BIS QUARTERLY REVIEW

November 2000

INTERNATIONAL BANKING AND FINANCIAL MARKET DEVELOPMENTS

BANK FOR INTERNATIONAL SETTLEMENTS
Monetary and Economic Department
Basel, Switzerland

Copies of publications are available from:

Bank for International Settlements
Information, Press & Library Services
CH-4002 Basel, Switzerland

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This publication is available on the BIS website (www.bis.org).

ISSN 1012-9979
Also published in French, German and Italian.

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I. Overview of global financial developments: Markets confront shifting expectations

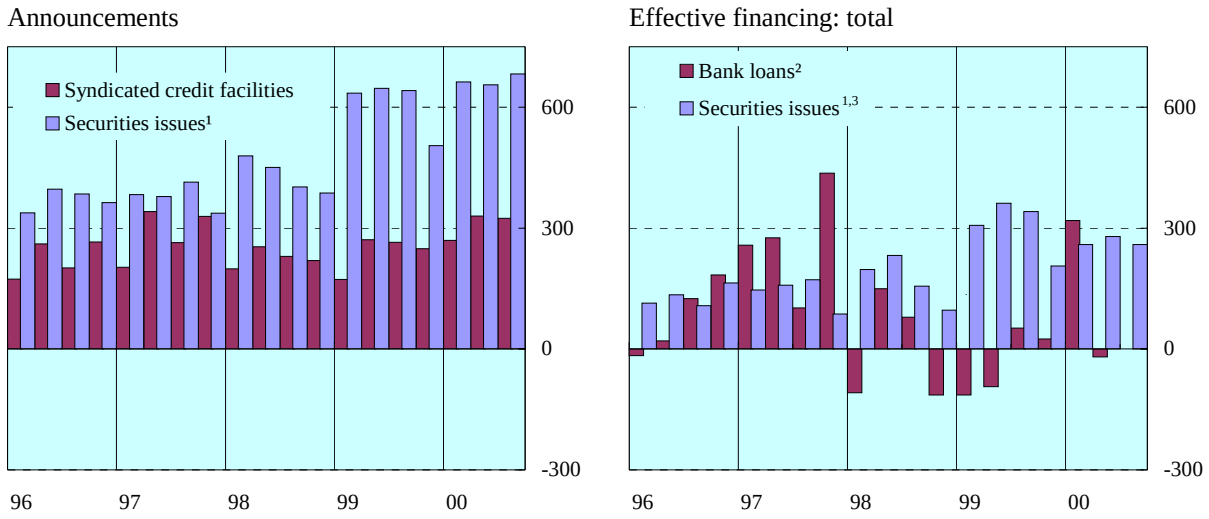
From the summer to early autumn of 2000, financial markets moved from a climate of cautious optimism to one of growing apprehension. In July and August, macroeconomic data releases and policy measures signalled a more or less benign financial environment. In September, however, as macroeconomic and corporate earnings forecasts were revised downwards and oil prices rose, market participants suddenly began to show signs of nervousness. In the equity market, a brief rally in August was decisively reversed in September and October. Apprehension spread to corporate bonds, which experienced wider credit spreads and increased scrutiny of highly leveraged issuers, including telecommunications firms. These events were accompanied by a resumption of the euro's weakening trend, which continued until the end of October. Among other things, this trend appeared to reflect renewed market concerns about growth prospects in the euro area.

To some degree, financial market jitters have reflected continued attempts to find equilibrium in a situation of rapid technological change and uncertainty about the persistence of recent high rates of productivity growth in the United States. Equity valuations have tended to rely on optimistic expectations about prospects for continued profit growth, which for a time were reinforced by earnings reports. Once earnings began showing signs of slowing and prominent credit downgrades began to be made, however, equity and debt valuations became vulnerable to sharp revisions of expectations. The strength of the dollar against the euro and other currencies has resulted at least in part from

