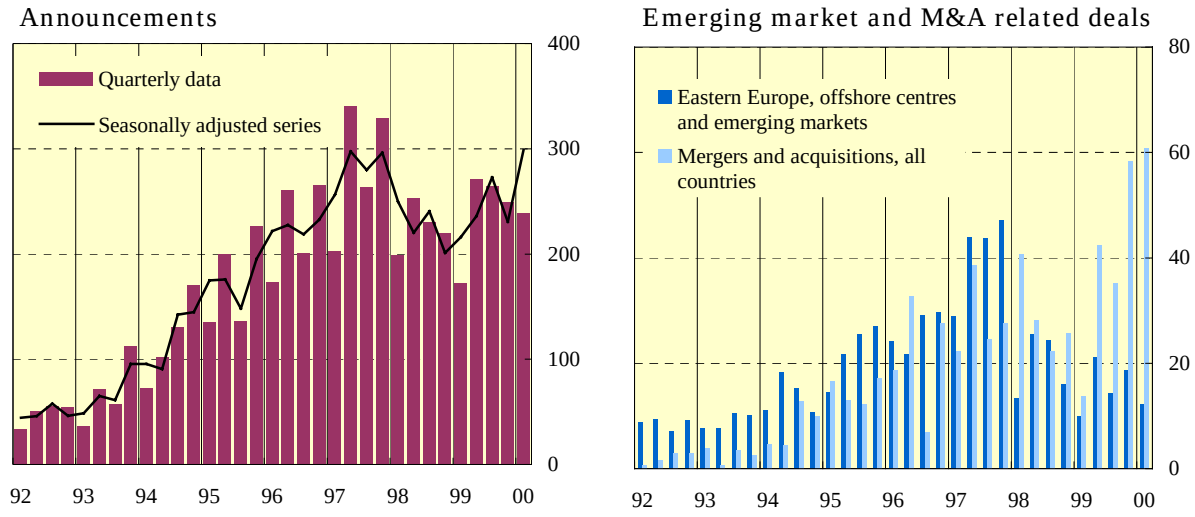
Blaise Gadanecz

International syndicated credit facilities amounted to $239 billion, a 4% decline from the previous quarter. However, the first quarter is traditionally a calm one; on a seasonally adjusted basis, there was a 30% increase in announcements.

Takeover activity was strong in western Europe and this was accompanied by a record $61 billion of merger and acquisition-related international syndicated credit facilities. The two largest deals were both in the telecommunications sector: a €13 billion facility to support the acquisition by the Netherlands' KPN of E-Plus, Germany's third largest wireless carrier, and a €30 billion facility to finance the takeover of Germany's Mannesmann AG by the United Kingdom's Vodafone Airtouch. The Vodafone deal represented the largest ever syndicated loan put in place, supporting the largest hostile takeover bid (€124 billion) in corporate history. The recent spate of European takeovers has reinforced the use of the euro for international syndicated credits at the dollar's expense. While 4% of total deals were denominated in euro area currencies and 85% in US dollars in the second quarter of 1998, the relative use of the US dollar has been following a downward trend since then, falling to 59% in the first quarter of 2000, against 23% for the euro. Syndicated lending to non-industrialised countries remained weak at $12 billion.

Announced facilities in the international syndicated credit market

In billions of US dollars



Sources: Capital DATA; BIS.

repayments occurring in the second and third quarters (see the table on the next page). Recent figures for the fourth quarter highlight increasingly divergent trends across regions. BIS reporting banks continued to receive heavy net repayments from Asia, while resuming lending to Latin America, particularly to Brazil. Major borrowers in eastern Europe such as Hungary and Poland had ready access to bank funds but Russian banks remained shut out of international credit markets.

Data for the fourth quarter of the year show that Korea, China and Thailand accounted for the bulk of the $17 billion decline in bank claims vis-à-vis *Asia*. Korean non-banks stepped up their repayments at year-end, mainly to their US and Japanese bank creditors. Asian borrowers repaid a total of $53 billion to international banks in 1999, with an acceleration in repayments of interbank loans. Cumulative current account surpluses and a reflow of direct and foreign portfolio investment to these countries have largely obviated the need for bank borrowing.

A breakdown of bank claims on Asia by maturity (available from the BIS consolidated banking statistics) suggests that repayments of short-term debt coming due have lengthened the maturity profile of external claims on the region. The proportion of China's long-term bank debt (claims over one year) to total debt outstanding rose from 40% in mid-1998 to 55% at end-1999, while that for

Banks' claims on transition and developing countries[1]

In billions of US dollars

	1998	1999	1998	1999				Stocks at end-Dec 1999
	Year	Year	Q4	Q1	Q2	Q3	Q4	
Total claims	**– 83.0**	**– 71.2**	**– 25.6**	**– 9.4**	**– 20.7**	**– 34.6**	**– 6.5**	**857.1**
Eastern Europe	0.0	– 4.1	– 0.5	– 1.9	– 1.8	– 0.9	0.5	99.3
Russia	– 6.1	– 8.1	– 1.7	– 3.6	– 1.5	– 1.7	– 1.4	43.7
Africa	– 1.5	0.3	– 0.4	2.0	– 0.2	– 0.9	– 0.6	55.9
Asia	– 96.4	– 52.7	– 22.4	– 3.1	– 8.1	– 24.5	– 17.0	315.1
China	– 10.6	– 15.1	– 2.1	– 1.8	– 0.4	– 7.3	– 5.5	67.5
Indonesia	– 14.1	– 6.3	– 3.8	0.8	– 2.1	– 3.7	– 1.3	46.4
Korea	– 32.9	– 5.1	– 7.5	2.0	– 0.1	– 1.3	– 5.7	70.0
Malaysia	– 6.6	– 4.0	– 1.6	– 0.2	– 0.8	– 1.5	– 1.5	20.2
Philippines	– 0.8	– 0.5	1.2	0.0	1.0	– 1.8	1.2	17.1
Thailand	– 28.9	– 16.4	– 8.7	– 5.3	– 2.7	– 5.8	– 2.7	36.4
Latin America	– 8.4	– 16.3	– 12.2	– 2.4	– 7.1	– 11.1	4.4	280.4
Argentina	0.7	0.5	– 2.2	1.5	0.0	– 2.0	1.0	48.2
Brazil	– 10.6	– 8.9	– 8.4	– 6.1	– 3.2	– 3.4	3.8	85.4
Mexico	0.3	– 4.2	– 0.2	0.0	– 1.5	– 1.7	– 1.1	61.0
Middle East	23.3	1.5	9.8	– 3.9	– 3.5	2.8	6.2	106.5

[1] Changes in amounts outstanding excluding exchange rate valuation effects.

Thailand climbed from 37% to 44%. Notable exceptions were Korea and India, with the former in particular experiencing a sharp increase in the share of short-term debt. However, as claims are allocated on the basis of remaining maturities, this can be mostly attributed to claims that were originally long-term becoming short-term, rather than a resumption of short-term borrowing.

International bank claims on Latin America rose in the fourth quarter ($4.4 billion) for the first time since the sharp contraction following the Russian currency crisis. Despite the decline in commercial banks' claims on the region for the first three quarters of the year, Latin American countries were not excluded from international capital markets. On the contrary, the region was able to raise $26 billion in international fixed income securities in 1999, taking advantage of a narrowing of credit spreads during the year (see Section 2 of Part II). This would suggest a tendency to rely less on bank lending and more on securities markets for financing needs. Nonetheless, the fourth quarter saw a reflow of bank credit to Brazil ($3.8 billion) for the first time since the second quarter of 1998. Argentina also attracted increased bank funds ($1 billion), mainly in the form of securities purchases. Meanwhile, Mexico continued to make net repayments, 63% of which involved interbank loans.During the second half of the year, detailed data from the consolidated statistics indicate that Latin American borrowers lengthened the average maturity of their debt even as the size of this debt fell. While the locational data show a rise in claims on the region in the fourth quarter, the half-year decline in consolidated exposures is consistent with the locational data measured over the same period (see the table above). A rise in long-term debt was more than offset by large repayments of short-term borrowing. Additional detail on the instrument breakdown of claims to the region from the locational statistics implies that the main short-term repayments were for loans.

The large deposits placed with BIS reporting banks from the *Middle East* in the fourth quarter ($16.6 billion) came mainly from oil-exporting countries.[3] Given the correlation between deposit flows from Middle East oil exporters and the price of oil, a further price rise suggests that deposits from the region may continue to build up.

[3] The United States classifies its assets and liabilities vis-à-vis Middle East oil exporters as "residual Middle East", without providing separate country detail.

In the period under review there were modest increases in net claims on *eastern Europe* for the first time since Russia's currency devaluation, with increased holdings of international securities offset by a decline in bank loans. International financing to eastern Europe during the year was characterised by regional market differentiation. Banks extended credit to Poland ($3.4 billion)[4] and purchased Hungarian securities ($1.1 billion), while continuing to withdraw from Russia (–$8.1 billion). Indeed, bank loans to Poland rose in 1999 amid signs of increasing macroeconomic strains. Notwithstanding the overall drop in claims on Russia, there was evidence of a resumption of lending to the Russian non-bank sector in the latter half of the year. In particular, figures for the fourth quarter show a rise in purchases of Russian non-bank securities ($0.4 billion), mainly by banks in Germany.

The latest figures from the BIS consolidated statistics suggest a general lengthening in the average maturity of debt for Hungary and Poland. European banks now account for a record 84% of exposure to eastern Europe, with German banks holding 43% of outstanding claims on the region.

Lending shifts from euros to dollars and yen

Data on the currency composition of lending flows in the fourth quarter of 1999 show a sharp shift in international lending from euros to US dollars and yen (see the table below). The data cover banks' foreign currency positions with residents as well as cross-border positions that involve a foreign currency for either lender or borrower. Hence, the reported flows exclude transactions in euros between countries within the euro area (these intra-euro 11 transactions are instead shown as a memorandum item). Lending in dollars surged to $98 billion during the quarter, continuing a recovery in dollar business that began in the second quarter. This business had previously been in decline because of the currency's shrinking role in the interbank market. Lending in yen rose to $32 billion after an extended period of repayments associated with international retrenchment by Japanese banks. By contrast, lending in euros turned negative for the first time in the new currency's existence.

Composition of foreign currency bank lending[1]

In billions of US dollars

	1997	1998	1999					Stocks at end-Dec 1999
	Year	Year	Year	Q1	Q2	Q3	Q4	
US dollar	648.7	84.9	27.0	–114.7	17.2	26.8	97.7	4,491.9
Euro[2]	178.8	99.5	228.1	153.1	9.4	89.7	– 24.1	1,644.3
Japanese yen	182.8	– 38.1	–213.6	–146.5	– 74.7	– 24.5	32.1	952.5
Pound sterling	89.3	49.4	16.5	23.7	1.0	5.5	– 13.7	464.5
Swiss franc	33.1	23.5	38.0	22.5	0.0	15.1	0.3	321.2
Other and unallocated	105.3	–153.6	– 54.0	..	– 3.4	– 52.0	1.4	1,869.8
Total	**1,238.0**	**65.6**	**3.7**	**–100.1**	**– 50.5**	**60.6**	**93.7**	**9, 744.2**
Memorandum item: Cross-border domestic currency intra-euro 11 positions	*95.8*	*196.8*	*288.9*	*142.2*	*51.1*	*86.1*	*9.5*	*1,233.1*

[1] Changes in amounts outstanding excluding exchange rate valuation effects. [2] For 1997 and 1998, data relate to five euro legacy currencies (BEF, DEM, FRF, ITL and NLG) and the ECU, which were reported separately. Changes for 1999 Q1 are adjusted on an estimated basis to exclude the shift from "Other and unallocated" to "Euro area currencies" of data for six euro legacy currencies which were previously not reported separately under foreign currency positions (ATS, ESP, FIM, IEP, LUF and PTE).

[4] Total claims on Poland for 1999 exclude a $1 billion equity investment in a Polish bank by another European bank.

Lending flows within the euro area illustrate the dramatic effects of eliminating currency risk. The memorandum item on cross-border intra-euro area positions shows that lending in the 11 domestic currencies within the area doubled between 1997 and 1998, with bank and non-bank borrowers anticipating the changeover to a single currency. These positions surged by a further 47% in 1999 after the introduction of the euro. Flows were mainly in the form of lending between banks themselves in the euro area. By the fourth quarter, this adjustment to the new currency appears to have run its course.

A tale of two statistics: the BIS locational and consolidated international banking statistics

Melissa Fiorelli

The BIS collects and disseminates two different sets of international banking data, both based on information provided by creditor banks. The first set of data, originally introduced in 1964 to monitor the development of eurocurrency markets, is known as the *locational* statistics (Annex Tables 1-8). The second set, the *consolidated* statistics, was launched in 1977 and subsequently expanded following the onset of the Mexican debt crisis in 1982 (Annex Table 9). Once differences in reporting regimes are taken into account, the two sets of data can be used to complement each other in economic analysis.

