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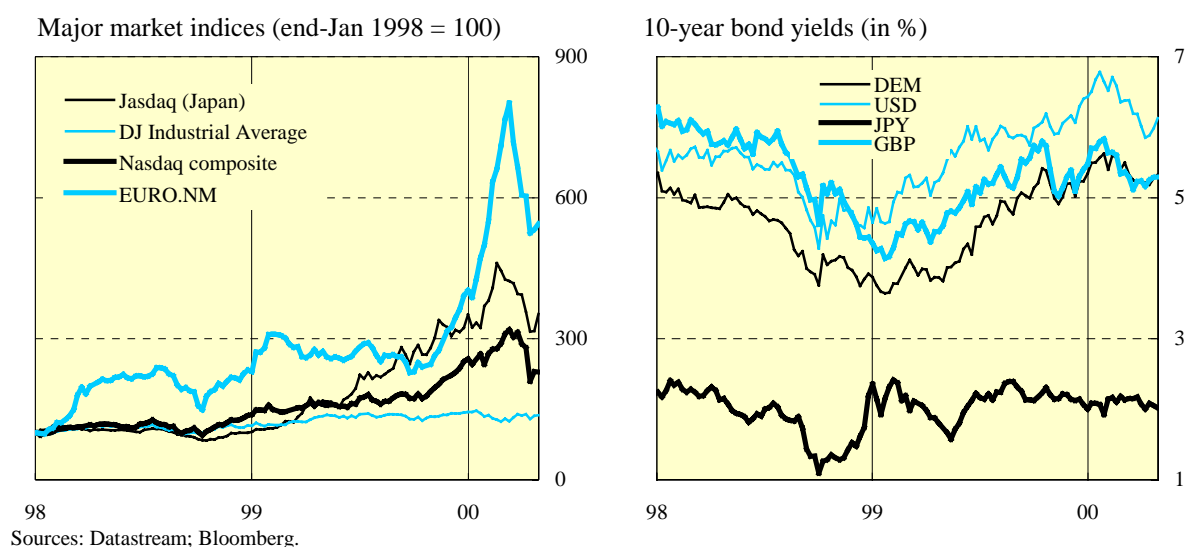
## I. Overview of global financial developments: Volatility besets the markets

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.

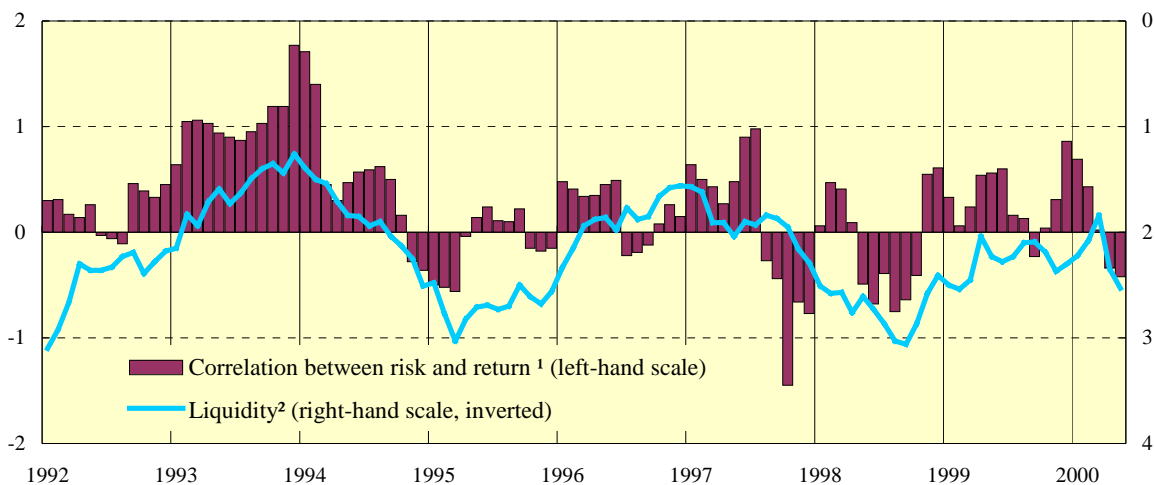
This volatility seems to have taken its toll on investors' willingness to bear risk. Credit spreads widened by more than could be accounted for by the decline in benchmark government bond yields. An indicator based on the relationship between realised returns in a given month and historical volatility 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



### Investors' attitude towards risk and liquidity



<sup>1</sup> Slope coefficient of a cross-sectional regression of realised returns on historical volatility for a number of asset classes. <sup>2</sup> 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.