Graph I.1

Activity in cross-border bank loans and securities markets

In billions of US dollars



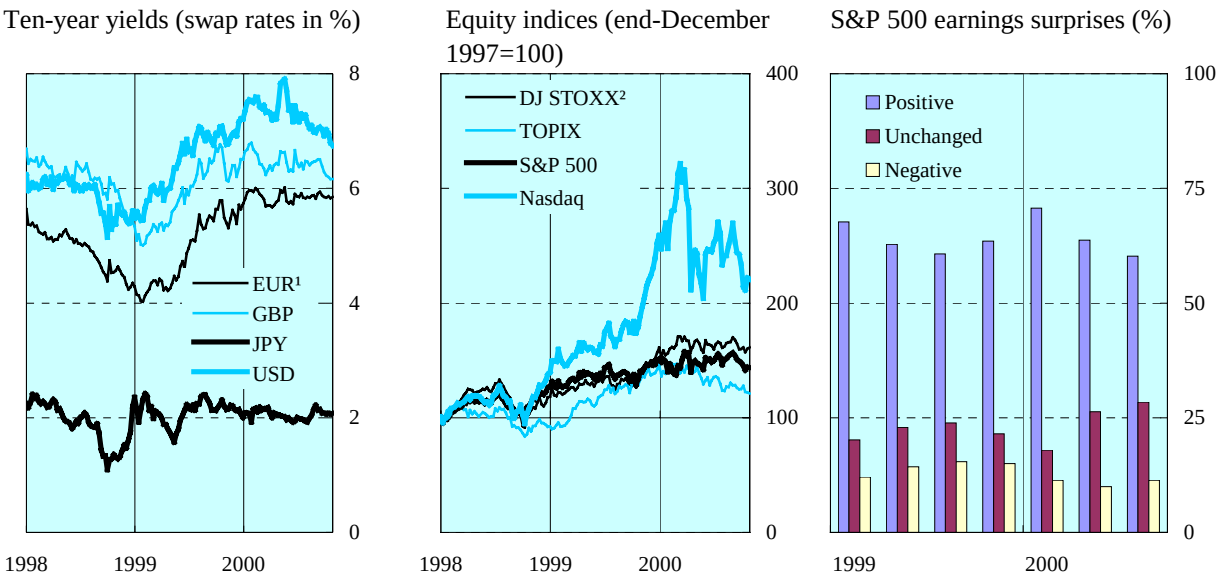
¹ Includes both money market instruments and long-term bonds and notes. ² Exchange rate adjusted changes in cross-border bank loans. Data for bank loans are available only up to 2000 Q2. ³ Gross issues minus repayments.

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

Graph I.2

Global fixed income and equity markets

Weekly averages



¹ Prior to 1999, Deutsche mark. ² Dow Jones index of European stocks

Sources: Bloomberg; Datastream; national data.

long-term capital flows from overseas investors into the United States driven by strong confidence in future returns. These flows may also have reflected a complementary scepticism about the ability of Europe and other regions to achieve similar levels of productivity growth through structural reforms.

The adverse conditions in financial markets led some firms to defer their borrowing plans. Financial institutions, the largest group of borrowers, reduced their net issuance of international debt securities in the third quarter by 27% relative to the previous quarter. Other borrowers shifted from issuing long-term fixed rate bonds to floating rate or convertible instruments, or went to the syndicated loan market. Nonetheless, the aggregate level of fund raising was maintained, in part because a third group of issuers were relatively less sensitive to concerns about credit risks. In particular, highly rated state agencies and government-sponsored enterprises stepped up their issuance to make up for the absence of other borrowers in the market for long-term fixed rate securities.

Despite investors' increased sensitivity to credit risk, developing country borrowers were able to maintain the recent moderate pace of debt issuance during the third quarter. Latin American and Caribbean countries issued $6.9 billion of international debt securities net of repayments and continued to refinance their Brady debt with cheaper issues at longer maturities. However, spreads on emerging market bond issues widened sharply in October, after more than a year during which they had narrowed appreciably. Equity markets and exchange rates in some countries, particularly in East Asia, were adversely affected by worries about rising oil prices, political instability and the uncertain progress of reform measures.

BIS data for the second quarter show that the role of the international banking market continued to accommodate the shift of borrowers to the securities market (Graph I.1), both through banks' own large-scale purchases and through the provision of bridge loans to borrowers who would subsequently refinance these loans by issuing long-term securities. Evidence from the syndicated loan market shows that telecommunications firms were among the principal users of bridging finance in the first quarter. These firms stepped up their issuance of securities in the second quarter, before the rise in credit spreads in the third sent them back to the syndicated loan market.