The locational reporting system collects quarterly data on the gross international financial claims and liabilities of banks resident in a given country. The main purpose of the statistics is to provide information on the role of banks and financial centres in the intermediation of international capital flows. The reporting system is currently comprised of 24 participating countries, namely 18 industrial and six offshore financial centres.[①] The key organisational criteria are the country of residence of the reporting banks and their counterparts as well as the recording of all positions on a gross basis (including those vis-à-vis own affiliates), consistent with the principles underlying the compilation of national accounts, balance of payments and external debt statistics. The currency breakdown allows the approximate calculation of capital flows that take account of exchange rate movements.

The consolidated banking statistics report banks' international financial claims vis-à-vis the rest of the world and provide a measure of the country risk exposure of national banking systems. The data mainly cover claims reported by bank head offices, including the exposures of their foreign affiliates, and are on a worldwide consolidated basis with inter-office accounts being netted out. These statistics provide information on exposures to the country of the immediate borrower and on the reallocation of claims (ie risk transfers) to the country of ultimate risk. The latter is defined as the country where the guarantor of a claim resides. These data are currently collected on a semiannual basis and reported by 18 industrial countries. The consolidated statistics will soon be reported on a quarterly basis, beginning with the data for March 2000.

Because more countries contribute to the locational bank lending data, one would expect the measure of outstanding debt as reported by the locational data to exceed that of the consolidated data. However, the reporting of worldwide positions in the consolidated data tends to compensate for this. While the locational statistics are appropriate for measuring lending flows in a given period, the consolidated statistics are more suited to gauging the size of bank exposures. They also provide additional details, notably on maturity, which can be used to supplement the locational data.

BIS international banking statistics	Locational	Consolidated
Creditor reporting basis	Residence (host country)	Nationality (home country)
Number of reporting countries	24 (18 industrial and six offshore)	18 industrial
Reported data	External claims and liabilities	Worldwide consolidated claims
Inter-office netting-out	No	Yes
Type of counterparty	Immediate borrower	Immediate and ultimate borrower
Composition of claims by:		
Currency	Yes	No
Type of instrument	Yes (loans, deposits, securities)	No
Sector	Yes (bank, non-banks)	Yes (banks, non-banks, public)
Country of borrower	Yes	Yes
Maturity	No	Yes

① The following industrial countries file reports for the BIS locational and consolidated banking statistics: Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Luxembourg, the Netherlands, Norway, Spain, Sweden, Switzerland, the United Kingdom and the United States. The following offshore financial centres file reports for the BIS locational statistics only: the Bahamas, Bahrain, the Cayman Islands, Hong Kong, the Netherlands Antilles and Singapore.

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2. The international debt securities market

After a slowdown in the final months of 1999, net issuance of international debt securities enjoyed a modest recovery in the first quarter of 2000 and was on track to approach the record levels reached during 1999 as a whole (see the table below). Total net issuance rose to $266 billion from $212 billion in the final quarter of 1999, when activity had been dampened by concerns about possible market disruptions related to the millennium changeover. Compared with the first quarter of 1999, however, total net issuance in the first quarter of 2000 was down by 14%. Virtually all of this decline resulted from lower net issuance of money market securities; net issuance of international bonds and notes in the first quarter was roughly unchanged from a year ago. Securities issuance was dominated by financial institutions and state agencies rather than non-financial corporations, and by fixed rate rather than floating rate or equity-linked structures. Both the preference for long-term, fixed rate securities

Main features of net issuance in international debt securities markets[1]

In billions of US dollars

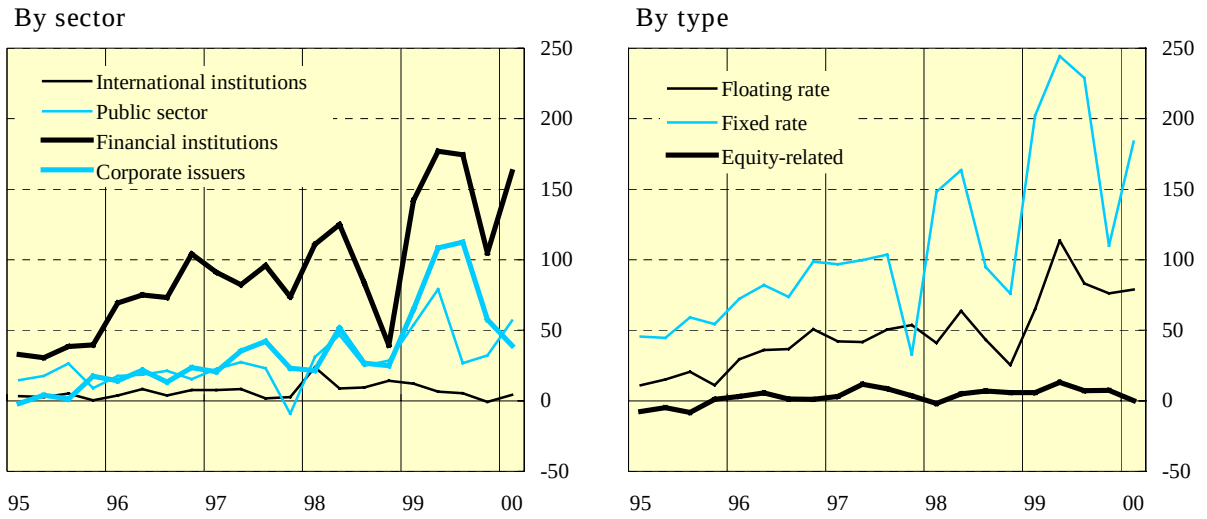
	1998	1999	1999				2000	Stocks at end-March 2000
	Year	Year	Q1	Q2	Q3	Q4	Q1	
Total net issues	**681.5**	**1,225.2**	**307.8**	**363.1**	**342.0**	**212.2**	**266.0**	**5,580.0**
Money market instruments[2]	9.8	68.6	35.1	– 8.0	22.8	18.7	3.4	263.0
Bonds and notes[2]	671.1	1,156.5	272.7	371.1	319.2	193.5	262.7	5,317.0
Developed countries	575.3	1,149.3	284.2	333.9	331.3	199.9	241.1	4,701.1
Euro area	*211.0*	*493.9*	*116.2*	*143.7*	*137.4*	*96.5*	*119.8*	*1,840.6*
Japan	*– 17.4*	*4.1*	*0.0*	*2.4*	*7.0*	*– 5.3*	*– 13.2*	*322.3*
United States	*280.4*	*484.5*	*129.8*	*141.1*	*131.5*	*82.1*	*88.1*	*1,394.5*
Offshore centres	10.0	15.7	7.4	0.9	3.0	4.5	0.7	75.3
Other countries	40.2	35.5	2.6	21.7	2.0	9.1	20.0	425.8
International institutions	56.0	24.7	13.6	6.7	5.7	– 1.3	4.2	377.8
US dollar	410.4	546.2	157.2	172.2	142.1	74.7	122.1	2,634.2
Yen	– 26.8	– 5.8	– 11.9	– 1.8	8.1	– 0.2	– 1.2	531.6
Euro area currencies	224.2	576.0	138.5	152.5	164.8	120.3	121.4	1,650.5
Other currencies	73.6	108.8	24.1	40.2	27.1	17.4	23.8	763.7
Private sector	503.2	1,011.6	242.2	278.5	310.1	180.9	201.0	4,094.4
Financial institutions[3]	*370.0*	*658.9*	*171.7*	*168.3*	*196.3*	*122.5*	*162.4*	*2,717.1*
Corporate issuers	*133.2*	*352.7*	*70.4*	*110.1*	*113.8*	*58.3*	*38.6*	*1,377.4*
Public sector[4]	122.3	188.8	52.1	78.0	26.2	32.6	60.8	1,107.8
Central government	*35.6*	*37.6*	*7.2*	*21.9*	*– 2.9*	*11.5*	*15.6*	*483.8*
State agencies and other	*86.7*	*151.2*	*44.9*	*56.1*	*29.2*	*21.1*	*45.3*	*624.0*

[1] Flow data for international bonds, money market instruments and notes. Changes in amounts outstanding excluding exchange rate valuation effects. [2] Excluding notes issued by non-residents in the domestic market. [3] Commercial banks and other financial institutions. [4] Excluding international institutions.

Sources: Bank of England; Capital DATA; Euroclear; ISMA; Thomson Financial Securities Data; BIS.

Net issues of international bonds and notes by sector and type

In billions of US dollars



Sources: Bank of England; Capital DATA; Euroclear; ISMA; Thomson Financial Securities Data; BIS.

and the slowdown in corporate issuance appeared to reflect an uncertain environment for interest rates and credit spreads during the quarter (see page 7 of the Overview for a detailed discussion). Despite this uncertainty, structural aspects of the market continued to evolve, as illustrated by the advent of online underwriting of international bonds (see the box on page 21).

Activity by banks and housing agencies offsets the slowdown in corporate issuance

Commercial banks and other financial institutions were once again, and by far, the most active issuers of international bonds and notes in the first quarter of 2000, with 62% of net issuance (see the graph above). Fund-raising by this group of issuers has proceeded at a particularly strong pace in recent years, generally accounting for more than 50% of aggregate net financing activity in international securities markets. German and US financial institutions have been the busiest issuers, and at the end of March accounted for 24% and 23% respectively of outstanding securities launched by such entities. German state banks have been particularly active, capitalising on their high credit ratings to obtain wholesale financing. While such high ratings are in part the result of various forms of state support, German banks have also benefited from the financial strength of mortgage-backed structures (Pfandbriefe in particular). In contrast, the bulk of issues by US financial institutions have been launched by non-banks. Securitisation vehicles have accounted for about one third of activity by such entities, with the rest coming from securities firms and insurance companies.

Announced issues of international bonds and notes by US state agencies rose to record levels in the first quarter of 2000. Repayments were exceptionally strong, but net issuance was still nearly twice as high as during the final quarter of 1999. The US housing credit agencies, most notably Freddie Mac and Fannie Mae, offered several multi-billion dollar issues at key maturities in an attempt to create alternative US dollar benchmarks to US Treasuries. Both of these agencies have expanded their balance sheets considerably in recent years. The international portion of their debt has grown particularly quickly as the two agencies have pursued a strategy of funding diversification.

The return of emerging market borrowers to international markets continues

Net issuance by emerging economies continued to expand in the first quarter of 2000, rising to $20 billion from $9 billion in the final quarter of 1999. Central governments remained the most active borrowers in international markets, though after two quarters of net repayments net issuance by private sector borrowers also turned positive. Improving credit fundamentals, such as robust growth in Asia

and Latin America, lay behind the increase in securities flows to emerging markets. Ongoing structural reforms also helped boost investor confidence.

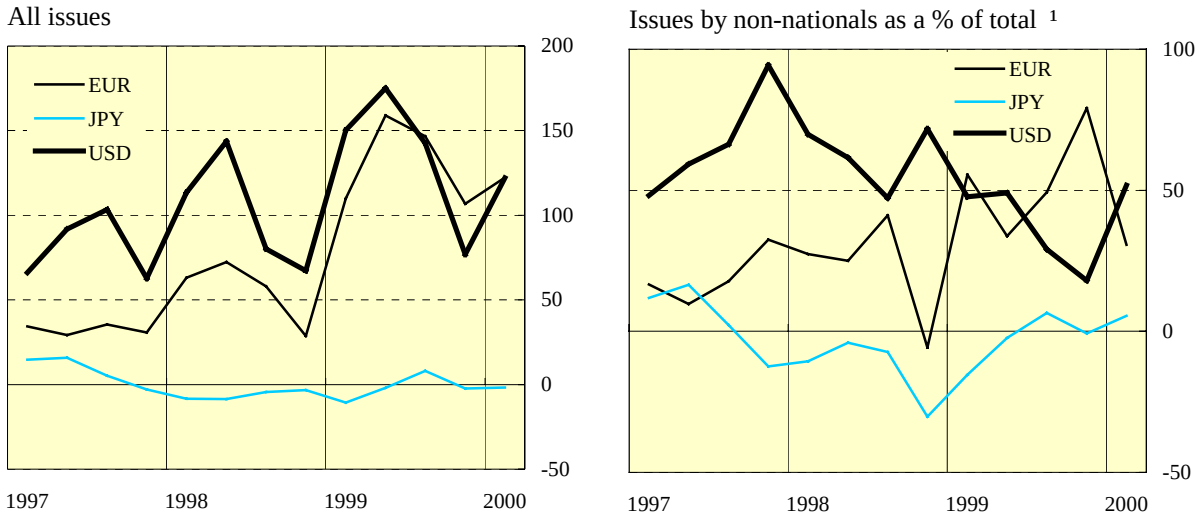
Latin American issuers were especially active, raising $16 billion. Net issuance by public sector borrowers rose to record levels, with the Argentine and Brazilian governments raising $3.9 billion and $3.4 billion respectively. Private sector issuance, which had been relatively subdued since autumn 1998, also picked up in the first quarter, led by Brazilian and Mexican borrowers. As Latin America rebounded from its 1998-99 slowdown, widening current account deficits - which remained large even last year - supported demand for increased foreign funding. Recent upgrades of Mexico's credit rating, most notably Moody's decision to give the country an investment grade (Baa3) rating, are also expected to support inflows.