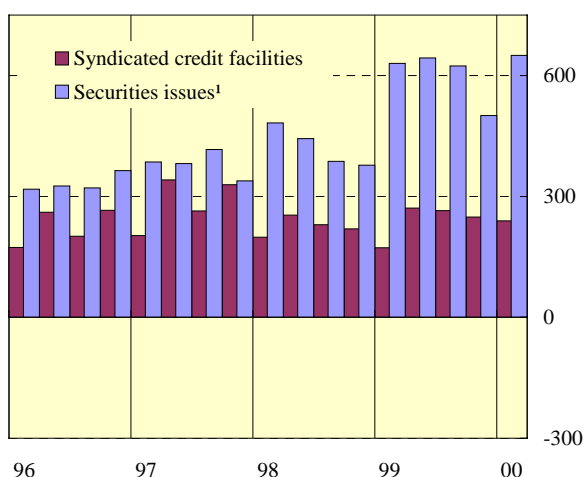
Sources: Datastream; national data; BIS estimates.

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.

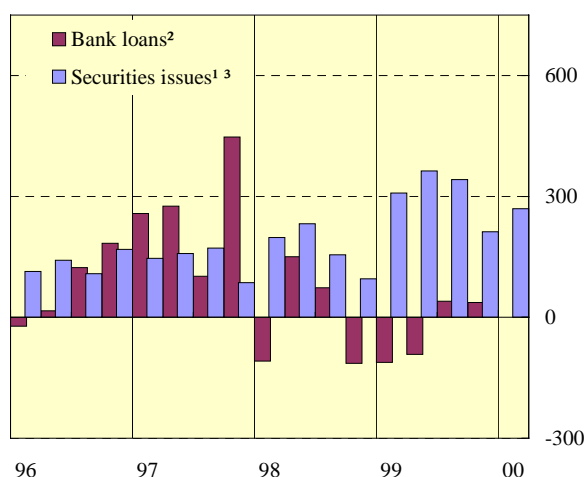
### Activity in cross-border bank loans and securities markets

In billions of US dollars

Announcements



Effective financing: total



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

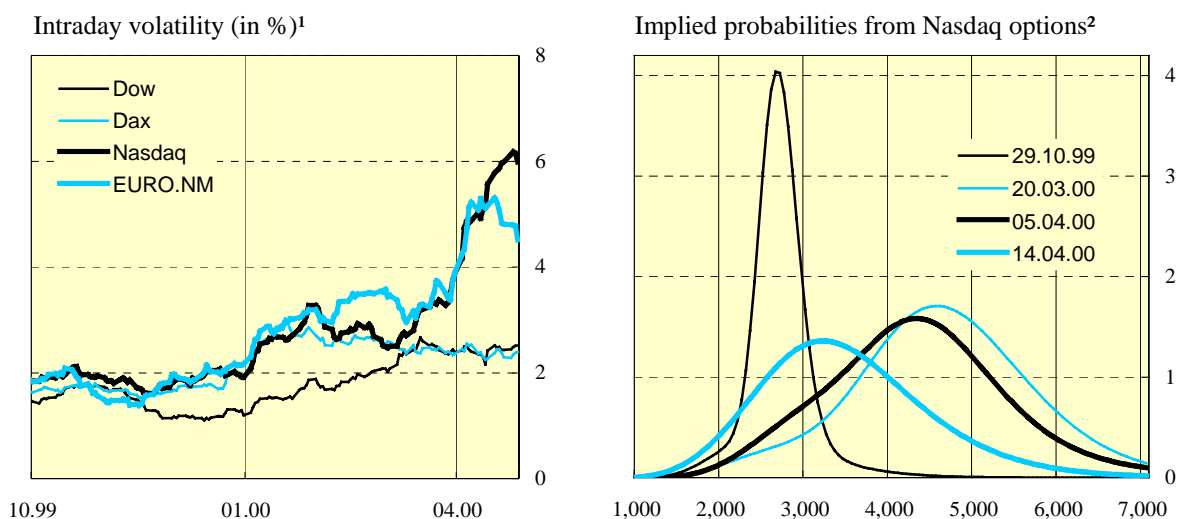
Order flows seemed to drive the prices of technology stocks to an extraordinary degree. Since macroeconomic data and companies' earnings reports tend to be announced outside trading hours, intraday price movements are often an indication of the effect of order flows, as orders can be

### 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



<sup>1</sup> Measured as the 20-day average of the high minus the low and divided by the closing price. <sup>2</sup> 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