Equity markets harbour renewed doubts about earnings

The sell-off in global equity markets, which began in late March but showed signs of a reversal over the summer, regained momentum in September and October (Graph I.2, middle panel). The sell-off was concentrated in high-technology stocks. Over the five and a half months from mid-March to end-August, the broad-based S&P 500 index and the Europe-based Dow Jones STOXX index both experienced significant swings but ended up virtually unchanged in local currency terms, while the Nasdaq and Tokyo (TOPIX) indices fell by roughly 15%. A brief rally in August was decisively reversed in early September when analysts revised downwards their earnings projections for semiconductor manufacturers and wireless equipment makers.

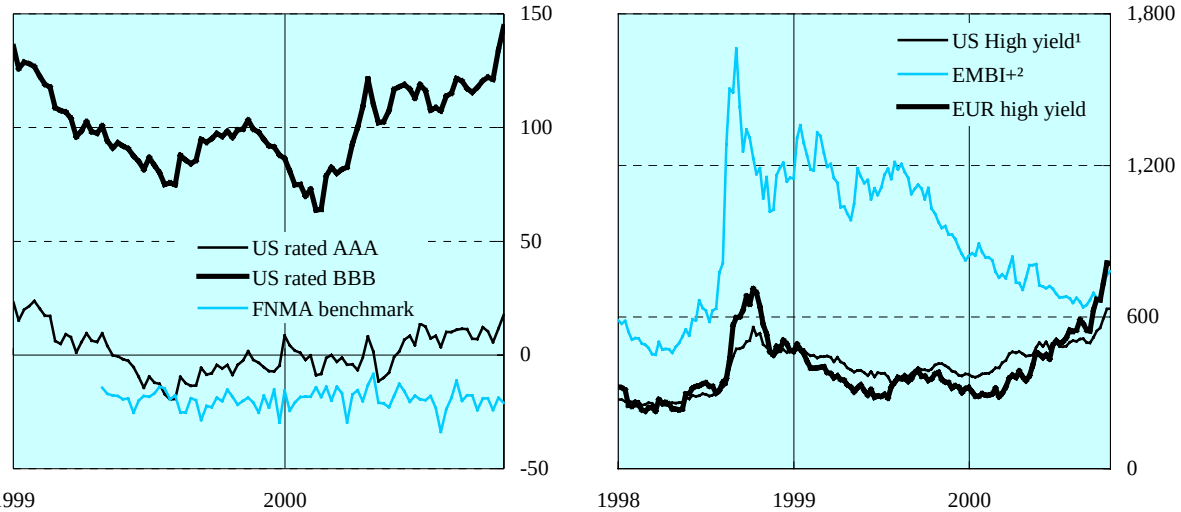
In October, Nasdaq prices fell by a further 8% as disappointing earnings announcements accumulated, mostly from technology firms. Despite the March-April correction, market valuations had in many cases continued to reflect extremely optimistic forecasts of future earnings growth. Thus, it was frequently the case that a company would report healthy current earnings growth but encounter a negative market response because it did not offer a sufficiently optimistic outlook for the future. The third quarter was also the second in a row to record a decline in the number of companies reporting earnings that exceeded forecasts (Graph I.2, right-hand panel). Because of the interconnected nature of the supply chain and the difficulties of forecasting future growth patterns in high-tech industries, reports of slower sales or investment growth in one sector often had a sharply negative impact on earnings forecasts for other sectors. Investors were also worried about the impact on corporate earnings of a potential growth slowdown in Europe, as well as about the effect of the weak euro on the income of those firms that had not adequately hedged their exposures to foreign exchange risk.

The downward revisions in revenue forecasts for high-tech companies and the accompanying decline in their stock prices led investors in East Asia to reduce their expectations about the prospects for the electronics industries based in that region. These expectations added to the woes of those Asian countries that depend heavily on electronics exports, some of which also happened to have stock markets already weakened by other factors. The Seoul market, for example, had suffered from a perception that efforts at financial and corporate reform were faltering, and the Taipei market from political problems. The Seoul market fell 25% in the third quarter and the Taipei market 23%. As the Nasdaq index continued to decline in October, the Seoul market fell a further 16% and the Taipei market a further 13%, that is, by even more than the Nasdaq index.