Another noteworthy development in the first quarter of 2000 was Asia's return to international debt markets. Repayments by Asian borrowers (excluding Japan) had exceeded new issues by $3.2 billion in 1999 as a whole, but in the first quarter a marked increase in private sector issuance caused the situation to reverse. Flows to Korean financial institutions rose to their highest level since the Asian crisis, indicating growing confidence in the financial sector reforms undertaken to date in that country. Among public sector borrowers, new issues by the Philippine government were more than offset by repayments by other sovereign issuers, most notably Korean agencies.

Issuance by eastern European borrowers remained relatively subdued, despite a gradual narrowing of credit spreads. Countries preparing for accession to the European Union, such as Poland and Hungary, met most of their external financing needs through foreign direct investment. Countries less advanced in the transition process have had irregular access to international debt securities markets. Ukraine defaulted on bond payments due in the first quarter of 2000, but made up the payments after successfully exchanging securities maturing in 2000-01 for bonds with a longer maturity. Russia reached an agreement in principle with its London Club creditors in February, which is expected to set the stage for Russia's return to bond markets in time to refinance a $1 billion eurobond falling due in November next year.

Net issues of international bonds and notes by currency

Quarterly totals, in billions of US dollars



[1] Share of non-US borrowers in US dollar issuance, non-euro zone borrowers in euro issuance and non-Japanese issuers in yen issuance.

Sources: Bank of England; Capital DATA; Euroclear; ISMA; Thompson Financial Services; BIS.

The dollar outpaces the euro

The rebound of net issuance in the first quarter of 2000 relative to the fourth quarter of 1999 was largely confined to US dollar securities, which narrowly surpassed issuance in the euro-denominated instruments (see the graph on page 19). The pickup in US dollar issuance seemed largely to reflect a move towards more diversified funding sources by European issuers. Europeans issued $34 billion of dollar-denominated securities, after less than $1 billion in the dollar in the fourth quarter of 1999. Another factor promoting issuance in dollars was the above-mentioned growth in activity by emerging market borrowers, who continue to prefer the US currency.

As indicated in the graph on the previous page, borrowers from outside the euro zone had stepped up euro-denominated issuance in early 1999 relative to issuance in the legacy currencies. Since then, no clear trend in the use of the euro by such issuers has emerged. Towards the end of 1999, the proportion of net issuance in euros by non-euro area borrowers rose sharply, in conditions of generally subdued market activity in advance of the millennium changeover. The relatively slow pace of euro-denominated issuance in the first quarter of 2000 could similarly have reflected transitory market conditions. In particular, the continued weakness of the euro/dollar exchange rate may have suppressed investor interest in euro-denominated securities. Volatile credit and swap spreads could also have influenced the currency choices of issuers and investors. Given these conflicting short-term pressures, longer-term trends in the relative international issuance of euro and dollar liabilities may only become clear once foreign exchange and credit market conditions have stabilised.

Online underwriting breaks into the international bond market

Serge Jeanneau

The new year witnessed the emergence of electronic underwriting in the international bond market. The Federal Home Loan Mortgage Corporation ("Freddie Mac") launched the first international offering, a $6 billion issue of reference notes, marketed partly through the lead manager's proprietary online system. Several other issuers conducted similar syndications during the first quarter (see the table below).

Although these transactions attracted a great deal of publicity, the electronic underwriting of securities is not a new phenomenon. Borrowers in the US commercial paper and municipal bond markets have sold their securities over the web for some time. Even so, the development of electronic underwriting and trading has not been as rapid in fixed income markets as in some other major financial markets such as the foreign exchange, equity and derivatives markets. This lag can be attributed to the structure of fixed income markets: while they are large in the aggregate, they remain fragmented due to the large number of issues outstanding and the wide variety of specifications (in terms of maturities, coupons, credit quality and technical features). Moreover, trading has remained largely decentralised because transactions are conducted bilaterally by dealers outside organised exchanges.

Given that online primary market systems are in their infancy, actual benefits so far seem to have been modest. As is the case with other technological innovations, electronic underwriting systems create the potential for improved economic efficiency. However, the benefits of such systems will not be shared equally by all market participants. For example, the likely enhancement of market transparency in underwriting may be beneficial to issuers and investors but prove a mixed blessing for intermediaries, who may have benefited in the past from privileged market information. Some of the potential impacts of online underwriting on the various groups of market participants are considered below.

Large international bond issues launched over the internet in the first quarter of 2000

Issuer	Announcement date	Amount	Lead managers
FHLMC	5 January	$6bn	Warburg Dillon Read, Merrill Lynch, Salomon Smith Barney
FNMA	12 January	$10bn	Morgan Stanley Dean Witter, Goldman Sachs, Merrill Lynch
IBRD	18 January	$3bn	ABN Amro, Lehman Brothers, Goldman Sachs
Lehman Brothers Holdings	21 January	$2bn	Lehman Brothers
Abbey National Capital Trust 1	1 February	$1bn	Goldman Sachs, Lehman Brothers
FHLMC	15 February	$5bn	ABN Amro, Credit Suisse First Boston, JP Morgan Securities
Finland	15 February	€3bn	ABN Amro, Deutsche Bank
Compagnie de Financement Foncier	15 February	€1.3bn	CDC Marchés, Deutsche Bank
KfW International Finance	23 February	$2bn	Merrill Lynch, Morgan Stanley, Warburg Dillon Read
IBRD	29 February	$2bn	Warburg Dillon Read, Charles Schwab, Credit Suisse First Boston, Goldman Sachs, Paine Webber
Republic of Argentina	6 March	$1bn	Morgan Stanley
CIT Group	7 March	$1.3bn	Lehman Brothers, Warburg Dillon Read
Ford Motor Credit	9 March	$5bn	Chase Securities, Credit Suisse First Boston, JP Morgan Securities
Republic of Portugal	14 March	€1.5bn	ABN Amro, Merrill Lynch, Salomon Smith Barney

Source: Capital DATA.

For investors, the potential benefits of such systems include easier and cheaper information gathering, with the ability to compare prices across intermediaries and instruments, and the opportunity to issue orders online in real time.

From the point of view of issuers, a major potential benefit is the ability to broaden the investor base. Underwriters have traditionally focused on the largest institutional investors. The sale of securities through the internet will enable borrowers to access smaller institutional and retail investors directly. A broader investor base could in turn help lower borrowing costs. This potential, however, has yet to be fully exploited because the online underwriting of international securities has so far remained largely restricted to the biggest market participants. Most systems are proprietary and consist of sophisticated book-building facilities that are either operated centrally by the lead manager or jointly with the co-lead managers. They generally cater to other dealers and institutional investors rather than to retail investors. Although some underwriters have allowed individual investors to send orders online, few are in a position to allow such orders to be executed automatically.[①]

For intermediaries, however, the impact of such systems is less clear-cut. One obvious advantage is the lower cost of information dissemination. Another is the real-time monitoring of book-building, which should help them better determine the size and pricing of transactions, as well as their potential risk exposure. However, the ability of investors and issuers to "shop online" could increase their price sensitivity and shift the balance of power away from intermediaries. This could put downward pressure on underwriting commissions. Online systems might also lead to greater contestability of underwriting. The dominant position of the major underwriters could be challenged by the introduction of a successful system by a broker, data vendor or software developer. In fact, the threat of new entrants has been a driving force behind investment banks' creation of online systems for fixed income markets. Many investment banks are involved in several facilities at the same time in order to hedge their bets should some of the systems not live up to expectations. So as to encourage client loyalty and discourage new entrants, some investment banks have decided to cooperate in the provision of certain services. For example, a number of them have formed joint internet ventures in which investors have access to proprietary market research, new issue information and market prices.[②]

Reduced labour costs could help underwriters to maintain profit margins, but there has so far been little evidence of this type of cost saving. Investment banks have had to make heavy initial investments in online systems and have required extra staff to educate the various parties involved in their use. As a result, they have operated traditional and online underwriting systems in a parallel and complementary fashion. In addition, most online underwriting systems are not yet designed to conduct real-time auctions, so human intervention is still required for allocation and price setting.[③] In any case, human intervention is unlikely to be totally replaced by computer terminals since some issuers and investors will continue to value technical and investment advice, marketing expertise and support for secondary market trading. Nevertheless, the expanded use of online facilities over the medium term and the development of auction-based systems is likely to free up human resources in what has traditionally been a labour-intensive process.

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① See page 3 of *eCommerce in the US Fixed Income Markets*, The Bond Market Association, New York, November 1999.
② For example, in March this year six US investment banks established Securities.Hub, a portal supplying institutional investors with proprietary research and pricing information on secondary market trading. ③ Internet upstarts such as Muniauction Inc, which allow investors to bid for new bonds directly from issuers, have already introduced such systems (which were used in the sale of City of Pittsburgh bonds in 1999).

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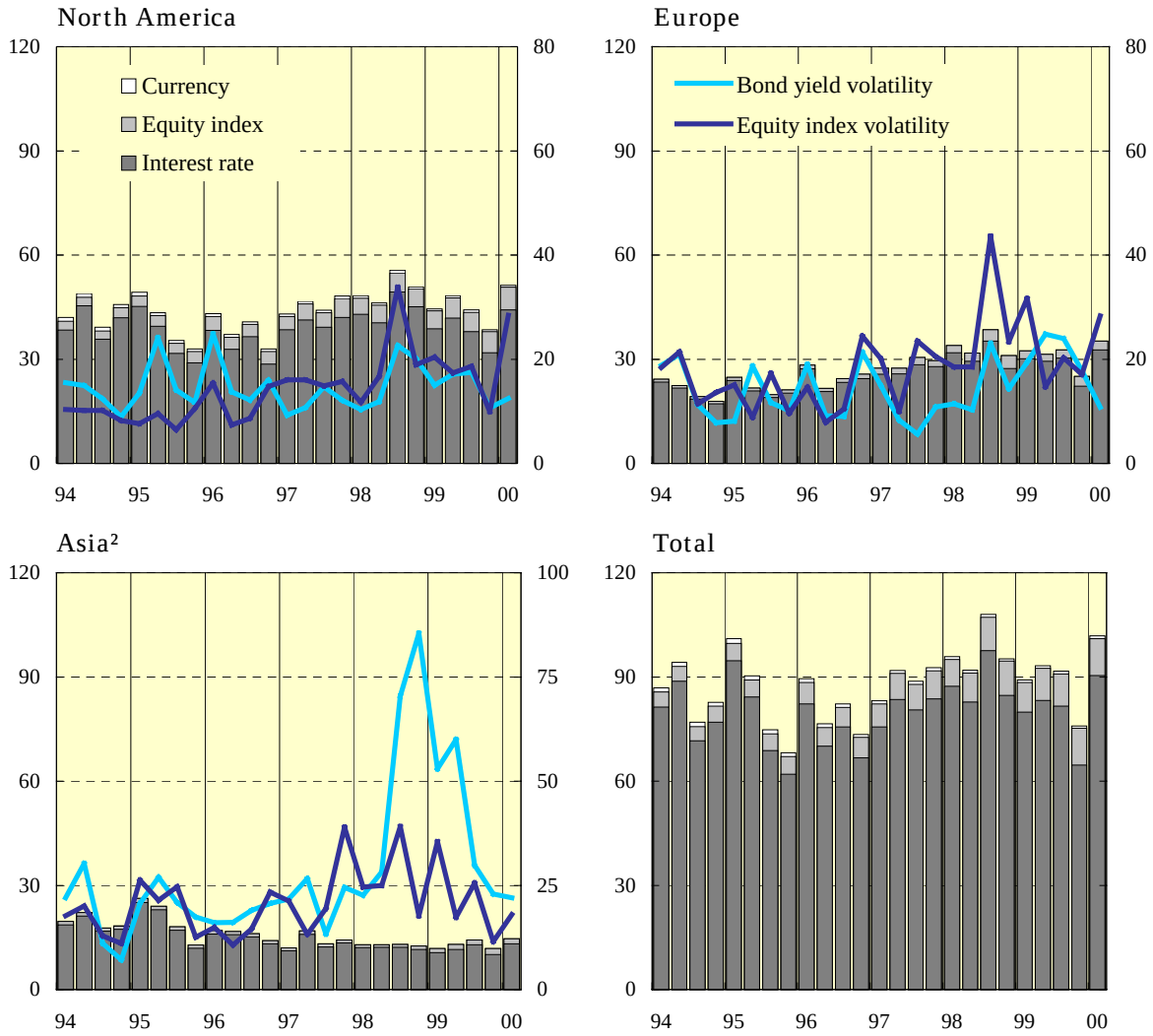
3. Derivatives markets

Exchange-traded business recovered strongly in the first quarter of 2000 from the slowdown seen at the end of last year, with much of the upsurge taking place in fixed income instruments. Somewhat surprisingly, the high level of activity seen on global equity markets, particularly in the high-technology sector, did not spill over to derivatives exchanges. With respect to over-the-counter (OTC) products, the most recent data published by the BIS show an acceleration of activity in the second half

Quarterly turnover of exchange-traded options and futures and bond yield and equity index volatilities[1]

In trillions of US dollars (left-hand scale) and percentages (right-hand scale)



[1] Annualised standard deviation of daily percentage changes in 10-year government bond yields and equity indices of US, German and Japanese markets for North America, Europe and Asia respectively. [2] Including Australia and New Zealand.