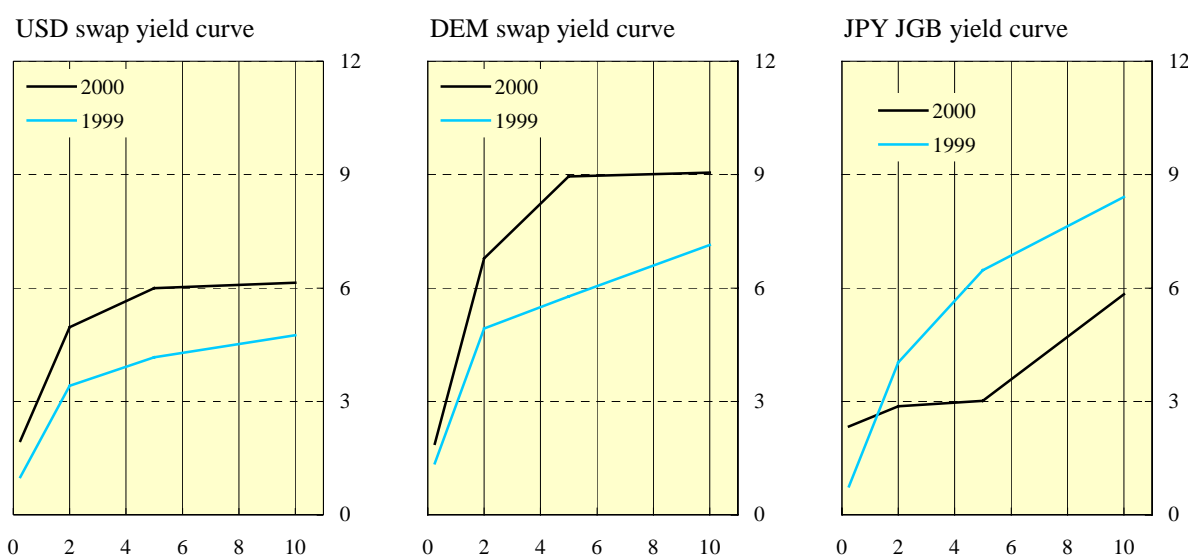
the euro against the dollar rose from 8.8% in the fourth quarter of 1999 to 10.7% in the first four months of 2000, while that of the yen against the dollar increased from 11.2% to 12.4%. In early 2000, however, investor interest in a particular currency from one day to the next did not seem to coincide 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.<sup>1</sup> 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<sup>1</sup>

In basis points



<sup>1</sup> 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.

<sup>1</sup> 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

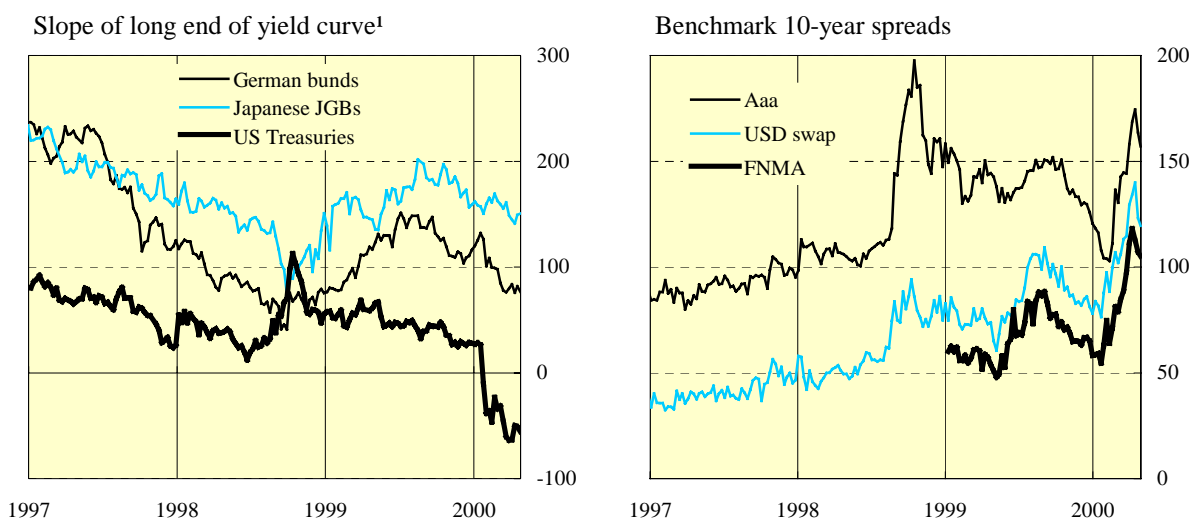
Sources: Bloomberg; Datastream.