Sources: FOW TRADEdata; Futures Industry Association; BIS.

of 1999. This was in contrast to activity on exchange-traded markets, which experienced a decline over the same period. Much of the growth in business occurred in the interest rate swaps market, particularly in the euro and yen segments. A subdued level of activity in dollar swaps indicates a decline in arbitrage activity involving US Treasury securities and swaps.

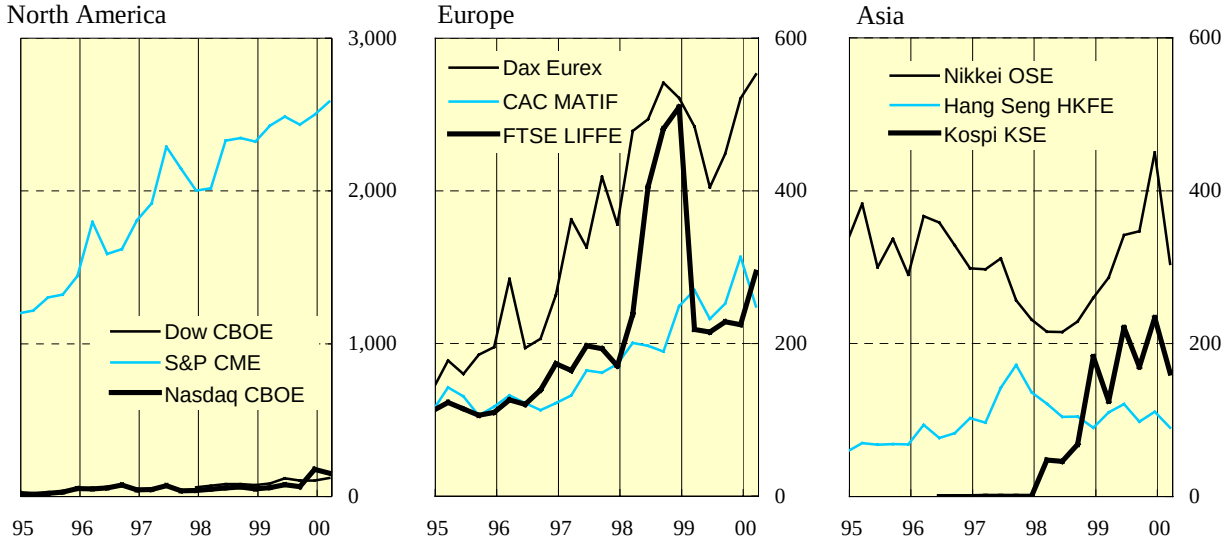
Exchange-traded instruments: a strong recovery follows the millennium slowdown

The return of financial market participants to more active trading in the first quarter of 2000 led to a sharp rebound in the aggregate turnover of exchange-traded financial derivative contracts monitored by the BIS (see the graph on the previous page).[5] The dollar value of turnover rose by 34%, to $102 trillion, the highest figure since the record $107 trillion observed in the third quarter of 1998. This upswing was, however, not entirely unexpected. Market participants had pared down their positions to a minimum in the fourth quarter of 1999 but the smooth transition to the new millennium quickly brought activity to more normal levels. A "catching-up" effect is also likely to have played a role.

The overall recovery of activity was nevertheless accompanied by some unusual trading patterns. Indeed, despite the widespread rise in equity market volatility, total trading in index-linked products remained flat (at about $11 trillion). This lack of buoyancy contrasted markedly with the record level of activity seen on some of the major equity contracts (see the graph below) and the high level of turnover in world equity markets. Moreover, the buoyancy of activity in high-technology stocks failed to spill over to related equity index contracts. Although the equity index segment had been less affected by the Y2K slowdown, the subdued level of activity is probably the result of deeper underlying factors. Equity index contracts which offer a broad exposure to equity markets might have

Turnover of major equity futures

Quarterly turnover in billions of US dollars

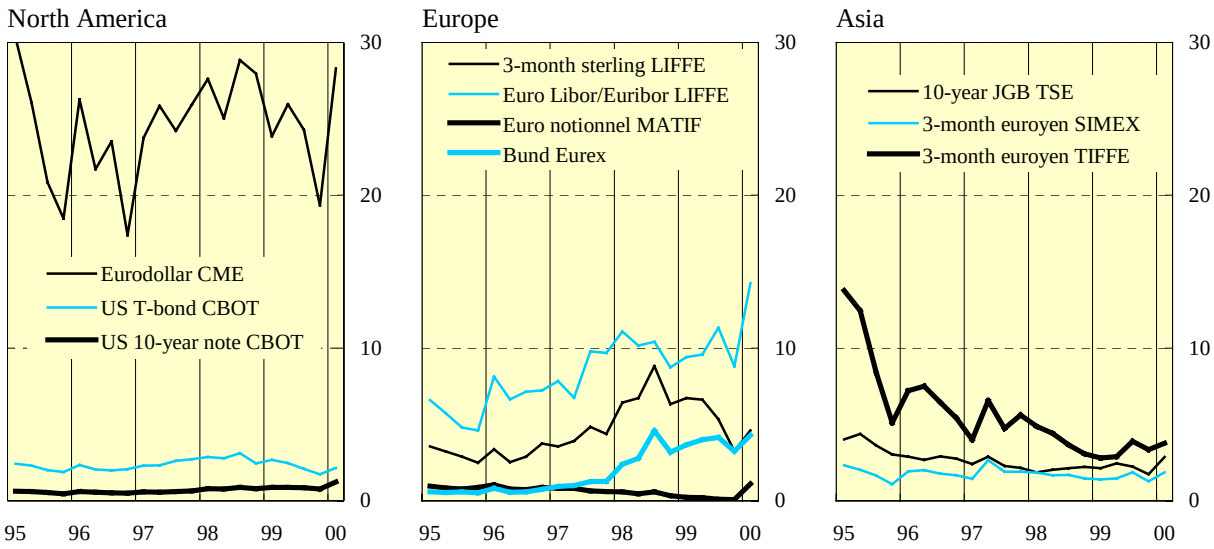


Sources: Futures Industry Association; FOW TRADEdata.

[5] The analysis is based on the dollar value of trading in fixed income, currency and equity index contracts. Value-based reporting reduces the impact on the aggregate figures of fluctuations in the turnover of small contracts and removes the distortions resulting from sudden changes in the unit value of contracts. However, such reporting has not yet been extended to commodity contracts or to options on single equities. For this reason, the analysis of activity by market risk categories is conducted on a value basis, while the ranking of exchanges is carried out using the total number of contracts traded (both financial and non-financial).

Turnover of major interest rate futures

Quarterly turnover, in trillions of US dollars



Sources: FOW TRADEdata; Futures Industry Association; BIS.

been less suitable for dealing with the risks of particular companies or sectors subject to sharp market swings. The lack of futures contracts permitting focused risk exposures may have led to some displacement of trading towards underlying securities and options on single equities (which are not included in the BIS value calculations). This may have been the case for retail investors in particular, who have expressed growing enthusiasm for stock picking. The strong increase in the price of traded options might also have deterred potential end-users of such products, leading them to seek cheaper bespoke structures in the OTC market (see the next subsection).

The story was quite different for exchange-traded fixed income derivatives in the first quarter of 2000, when the strong upsurge in activity (by 40%, to over $90 trillion) was spread across most geographical areas (see the graph above). Uncertainty about the extent of further monetary tightening in North America and Europe probably fuelled the particularly sharp recovery of money market instruments, with futures on eurodollar and Euribor rates rising by 46% and 62% respectively. Although conditions in the longer-term segment of the US yield curve became more volatile in February, following the US Treasury's announcement of a debt retirement programme centring on 30-year issues, the 23% increase in the trading of US Treasury bond futures largely reflected a rebound from the depressed levels seen at the end of last year. Activity in the US Treasury bond contract has been on a declining trend since the 1998 financial crisis. The environment was calmer in European bond markets but the growing use of the bund contract as a European benchmark was reflected in a 33% increase in its turnover.

There was also a broad-based recovery in the much smaller foreign exchange segment (by 17%, to $0.7 trillion). The continuing weakness of the euro against the US dollar and the yen was associated with more active use of trading instruments on those two currency pairs. With the euro breaching parity with the dollar, and with risk reversals showing that investors were concerned about a sharp depreciation of the euro, implied volatility on the dollar/euro pair reached a record high. Looking at the competitive position of exchanges, strong increases in the volume of a few options products enabled the CBOE to further strengthen its leading position in North America. In Europe, the sustained growth of contracts on German government bonds and the rapid expansion of the recently introduced DJ Euro STOXX 50 contract further reinforced the strong position achieved by Eurex. It is worth noting, however, that attempts by French banks to revive the French government bond contract appear to have borne fruit as turnover in the Euro notionnel recovered from a long period of decline.

Meanwhile, some of the recent structural trends seen in capital markets began to have a bearing on product innovation. In fixed income markets, a shrinking or slowing supply of government debt continued to encourage large issuers to introduce alternative trading benchmarks. In March the CBOT and the CME capitalised on the interest in such benchmarks by launching contracts on the debt securities of US government-sponsored financing agencies.[6] Volumes for April, the first full month of trading, show that the CBOT was able to benefit from its dominance in longer-term instruments, taking the lead in 10-year agency futures.[7]

Declining opportunities in standard fixed income and equity contracts also prompted exchanges to explore new business areas such as the trading and clearing of cash market securities and OTC contracts. In addition, some exchanges now seem to believe that the advantages conferred by their efficient clearing services could be profitably put to use outside the financial industry. LIFFE, for example, intends to develop a business-to-business portal that could be used for a variety of non-financial products and services.

OTC instruments: a return to growth in the second half of 1999

In May 2000, the BIS released its semiannual statistics on positions in the global OTC derivatives market for end-December 1999. These statistics constitute the fourth set of data released under a new regular reporting framework on OTC market activity. They include the *notional amounts* and *gross market values* outstanding of the *worldwide consolidated* OTC derivatives exposure of major banks and dealers in the G10 countries (see the table on the next page and Annex Tables 18-21).[8]

After adjustments for double-counting resulting from positions between reporting institutions, the total estimated notional amount of outstanding OTC contracts stood at $88.2 trillion at end-December 1999, an 8% increase over the amount reported for end-June 1999. This represents a significant acceleration relative to the first half of 1999, when business had expanded by a mere 1% from the previous half-year. Similar growth patterns have been reported by other surveys of OTC market activity.[9] On the other hand, the stock of exchange-traded contracts monitored by the BIS experienced a 6% contraction in the second half of 1999. This followed a 2% decline in the first half of that year.

The return to growth of the OTC market was essentially concentrated in the interest rate segment, with an increase in outstanding contracts of 11% over the previous half-year period (to $60.1 trillion). By contrast, there was a further contraction of foreign exchange instruments, which declined by 4% (to $14.3 trillion). The reduction of activity in this segment had been particularly pronounced in the first half of last year (17%), in the wake of the introduction of the single European currency. The much smaller equity-linked and commodity segments expanded the most rapidly of all underlying risk categories, with increases of 20% and 24% respectively (to $1.8 trillion and $0.5 trillion).

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6 The CBOT launched futures and options on 10-year securities, while the CME introduced futures on five- and 10-year securities.

7 With more than 92,000 contracts traded on the CBOT compared with slightly more than 4,000 on the CME.

8 The notional amount, which is generally used as a reference to calculate cash flows under individual contracts, provides a comparison of market size between related cash and derivatives markets. Gross market value is defined as the sum (in absolute terms) of the positive market value of all reporters' contracts and the negative market value of their contracts with non-reporters (as a proxy for the positive market value of non-reporters' positions). It measures the replacement cost of all outstanding contracts had they been settled on 31 December 1999. The use of notional amounts and gross market values produces widely divergent estimates of the size of the overall market and of the various market segments.

9 For example, data released by the International Swaps and Derivatives Association (ISDA) show that the outstanding stock of interest rate swaps, currency swaps and interest rate options grew by 11% in the second half of 1999. This represented an acceleration relative to the first half of the year, when business had only expanded by 3%. Quarterly data published by the US Office of the Comptroller of the Currency on holdings of derivatives by US banks (largely OTC contracts) also showed more rapid growth in the second half of 1999, to 5% from zero growth in the first half.

The global over-the-counter (OTC) derivatives markets[1]

Amounts outstanding, in billions of US dollars

	Notional amounts				Gross market values			
	End-June 1998	End-Dec 1998	End-June 1999	End-Dec 1999	End-June 1998	End-Dec 1998	End-June 1999	End-Dec 1999
Grand total	**72,143**	**80,317**	**81,458**	**88,201**	**2,580**	**3,231**	**2,628**	**2,813**
A. Foreign exchange contracts	**18,719**	**18,011**	**14,899**	**14,344**	**799**	**786**	**582**	**662**
Outright forwards and forex swaps	12,149	12,063	9,541	9,593	476	491	329	352
Currency swaps	1,947	2,253	2,350	2,444	208	200	192	250
Options	4,623	3,695	3,009	2,307	115	96	61	60
B. Interest rate contracts[2]	**42,368**	**50,015**	**54,072**	**60,091**	**1,160**	**1,675**	**1,357**	**1,304**
FRAs	5,147	5,756	7,137	6,775	33	15	12	12
Swaps	29,363	36,262	38,372	43,936	1,018	1,509	1,222	1,150
Options	7,858	7,997	8,562	9,380	108	152	123	141
C. Equity-linked contracts	**1,274**	**1,488**	**1,511**	**1,809**	**190**	**236**	**244**	**359**
Forwards and swaps	154	146	198	283	20	44	52	71
Options	1,120	1,342	1,313	1,527	170	192	193	288
D. Commodity contracts[3]	**451**	**415**	**441**	**548**	**38**	**43**	**44**	**59**
Gold	193	182	189	243	10	13	23	23
Other	258	233	252	305	28	30	22	37
Forwards and swaps	153	137	127	163	..	..	..	..
Options	106	97	125	143	..	..	..	..
E. Other[4]	**9,331**	**10,388**	**10,536**	**11,408**	**393**	**492**	**400**	**429**
Gross credit exposure[5]					**1,203**	**1,329**	**1,119**	**1,023**
Memorandum item: *Exchange-traded contracts[6]*	*14,792*	*13,932*	*14,440*	*13,522*	..	..	..	..

[1] All figures are adjusted for double-counting. Notional amounts outstanding have been adjusted by halving positions vis-à-vis other reporting dealers. Gross market values have been calculated as the sum of the total gross positive market value of contracts and the absolute value of the gross negative market value of contracts with non-reporting counterparties. [2] Single-currency contracts only. [3] Adjustments for double-counting estimated. [4] For end-June 1998: positions reported by non-regular reporting institutions in the context of the triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity; for subsequent periods: estimated positions of non-regular reporting institutions. [5] Gross market values after taking into account legally enforceable bilateral netting agreements. [6] Sources: FOW TRADEdata; Futures Industry Association; various futures and options exchanges.

While the acceleration of activity in the *interest rate segment* largely took place in the swaps market (15% to $43.9 trillion), the expansion of business in the options market was also fairly sustained (9% to $9.4 trillion). The forward rate agreement market, which had experienced a sharp increase in the first half of 1999, contracted by 5% to $6.8 trillion. The most recent data on the OTC interest rate market have confirmed the rapid development of non-dollar instruments. Indeed, while euro- and yen-denominated contracts accounted for the bulk of market expansion, the increase in dollar business was marginal. This enabled the euro-denominated sector to grow further in size and reinforce its lead over the US dollar segment (34% of outstandings versus 27%). The lethargic pace of activity in the latter segment is somewhat difficult to reconcile with reports of growing use of interest rate swaps as hedging and positioning alternatives to US Treasury securities. The withdrawal of certain US-based financial institutions from arbitrage activity since the crisis at the end of 1998, the paring-down of market-making capital by other institutions and the adoption of more conservative risk management policies might have reduced market liquidity and, therefore, hampered dollar business.

In the area of *currency instruments*, the stock of outright forward and forex swap contracts was stable following the sharp drop resulting from euro-related consolidation in the previous period. This was not

the case with the stock of currency options, which declined for the fourth consecutive half-year period. Meanwhile, business in currency swaps continued to exhibit a steady upward trend. A look at the currency breakdown for all types of foreign exchange positions reveals that activity moderated in contracts involving the three major world currencies, with the most pronounced decline being in yen contracts. Although the review period was marked by rising currency volatility, which could have been expected to fuel turnover, the steady strengthening of the yen against the two other major currencies might have led to a drying-up of some options products involving the yen, such as barrier options.[10] Moreover, the lower level of activity in currency derivatives might also have been the result of subdued activity in the underlying markets. Informal estimates by market participants suggest that there has been a sizeable decline in foreign exchange turnover in the major centres since autumn 1998.[11]

The *equity-linked sector* sprang to life in the second half of last year, with growth in outstandings of 20% (to $1.8 trillion). Business is likely to have been fuelled by the very strong performance of global equity markets during the review period. The most striking development in this market sector was the particularly pronounced increase in business with non-financial customers.

Commodity derivatives markets were also highly active, with amounts outstanding rising by 24% (to $548 billion). Transactions involving gold, the largest single component of the commodity derivatives market, were particularly buoyant. The review period was eventful for the broader gold market. The metal's price, which had followed a downward trend for much of the year, rose sharply in late September following an agreement among central banks limiting official gold sales over the next five years.

Estimated *gross market values* in the second half of 1999 rose by 7%, to $2.8 trillion, but their share of reported notional amounts remained stable at 3%. Allowing for netting, the derivatives-related credit exposure of reporting institutions was much smaller ($1 trillion).

[10] Barrier options include all options for which the payoff pattern and survival to expiration depend not only on the final price of the underlying but also on whether the underlying will reach or go through a set price (barrier) during the life of the option.

[11] See "A look at trading volumes in the euro", *BIS Quarterly Review*, February 2000, pp 33-35.

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III. Special feature: Evaluating changes in correlations during periods of high market volatility[*]

In computing measures of the market risk of a portfolio, such as Value at Risk, portfolio managers typically rely on estimates of correlations between returns on the financial instruments in the portfolio and on the volatility of those returns. This task is relatively simple if the correlations and volatilities do not change over time, and if there are sufficient data to allow them to be estimated fairly precisely. The task is vastly more difficult if the correlations change abruptly as a result of structural breaks in the mechanisms that determine asset returns – perhaps owing to the impact of contagion on the links between markets, changes in the sources of shocks, or new market structures or practices.[12] However, changes in correlation patterns may be no more than the natural and predictable effects of fluctuations in asset return volatility. In such cases, the problem facing risk managers should be less difficult, as the empirical challenge then consists of modelling the time-varying nature of asset return volatilities.

In periods of heightened market volatility, correlations between returns on financial assets tend to increase relative to correlations estimated during periods of normal volatility. For example, the average correlation between yield spreads for selected fixed income securities rose to 0.37 following the Russian crisis in August 1998 from 0.11 in the first half of 1998 (Committee on the Global Financial System (1999), Table A18). The increased correlation of returns during periods of high volatility is often explained as resulting from changes in the underlying relationships that determine returns.[13] Yet, probability theory shows that correlations between asset returns depend on market volatility even if the underlying relationships between returns have not changed; variations in correlations measured over different periods of time may merely be the consequence of variations in realised volatility.

This article explores the link between volatility and correlation, which has until recently largely been overlooked in the economics and finance literature.[14] The next subsection provides two numerical examples that demonstrate the dependence of correlations on volatilities, and also states a theorem that links variances and correlations. An empirical application is presented next, focusing on the behaviour

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[*] This article is based on a longer BIS conference research paper (Loretan and English (2000)). The authors are members of the research staff of the Board of Governors of the Federal Reserve System. The analysis and conclusions in this article are those of the authors and do not indicate concurrence by the Board of Governors, by the Federal Reserve System or by the BIS. We thank Jim Clouse, Mike Gibson, Michael Gordy, Brian Madigan, Henri Pagès, Matt Pritsker, Vince Reinhart and participants at the 1999 Central Bank Economists' Autumn Meeting at the Bank for International Settlements for helpful comments and discussions.

12 Recent discussions of possible routes for contagion include Drazen (1998), Eichengreen et al (1996) and Gerlach and Smets (1995). Kodres and Pritsker (1999) present a structural model of the contagion-like transmission of shocks.

13 For example, the increase in market volatility of US and other government securities in 1994 was accompanied by an increase in sampling correlations. In its 1995 annual report, Bankers Trust (1995) stated that movements in interest rates in 1994 were "unusual in the degree to which interest rates across international markets moved together" (p 23). The bank went on to note that "this phenomenon of increased correlation among interest rates reduced the risk management benefits derived from diversification across interest-sensitive instruments" (p 23). The bank responded to this situation by withdrawing from substantial market positions (p 24).

14 For previous economic and finance studies of the link between volatility and correlations, see Ronn (1995), Boyer et al (1999) and Forbes and Rigobon (1999).

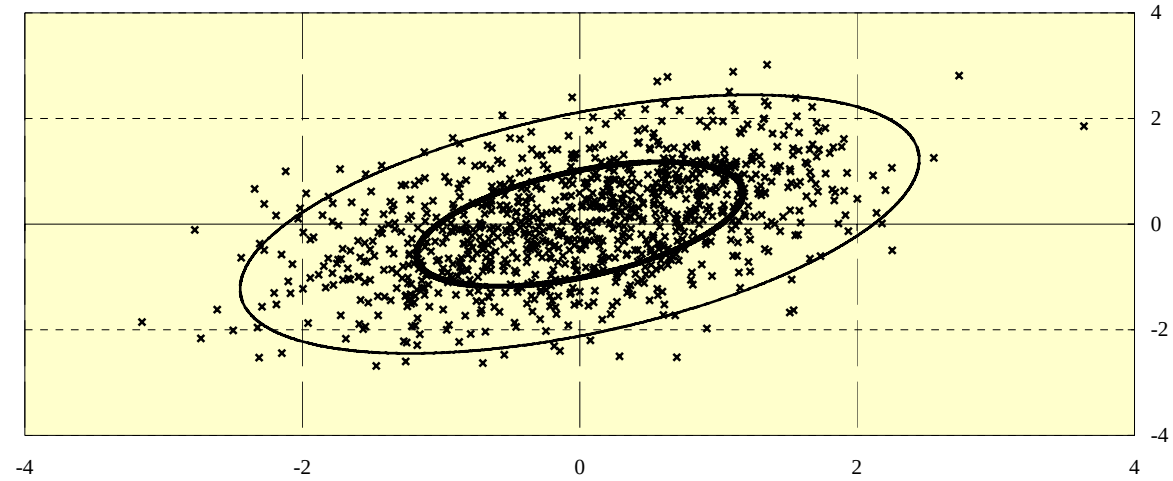
of equity returns in the United Kingdom and Germany during the past decade. We find that quarters in which the volatility of equity returns was high also tended to be quarters with above average correlations, in a manner that is consistent with a constant unconditional data generating process for equity returns. The final subsection discusses the implications of the link between volatility and correlation for risk management and for financial supervision.

The link between volatility and correlation

According to probability theory, when the movements of random variables are more volatile, sampling correlations between those variables *should* be elevated even if the underlying process generating the variables remains unchanged. Boyer et al (1999) provide a formal proof of this link (see the box on the next page).

To demonstrate the intuition that underlies this theoretical result, consider a pair of random variables, *x* and *y*, and suppose that the possible outcomes for these variables are distributed jointly normally with means equal to zero, variances equal to one and contemporaneous correlation equal to 0.5. A sample of 1,000 independent draws of such pairs is shown in the graph below. The thick and thin ellipses denote the areas that contain 50% and 95% of the total mass of the distribution respectively. Now suppose we split this sample into two subsamples based on the outcome of the variable *x*. One subsample would be "low volatility" and would include all *x* and *y* pairs for which the absolute value of *x* is less than 1.96.[15] The other subsample would be "high volatility" and would include all pairs for which the absolute value of *x* is greater than or equal to 1.96. Intuitively, the effect of excluding observations with large values of *x* should be to reduce the sample correlation between *x* and *y*. By contrast, the correlation for the high volatility subsample should be enhanced because one portion of that subsample picks up the large positive values of both variables while the other portion picks up the large negative values. As is noted in the graph below, the difference between the correlations in the two subsamples is large: the correlation for the high volatility sample is 0.81, while that for the low volatility sample is 0.45. Note that the correlation in the latter subsample is close to the population value of 0.5; this result may not be surprising since the low volatility subsample includes 95% of the data.