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

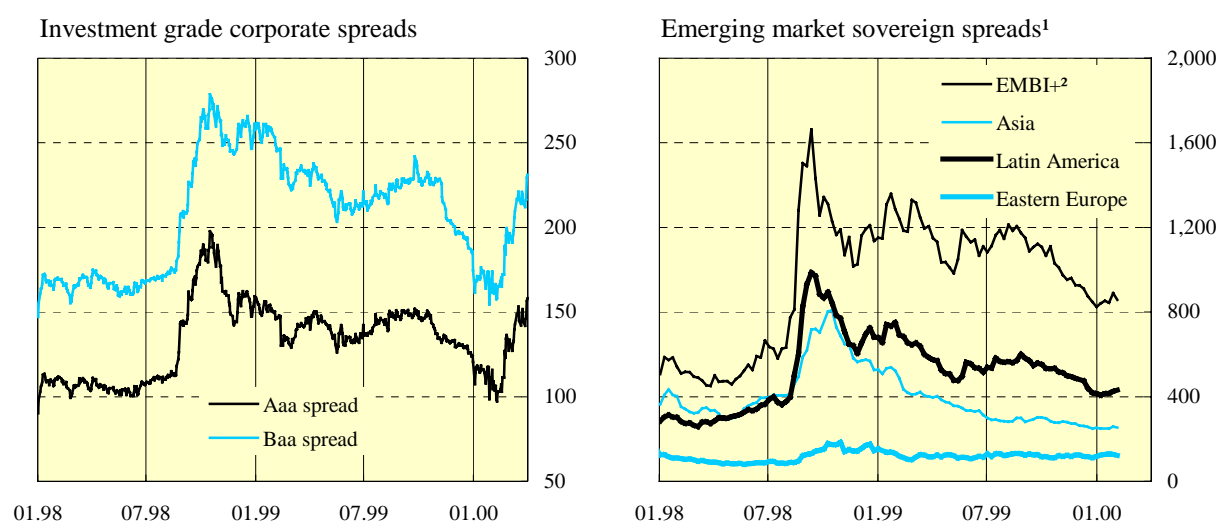
In basis points



<sup>1</sup> 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



<sup>1</sup> Average of actively traded international bond spreads (one per country). <sup>2</sup> 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.

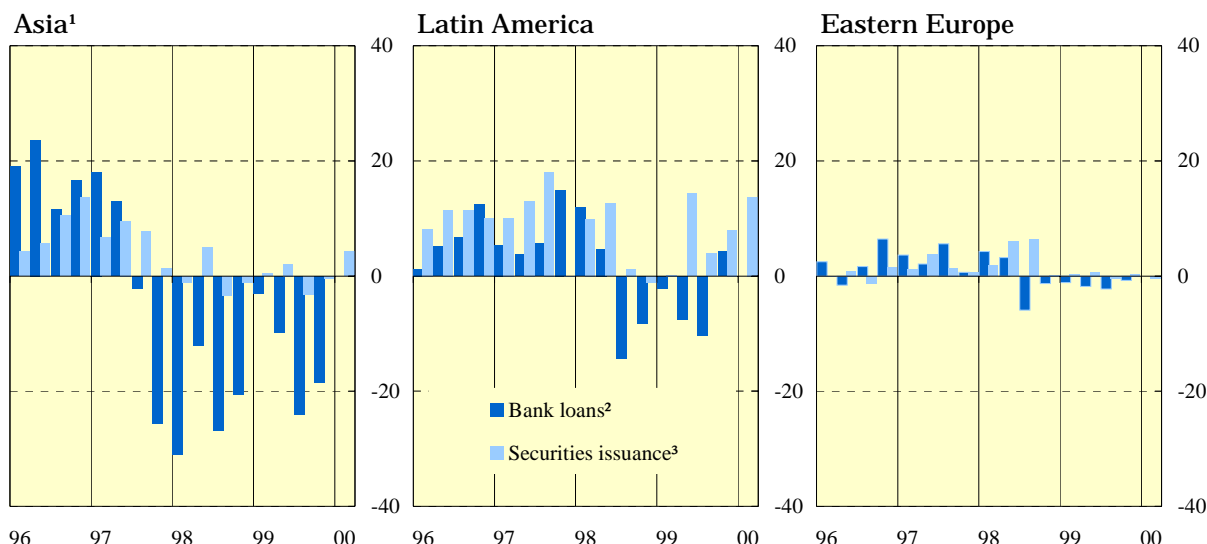
### BIS data show roles of OTC derivatives and bank investment

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



<sup>1</sup> Excluding Hong Kong, Japan and Singapore. <sup>2</sup> 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. <sup>3</sup> 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.