Bivariate normal random numbers, ρ = 0.5



[15] The distributions of *x* and *y* are standard normal by assumption. Hence, the absolute value of *x* is less than 1.96 with a probability of 95%.

A formal result

The intuitive link between volatility and correlation can be derived formally. Boyer et al (1999) provide the following theorem.

Theorem. Consider a pair of i.i.d. bivariate normal random variables x and y with standard deviations σ_x and σ_y, respectively, and covariance σ_{xy}. Let ρ $(=\sigma_{xy}/(\sigma_x\sigma_y))$ denote the unconditional correlation between x and y. The correlation between x and y conditional on an event $x \in A$, for any $A \subset \mathbb{R}$ with $0 < \text{Prob}(A) < 1$, is given by

$$\rho_A = \rho\left[\rho^2 + (1-\rho^2)\frac{\sigma_x^2}{\text{Var}(x \mid x \in A)}\right]^{-1/2} \tag{1}$$

Proof. [①] Let u and v be two independent standard normal random variables. Now construct two bivariate normal random variables x and y with means μ_x and μ_y, respectively, standard deviations σ_x and σ_y, respectively, and correlation coefficient ρ:

$$x = \mu_x + \sigma_x u \tag{2}$$

$$y = \mu_y + \rho\sigma_y u + \sqrt{1-\rho^2}\,\sigma_y v \tag{3}$$

Consider an event $x \in A$, for any $A \subset \mathbb{R}$ with $0 < \text{Prob}(A) < 1$. By definition, the conditional correlation coefficient between x and y, ρ_A, is given by

$$\rho_A = \frac{\text{Cov}(x, y \mid x \in A)}{\sqrt{\text{Var}(x \mid x \in A)}\sqrt{\text{Var}(y \mid x \in A)}} \tag{4}$$

By substituting for u in (3) using equation (2), then substituting the resulting expression for y into (4), and using the fact that x and v are independent by construction, one can rewrite this as

$$\rho_A = \frac{(\rho\sigma_y/\sigma_x)\,\text{Var}(x \mid x \in A)}{\sqrt{\text{Var}(x \mid x \in A)}\sqrt{(\rho^2\sigma_y^2/\sigma_x^2)\,\text{Var}(x \mid x \in A) + (1-\rho^2)\sigma_y^2}} \tag{5}$$

which can, in turn, be simplified to yield the expression in (1).

Thus, the conditional correlation between x and y is larger (smaller) than ρ in absolute value if the conditional variance of x given $x \in A$ is larger (smaller) than the unconditional variance of x.

[①] This proof is based on the property of bivariate normal random variables that each component can be expressed as the weighted average of the other and of an independent variable that is also normally distributed. See, for example, Goldberger (1991, p 75).

The theoretical link between volatility and correlation holds in a time series context as well. Consider subdividing a long time series of two variables, *x* and *y*, which are observed daily, into quarterly subsamples. For each subsample, calculate the variance of *x* and the correlation between *x* and *y*. Finally, order the subsamples by the variance of *x*. The table on the next page shows the results of such an exercise under the assumption that *x* and *y* are independent and normally distributed, with unit variances, and a constant correlation coefficient equal to 0.5 (as in the graph on the previous page). The first column of the table shows ranges for the ratio of the quarterly sampling variance in *x* to its population value (which is 1). The other three columns show the distribution of quarterly correlation values for the samples in those ranges. For quarters with in-sample variance of *x* close to its population value (0.9 to 1.1), the median sampling correlation is 0.50. However, the distribution of sampling

In-sample correlations when conditioning on volatility

Range of variances of x relative to its population variance	Conditional correlation of x and y		
	Bottom 5%	Median	Top 5%
0.3–0.5	0.17	0.36	0.53
0.5–0.7	0.24	0.43	0.58
0.7–0.9	0.29	0.47	0.61
0.9–1.1	0.34	0.50	0.64
1.1–1.3	0.38	0.54	0.67
1.3–1.5	0.41	0.57	0.69
1.5–1.7	0.45	0.59	0.71
1.7–1.9	0.48	0.61	0.72

Note: The random variables x and y are i.i.d. bivariate normal with a population correlation coefficient ρ of 0.5. Reported values for Corr(x,y) are based on 2.5 million random draws of "quarters" (consisting of 60 "daily" data pairs). There were too few observations with a variance of x less than 0.3 or greater than 1.9 times its population value for values of Corr(x,y) to be reported with confidence.

correlations is fairly wide, with a 90% confidence interval running from 0.34 to 0.64. In contrast, for quarters with in-sample variance of x between 1.7 and 1.9 times its population value, the median correlation is 0.61, with the 90% confidence interval running from 0.48 to 0.72. In other words, in this time series example, periods of increased sampling volatility are also periods of relatively high measured correlations, even when the population correlation remains constant.

An empirical application

In order to assess the real-world applicability of this theoretical link between volatility and correlation, we need to consider whether it can explain the historical relationship between pairs of asset returns. Are contemporaneous changes in sampling variances and sampling correlations empirically consistent with an unchanged underlying distribution of asset returns, and, in particular, with a constant population correlation?

We consider stock prices as measured by the FTSE and Dax stock price indices.[16] These data series represent large and liquid markets and reflect market conditions at roughly the same time, and so we do not have to be concerned about the implications of non-synchronous data collection.[17] Our data are daily observations from the beginning of 1991 to the middle of 1999. The returns are calculated as daily percentage changes in the respective price indices.

The graph on the next page shows time series plots of the within-quarter variances (left-hand panel) and correlations (right-hand panel) of the daily stock market returns. It is clear that autumn 1998 was a period of high volatility and, just as the theoretical results would suggest, one of elevated correlation.

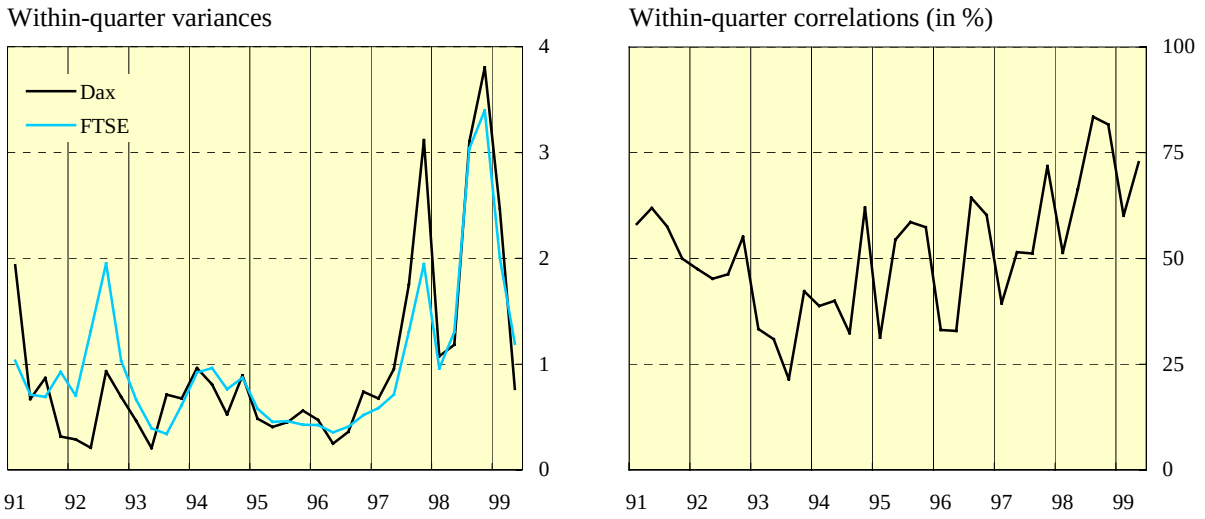
To evaluate the importance of the theoretical link between volatility and correlation more generally, we show in the graph on page 34 a scatterplot of the quarterly in-sample correlations against the in-

[16] In Loretan and English (2000) we present results for returns on government bonds and foreign exchange as well. See also Forbes and Rigobon (1999) for a detailed examination of the link between volatility and correlation in equity prices. The FTSE and Dax data are from Bloomberg, and reflect closing quotes.

[17] For a discussion of the problems associated with non-synchronous data collection, see RiskMetrics (1996, pp 184-196).

sample volatility of the return on the Dax (the lines in the graph are discussed below).[18] The graph clearly shows a generally increasing relationship between the sample variances and sample correlations; the observations for the final two quarters of 1998 comprise two of the three observations at the top right. Although the upward slope in the graph on the next page is consistent with theoretical expectations, the data also show a considerable dispersion in the sample correlation for a given level of sample volatility. In order to provide a more compelling test of whether the population correlation is constant, we need to determine whether the empirical relationship lies mostly within a confidence band around the expected average relationship between volatility and correlation, where the expected relationship and the confidence band are based on the assumption of a constant distribution of the asset returns. One way to construct the theoretical expectations and confidence band is to use a bootstrap, which is based on repeatedly drawing observations from the actual data. Specifically, we select a random sample of a quarter's worth of observations (60 pairs of returns) from the observed data series and calculate the sample variances of the two returns and the sample correlation between the return series. We then repeat the process a large number of times (2 million random samples in total), thereby producing a very large number of correlation-variance pairs. We then use these random observations to calculate the median value of the correlation as a function of the volatility as well as 90% confidence intervals around that median.[19] The resulting lines are plotted in the graph on the next page.

Within-quarter variances and correlations, Dax and FTSE indices

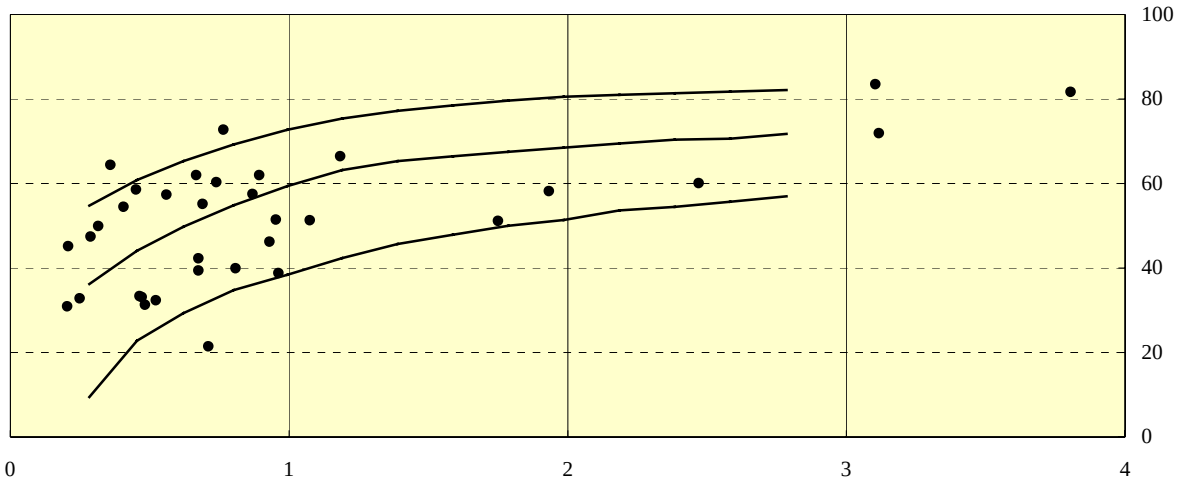


[18] The correlations could be plotted relative to the volatility of either return; use of the FTSE index yields similar results. Note that the within-quarter variance of the return on the Dax has been expressed relative to its full-sample value.

[19] Note that the median correlation and the confidence intervals are based on the actual distributions of the data series rather than on an assumed distribution, such as the bivariate normal. Our earlier study, Loretan and English (2000), shows both the bootstrap results and those based on a bivariate normal distribution. The median values are similar, but the confidence contours are wider under the bootstrap; this appears to be due to the fact that the actual returns have more outlier observations than would be implied by a normal distribution. The bootstrap procedure preserves the unconditionally heavy-tailed nature of the distributions as well as the contemporaneous correlation structure of the data. However, it does not take account of serial dependence features such as GARCH, which, as discussed in Loretan and English (2000), appear to be present in the data.

Quarterly variances vs quarterly correlation, bootstrapped confidence bands

In percentage points[1]



[1] The vertical axis shows the quarterly correlation of the Dax vs the FTSE. The horizontal axis shows the relative quarterly variances of Dax returns.

The equity data fit the pattern implied by the simple theory surprisingly well.[20] The observations are scattered fairly evenly around the median line, and only a few of the 34 observations lie outside the 90% confidence contours. While a more comprehensive test is beyond the scope of this article, our results suggest that one should not be too quick to conclude that fluctuations in correlations during periods of market volatility, including those observed in the second half of 1998, represent true changes in the distribution of asset returns. Rather, they may be nothing more than the predictable consequences of observing certain (low probability) draws from an unchanged distribution. This conclusion need not imply that "contagion" does not occur: rather, it suggests that if one defines contagion to mean elevated sample correlations between asset returns, then contagion can be a natural by-product of high sampling volatilities.

Implications

The statistical link between sampling volatilities and correlations of asset returns has important implications for the evaluation of portfolio risk by market participants and investors as well as for the supervision of financial firms' risk management practices.

Risk managers sometimes use data from a relatively short interval when calculating correlations and volatilities for use in risk management models. Some estimation methods are based on longer intervals of data, but they apply geometrically declining weights, thereby reducing the effective number of observations employed. The theoretical and empirical results presented here suggest that the use of relatively short intervals of data for estimating correlations and volatilities may be dangerous. If the interval happens to be atypically stable, then not only may the estimated volatilities be too low, but, perhaps more important, the estimated correlations between returns will be lower than average. As a result, assessments of market risk may overstate the amount of diversification in a portfolio, leading the investing firm to take on excessive risk. Conversely, if the interval of data employed is a relatively

[20] Our results are based on the volatility of asset returns with no distinction made between increases and decreases in asset prices. In a related study, Longin and Solnik (1998) find that measured correlations between equity returns in different countries behave as the theory would suggest when there are large positive stock market returns but are higher than the theory would suggest when there are large negative returns. We leave an examination of this issue for future research.

volatile one, then the resulting estimates of correlations will be atypically high and could lead the firm to take positions that are excessively risk-averse.

This does not necessarily imply that the use of longer time series produces more reliable calculations. Indeed, short intervals have some desirable features. Since financial markets can change over time, one may not want to depend on data from the distant past.[21] Moreover, the emphasis on recent data allows account to be taken of time-varying volatility, which appears to be a feature of actual returns. However, our results suggest that when determining the appropriate time interval to use, risk managers should not exclude periods of relatively high or low volatility. Such periods contain important information about the underlying relationship between asset returns.

Another way in which the link between in-sample volatility and correlation could cause problems for risk managers is in the calculation of worst case scenarios and in stress testing. Put simply, risk managers should not consider the possible effects of high return volatilities without also taking into account the higher correlations between asset returns that would generally accompany the elevated volatility (see Ronn (1995) for a related discussion). One way to do so would be to employ information from historical periods of high volatility in order to form estimates of correlations conditional on being in a period of heightened volatility.[22] These conditional correlations could then be used to evaluate the distribution of returns under a high volatility scenario. Put differently, the method used for stress testing a portfolio must not (inadvertently) exclude the empirical feature that periods of high volatility are also likely to be periods of elevated correlation.

Supervisors of financial institutions also need to be aware of the link between volatilities and correlations when assessing firms' risk management practices. For example, in evaluating such firms' internal models, supervisors need to keep in mind the difficulties noted earlier with relying on a relatively short interval of data for information on correlations and the need to form appropriate conditional correlations for stress tests.

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[21] Similarly, if the assets under consideration are firm-specific (rather than indices), the behaviour of firms can change over time as managers or business strategies are changed, making older information less useful.

[22] Alternatively, firms might want to use actual data from earlier periods of high volatility to stress test their portfolios. For example, Chase Manhattan uses asset price movements during three historical episodes - the bond market sell-off in 1994, the 1994 Mexican peso crisis and the 1997 Asian markets crisis - as well as internally developed scenarios, when assessing the risk of its portfolio (Chase Manhattan (1999, p 37)).

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IV. Structural and regulatory developments

Initiatives and reports concerning financial markets

January

The Institute of International Finance (IIF) released the results of a survey showing that emerging market economies had made progress in the provision of economic data to capital market participants.[23] The survey indicated that the Asian crisis had been followed by improvements in almost all of the 27 emerging market economies covered but that some countries still had a long way to go to meet IIF standards relating to comprehensiveness, frequency and timeliness. The IIF noted that there was scope for improvement in the reporting of external debt data (particularly short-term debt and repayment schedules) by a large number of economies. It also recommended that credit rating agencies take greater account of transparency in general and data dissemination practices in particular.

February

The Commodity Futures Trading Commission (CFTC) transmitted to the US Congress a staff report recommending changes to the regulatory structure administered by the CFTC.[24] The report proposes to reduce the regulatory burden faced by US futures markets by creating a more flexible framework whereby "one size fits all" rules would be replaced by general core principles. The blueprint outlines three kinds of facilities, which would be subject to various levels of oversight depending on the nature of the commodities traded and the sophistication of market participants. At the same time, the framework provides OTC markets with greater legal certainty.

The US Securities and Exchange Commission (SEC) issued a concept paper seeking comments on the rescission of Rule 390 and the issue of market fragmentation. Rule 390 bars members of the New York Stock Exchange (NYSE) from trading stocks listed before 1979 outside an established exchange.[25] On market fragmentation, the paper deals with a broad range of issues, including the implications of multiple trading systems and the internalisation of transactions by broker-dealers. The SEC is seeking comment on whether the lack of order interaction caused by fragmentation is or will become a problem for the markets; this issue is currently the subject of heated debate in US financial markets.

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[23] See *Data Release Practices of Emerging Market Economies: 1999 Assessment*, Institute of International Finance, Washington, DC, January 2000.

[24] See *A New Regulatory Framework*, Commodity Futures Trading Commission, Washington, DC, February 2000. At a hearing of the US Senate Committee on Agriculture, the Chairman of the US Federal Reserve, Alan Greenspan, called on the US Congress to exempt most US OTC derivatives markets from the Commodity Exchange Act. He said that the legal uncertainty faced by market participants was posing unacceptable risks to the country's financial system and could cause the loss of profit and employment opportunities to foreign jurisdictions that maintain the confidence of investors without imposing so many regulatory constraints.

[25] In 1999 the New York Stock Exchange voted to rescind the rule.

The IIF and the International Swaps and Derivatives Association (ISDA) released a joint study on the multiple credit risk modelling systems used by 25 commercial banks from 10 countries.[26] The document is based both on surveys of the qualitative aspects of modelling systems and on a detailed quantitative testing of selected models. On the qualitative side, the report notes that the use of modelling systems is likely to increase substantially in the near future. On the quantitative front, little was said about model risk (ie the risk created by financial institutions' dependence on their own models and risk projections) but important conclusions were reached:

- When assumptions, parameters and portfolios are standardised, outputs are broadly similar when the same version of the model is used
- Models yield directionally consistent outputs when given similar inputs
- Within model types, most differences in output reflect differences in model inputs, preprocessing, valuation and errors in model usage during testing
- Some differences in model outputs could also be attributed to differences in the analytical engines used and in versions of the same model

March

The Committee on the Global Financial System (CGFS) of the G10 Governors released a report on stress testing by large financial institutions.[27] The group investigated the use of stress testing and explored the possibility that aggregating the results of financial firms' stress tests might produce information of use to central banks, other financial regulators and private sector practitioners. Drawing on interviews with risk managers at large, internationally active financial institutions, the group concluded that stress testing is likely to remain an important element of the risk management strategies of large financial firms. The first chapter of the report summarises current practice in stress testing and discusses some of its limitations. With regard to the aggregation of stress test results, the group concluded that while, under ideal circumstances, aggregate stress tests could potentially provide useful information in a number of areas, it is as yet unclear whether those circumstances prevail. Some of the considerations which might be involved in setting up an aggregate stress test exercise, and the limitations to the potential usefulness of such an exercise, are examined in the second chapter. The report recommends conducting a one-off survey of the scenarios used by risk managers. Such a survey would add to the overall transparency of the risk management process and allow firms to improve information-sharing, at a relatively low cost in terms of reporting burden.

The Financial Stability Forum (FSF) held its third meeting and exchanged views on potential threats to the stability of the international financial system.[28] The FSF received reports from three working groups set up at its first meeting in April 1999 to address concerns related to highly leveraged institutions (HLIs), capital flows and offshore financial centres (OFCs), and endorsed their recommendations together with concrete policy actions.[29]

- The working group on HLIs recommended a package of measures to address both systemic risk and market dynamics concerns arising from the activities of HLIs (especially hedge

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[26] See *International Banks to Strengthen Use of Portfolio Credit Risk Modelling Systems*, IIF-ISDA, London, Washington and New York, February 2000.

[27] See *Stress Testing by Large Financial Institutions: Current Practice and Aggregation Issues*, Committee on the Global Financial System, Basel, March 2000.

[28] Established by the G7 in February 1999, the Forum aims to promote international financial stability through enhanced cooperation in financial supervision and surveillance. It comprises national authorities responsible for financial stability in significant international financial centres, international financial institutions, international supervisory and regulatory bodies, and central bank expert groupings. The Forum is chaired by Andrew Crockett, General Manager of the Bank for International Settlements, in a personal capacity.

[29] The three working group reports are available on the FSF website (*www.fsforum.org*).

funds). The measures include strengthened risk management practices by HLIs and their counterparties, enhanced regulatory oversight of HLI credit providers and enhanced public disclosure by HLIs and other counterparties.[30] The group also considered, but did not recommend, direct regulation of currently unregulated HLIs. The FSF emphasised that direct regulation would be reconsidered if, upon review, the implementation of the report's recommendations was not adequately addressed.

- The working group on capital flows recommended that national authorities put in place a risk management framework for monitoring and assessing the risks created by large and volatile capital flows. The group pointed to important ways in which national authorities and international bodies should support this process, for example by addressing gaps in available statistics, encouraging greater transparency and eliminating laws and regulations that inadvertently encourage imprudent behaviour.
- The working group on OFCs concluded that enhanced implementation of international standards by OFCs, particularly as regards regulation and supervision, disclosure and information-sharing, would help address concerns about some OFCs. The group's recommendations spell out a process for assessing adherence to international standards, identify standards for priority implementation and propose a menu of incentives that could be applied to encourage compliance.

ISDA published the results of its most recent collateral survey, which found that the management of credit limits was a key factor driving the development of collateral management.[31] Expanded credit capacity, increased liquidity and savings on capital costs were other important determinants of growing collateral use. However, the document also noted that legal uncertainty, infrastructure limitations, lack of expertise and the narrowness of collateral eligibility tables were the principal constraints on further market expansion.

Initiatives and reports concerning financial institutions

January

The Basel Committee on Banking Supervision (BCBS) issued two consultative papers that added further detail to proposed amendments to the Capital Accord released in June 1999. The first document puts forward guidelines for the disclosures that banks should make in order to advance the role of market discipline.[32] It covers three areas: capital structure, risk exposures and capital adequacy. Fact-finding surveys conducted by the BCBS show that there are significant gaps in the information currently disclosed. The recommendations made in the paper are aimed at closing these gaps and at increasing transparency and comparability. The second paper assesses current practice in banks' internal rating systems and processes.[33] The BCBS's Models Task Force is seeking to develop an alternative approach for minimum capital requirements, based on banks' internal credit ratings, while also reviewing the existing standardised capital requirements for credit risk.[34] The report presents the

[30] US legislators are considering a bill calling for new disclosure requirements for the largest US hedge funds. In its current form, the proposed legislation would require quarterly reporting of items such as total assets, leverage ratios and market risks. The bill would be aimed at funds with total assets of more than $3 billion or net assets of more than $1 billion.

[31] See *ISDA Collateral Survey 2000*, International Swaps and Derivatives Association, London and New York, March 2000.

[32] See *A New Capital Adequacy Framework: Pillar Three, Market Discipline*, Basel Committee on Banking Supervision, Basel, January 2000.

[33] See *Range of Practice in Banks' Internal Rating Systems*, Basel Committee on Banking Supervision, Basel, January 2000.

[34] In spring 1999 the Basel Committee's Models Task Force received a mandate to embark on a study of banks' internal rating systems and processes, and to evaluate the options for relating internal ratings to a regulatory scheme.

preliminary findings of the Task Force in developing this approach - including an assessment of current practices in rating systems and processes, and the range of practices across institutions. While it appears that there is currently no single standard for the design and operation of an internal rating system, a small number of alternative approaches emerged from the Task Force's analysis.

The Capital Group of the BCBS released a paper on issues relating to credit risk mitigation techniques as a basis for discussion between the bank supervisors of the G10 countries and industry associations within their jurisdiction.[35] The purpose of the Group's work was to seek information on how credit risk mitigation techniques are used within risk management systems and to elicit some initial thoughts on the issues discussed in the proposed amendments to the Capital Accord.[36] The document is divided into two main parts. The first covers general points on the use of credit risk mitigation techniques by banks and their treatment under the Capital Accord. The second discusses various topics such as residual risks, the extent of risk reduction and issues relating to individual credit risk mitigation techniques. The BCBS believes that the capital framework should include better recognition of risk mitigation techniques, reflecting the significant increase in recent years in the use and range of such techniques, as well as in the ability to manage the associated risks.

The BCBS published an anniversary review of the steps that banks and supervisors have taken since the publication of *Sound Practices for Banks' Interactions with Highly Leveraged Institutions* in January 1999.[37] The review, which is based on an informal survey, reveals that both banks and supervisors have responded to the risks posed by HLIs following the near collapse of Long-Term Capital Management in autumn 1998. Progress has been made with respect to banks' awareness of the potential risks in dealing with HLIs, due diligence in credit policies, collateral management arrangements and risk measurement practices. Supervisory authorities have taken various steps to inform the banking institutions under their jurisdiction of the BCBS's concerns and recommendations. Some supervisors have included a review of banks' risk management policies and practices with respect to HLIs in their regular on-site examinations, while others have also requested detailed exposure information on banks' lending to HLIs or on their exposures arising from derivatives and other transactions. However, the Committee believes that further efforts are required to lock in improvements in banks' risk management approach, including in technical areas such as potential future exposure measurement, collateral management and stress testing.

February

As part of ongoing efforts to strengthen banks' risk management, the BCBS released a paper outlining sound practices for the management of liquidity.[38] Liquidity is considered crucial to the ongoing viability of any bank, but its importance transcends the individual bank since a shortfall at a single organisation could have systemic repercussions. The proper management of liquidity is therefore vital. Over time, there has been a declining ability to rely on core deposits and an increased reliance on wholesale funding. Recent technological and financial innovations have provided banks with new ways of funding their activities and managing their liquidity, but the recent turmoil in global financial

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35 See *Industry Views on Credit Risk Mitigation*, Capital Group, Basel Committee on Banking Supervision, Basel, January 2000.

36 In its paper *A New Capital Adequacy Framework*, the BCBS indicated that it plans to refine its approach to the treatment of credit risk mitigation techniques in the banking book.

37 See *Banks' Interactions with Highly Leveraged Institutions: Implementation of the Basel Committee's Sound Practices Paper*, Basel Committee on Banking Supervision, Basel, January 2000.

38 See *Sound Practices for Managing Liquidity in Banking Organisations*, Basel Committee on Banking Supervision, Basel, February 2000.

markets has posed new challenges for liquidity management. In the light of these developments, the new paper supersedes the Committee's 1992 liquidity framework.[39]

In an attempt to close existing loopholes, US federal banking regulators[40] proposed new capital rules for asset securitisation. The new regulations would impose higher capital requirements on banks that provide loss protection for investors in asset-backed securities (ABSs). In order to entice investors to purchase ABSs, banks that originate such transactions usually agree to absorb credit-related losses on the underlying assets by retaining the riskiest tranches of the securities. Under current rules, full capital backing is required for assets sold with such recourse. However, banks have been able to reduce their capital charges by using third-party credit enhancements, for which capital has to be held only against the face amount of the assets rather than against their full value. Under the proposed rules, the capital charge against these credit enhancements would be increased to the same level as that for assets sold with recourse. The proposals would also link capital charges to securities ratings.

In response to a report of the President's Working Group on Financial Markets,[41] five hedge funds released a document setting out sound risk management practices for the hedge fund industry.[42] The document also complements the work of the Counterparty Risk Management Policy Group, which addressed many of the same issues from the perspective of credit providers.[43] The hedge funds recommend inter alia that:

- Senior management should allocate capital and risk on the basis of defined investment objectives and risk parameters, and control the allocation based on information supplied by an independent risk monitoring function
- Hedge fund managers must recognise that market, credit and liquidity risks are interrelated, requiring the hedge fund manager to analyse the consequences of the fund's exposure to these combined risks
- Fund managers should assess how funding liquidity may be compromised during periods of stress and seek to establish reliable sources of financing in order to enhance financial stability in volatile market conditions
- Managers should focus on measures of leverage that relate the riskiness of the portfolio to the ability of the fund to absorb that risk, or risk-based leverage

Initiatives and reports concerning market infrastructure

March

Euroclear, the Brussels-based international clearing house, and SICOVAM SA, the French clearing house, announced a full merger of their operations. The combined firm, which will be called Euroclear Clearance System PLC, will be the world's largest international clearing and settlement organisation, ahead of Clearstream, created by an earlier merger of Cedel SA and Deutsche Börse Clearing, and the

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39 See *A Framework for Measuring and Managing Liquidity*, Basel Committee on Banking Supervision, Basel, September 1992.

40 The Federal Reserve Board, the Federal Deposit Insurance Corporation, the Office of the Comptroller of the Currency and the Office of Thrift Supervision.

41 See *Hedge Funds, Leverage and the Lessons of Long-Term Capital Management*, President's Working Group on Financial Markets, Washington, DC, April 1999.

42 See *Sound Practices for Hedge Fund Managers*, Caxton Corporation, Kingdon Capital Management LLC, Moore Capital Management Inc, Soros Fund Management LLC and Tudor Investment Corporation, New York, February 2000.

43 See *Improving Counterparty Risk Management Practices*, Counterparty Risk Management Policy Group, New York, June 1999.

Settlement Alliance, formed by CrestCo Ltd of the United Kingdom and SIS SegaInterSettle of Switzerland. The firm is expected to become clearer for Euronext, the stock exchange alliance launched in March by the Belgian, Dutch and French stock markets.

Chronology of major structural and regulatory developments

Month	Body	Initiative
January 2000	Basel Committee on Banking Supervision	• Release of *A New Capital Adequacy Framework, Range of Practices in Banks' Internal Rating Systems, Industry Views on Credit Risk Mitigation* and *Banks' Interactions with Highly Leveraged Institutions: Implementation of the Basel Committee's Sound Practices Paper*
	Institute of International Finance	• Publication of *Data Release Practices of Emerging Market Economies, 1999 Assessment*
February 2000	Basel Committee on Banking Supervision	• Release of *Sound Practices for Managing Liquidity in Banking Organisations*
	Institute of International Finance and International Swaps and Derivatives Association	• Release of *International Banks to Strengthen Use of Portfolio Credit Risk Modelling Systems*
	US Commodity Futures Trading Commission	• Release of *A New Regulatory Framework*
	US federal banking regulators	• Proposal for new capital rules for asset securitisation
	US hedge funds	• Release by five US hedge funds of *Sound Practices for Hedge Fund Managers*
	US Securities and Exchange Commission	• Issuance of concept paper seeking comments on the abrogation of Rule 390 and the issue of market fragmentation
March 2000	Committee on the Global Financial System	• Release of *Stress Testing by Large Financial Institutions: Current Practices and Aggregation Issues*
	Euroclear and SICOVAM	• Both entities announce a full merger of their operations
	Financial Stability Forum	• Release of reports by working groups on highly leveraged institutions, capital flows and offshore financial centres
	International Swaps and Derivatives Association	• Release of *ISDA Collateral Survey 2000*

Refocusing the Bretton Woods institutions: the state of the debate

Philip Wooldridge

As part of ongoing efforts to strengthen the architecture of the international financial system, a number of proposals have recently been made for refocusing the International Monetary Fund and the World Bank. Since their founding at the Bretton Woods conference in 1944, the activities of the IMF and the World Bank have expanded beyond the purposes set out in their Articles of Agreement. The IMF has increasingly become involved in longer-term structural reforms and concessional lending to poorer countries, areas that have traditionally been the responsibility of the World Bank. The World Bank, in turn, has been called on to provide short-term balance of payments support to countries experiencing a temporary loss of market confidence, a role that falls under the mandate of the IMF.

To a certain extent, this expansion of activities reflects the significant changes in the global economy since the Bretton Woods conference, as well as a growing awareness of the interdependence of macroeconomic policies and structural reforms. The IMF and the World Bank have in recent years made a concerted effort to cooperate more closely with one another so as to reduce overlap and exploit synergies, especially in the areas of financial sector reform and poverty reduction. Nevertheless, there is growing support for further clarification of their respective roles.

Debate about the appropriate role of the Bretton Woods institutions focuses primarily on their lending facilities: to whom and on what terms should the IMF and the World Bank lend hard currency? Support seems to be emerging for phasing out longer-term IMF lending to countries with market access and for discouraging repeated borrowing. Beyond that, there is little agreement about the role of the IMF in long-term lending. The Group of Seven industrial countries[①] stress that the IMF must continue to provide concessional assistance to poor countries. The Meltzer Commission,[②] on the other hand, recommends that IMF lending be limited to the provision of short-term liquidity assistance, and that longer-term lending for poverty reduction or structural reform cease.

There is a broad consensus that, in order to mitigate moral hazard, the IMF should in most circumstances adhere to predefined lending limits[③] and take appropriate steps to involve the private sector in the resolution of crises. However, there is some disagreement about how best to translate these principles into practice. Lawrence Summers,[④] Secretary of the US Treasury, emphasises that the IMF must continue to be in a position to provide very large-scale financing in the event of a systemic crisis. The Goldstein Report[⑤] also recognises the potential need for exceptional financing, but recommends instituting special approval procedures for access above normal lending limits. With regard to private sector involvement, the G7 countries have outlined a framework intended to guide the international community's policy response to different crises, and the IMF[⑥] is building on this framework. The Goldstein Report suggests that the IMF should be prepared to support a temporary payments standstill, but the Institute of International Finance (IIF)[⑦] and other market associations stress the importance of voluntary approaches to private sector involvement. At its April 2000 meeting, the International Monetary and Financial Committee of the IMF[⑧] emphasised that the access, pricing and other aspects of official financing facilities should provide incentives for countries to take preventive measures. The Meltzer Commission proposes that the IMF lend only to countries that meet minimum prudential standards; in the event of a crisis, countries

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① Group of Seven (2000): "Statement of G7 Finance Ministers and Central Bank Governors", 15 April, http://www.ustreas.gov/press/releases/ps556.htm. See also Group of Seven (1999): "Report of G7 Finance Ministers to the Köln Economic Summit", 18 June, http://www.library.utoronto.ca/g7/finance/fm061999.htm. ② International Financial Institution Advisory Commission, US Congress (2000): "Report to Congress", March, http://phantom-x.gsia.cmu.edu/IFIAC/USMRPTDV.html. ③ The IMF's current guidelines on access limits, which were adopted in 1994, limit loans under a standby arrangement or extended Fund facility to 100% of quota annually and 300% of quota cumulatively. Access limits are reviewed periodically. ④ Lawrence Summers (1999): "The right kind of IMF for a stable global financial system", remarks to the London School of Business, 14 December, http://www.ustreas.gov/press/releases/ps294.htm. See also Lawrence Summers (2000): "Testimony before the House Banking Committee", 23 March, http://www.ustreas.gov/press/releases/ps480.htm. ⑤ Independent Task Force sponsored by the Council on Foreign Relations (1999): "Safeguarding prosperity in a global financial system: The future international financial architecture", October, http://www.foreignrelations.org/public/ pubs/IFATaskForce.html. ⑥ IMF (2000): "Report of the acting Managing Director to the International Monetary and Financial Committee on progress in reforming the IMF and strengthening the architecture of the international financial system", 12 April, http://www.imf.org/external/np/omd/2000/report.htm. ⑦ Institute of International Finance (1999): "Involving the private sector in the resolution of financial crises in emerging markets", April, http://www.iif.com/PublicPDF/ EmergingMarkets0499.pdf. ⑧ International Monetary and Financial Committee of the Board of Governors of the IMF (2000): "Communiqué", 16 April, http://www.imf.org/external/np/cm/2000/041600.htm.

that had pre-qualified for assistance would receive funds without further negotiation. The Goldstein Report rejects explicit eligibility criteria, but recommends that the IMF lend on more favourable terms to countries that take effective steps to reduce their vulnerability to crises.

Proposals for refocusing the financing activities of the World Bank tend to emphasise the importance of poverty reduction and structural reform. There is little support for continued World Bank involvement in short-term crisis lending, although the IIF, among others, advocates the wider use of partial guarantees by the multilateral development banks to facilitate borrowers' return to capital markets. With respect to financial assistance for poverty reduction, the Meltzer Commission proposes that the World Bank make greater use of grants to fund improvements in health care, education and infrastructure, and stop lending to countries with high credit ratings or relatively high per capita incomes. However, G7 finance ministers and central bank governors support continued World Bank lending to countries with large numbers of people living in poverty, regardless of a country's access to capital markets or average income.

The Bretton Woods institutions have recently taken steps to respond to the various proposals for refocusing their activities. In particular, the IMF has initiated a review of its non-concessional financing facilities. Four facilities have been eliminated, and the design of the remainder is being reconsidered.