Graph I.3

Credit spreads over 10-year swap rates

Weekly averages, in basis points



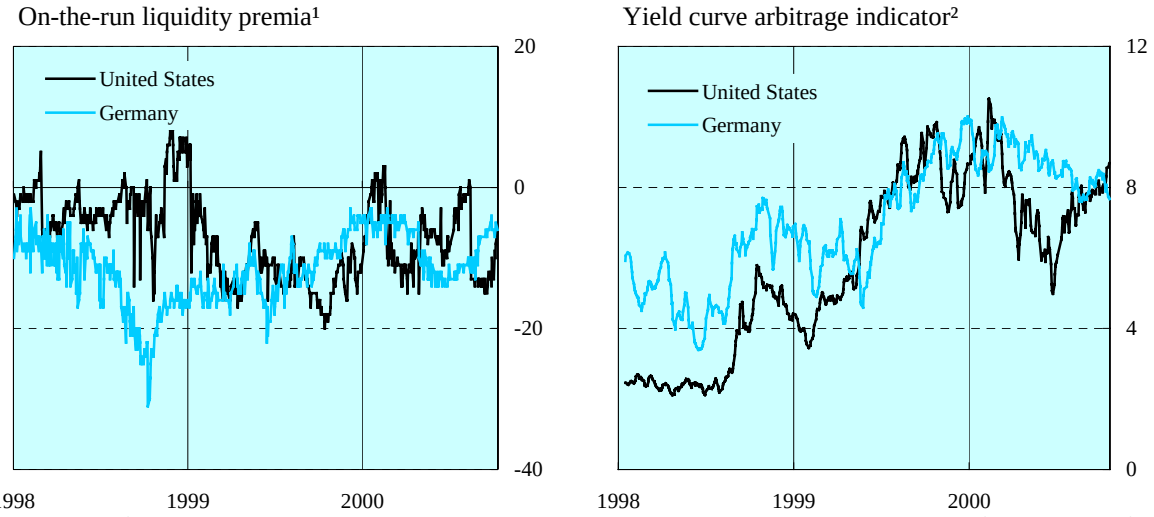
¹ Merrill Lynch US High Yield Master II. ² JP Morgan's Emerging Market Bond Index (EMBI+) spread over 10-year US swap rate. ³ Euro/ECU denominated Merrill Lynch high-yield bond index.

Sources: Bloomberg; Datastream, Moody's; national data.

Graph I.4

Liquidity in government bond markets

In basis points



¹ Static spread of the 10-year on-the-run government bond over a zero coupon yield curve. ² Standard deviation of static spreads of all bonds over a zero coupon yield curve (excluding callable bonds).

Sources: Datastream; BIS calculations.

Apprehension spills over into corporate bonds and emerging market debt

Concerns about the health of the corporate sector also resulted in wider corporate credit spreads (Graph I.3). The spread of the Merrill Lynch index of triple-A bond yields over 10-year US dollar swaps rose from virtually zero in early August to nearly 20 basis points in early October, while comparable triple-B spreads rose from 100 basis points to 140. The BBB spread had also widened in February and March, at a time when the market's attention was focused on the debt buyback strategies of the US Treasury and on the status of US agency paper, but this spread had then stabilised throughout the spring and early summer. Spreads on AAA issues had been more or less constant since autumn 1999. The renewed widening of spreads in the third quarter of 2000 may have reflected concerns about increased leverage, particularly in investment-intensive sectors such as telecommunications.[1] The higher spreads in the corporate bond market mirrored the tighter credit standards that, according to a survey by the Federal Reserve, have recently been imposed by bank lending officers in the United States. More generally, both volatile equity markets and higher credit spreads reflected increasing uncertainty over asset values.[2] Declines in the overall level of yields for government bonds in the United States and Europe reinforce the picture of a flight to safety among investors.

Sensitivity to credit risk also extended to emerging market debt. After narrowing steadily in the previous 12 months, spreads widened sharply in October. A tiering of risk in this market was evident in the fact that the most pronounced widening of spreads was experienced by such countries as Argentina, Brazil, the Philippines and Turkey, countries which had already been facing the widest spreads among the major borrowing countries in their respective regions. Emerging economies that are oil importers were also considered to be more vulnerable than the developed economies to higher oil prices. The problems experienced by the Argentine economy, which led to the announcement of a support package by the International Monetary Fund in November, may have contributed to a further

[1] See the box "Bond issues by European telecommunications companies" on pages 30-31.

[2] See the box "Credit spreads and equity market volatility" on pages 10-13.

worsening of sentiment towards emerging market debt in the fourth quarter. Nevertheless, as discussed below, capital markets continued to be fairly receptive to debt issues from the developing world for most of the third quarter.

Liquidity in fixed income markets stabilises

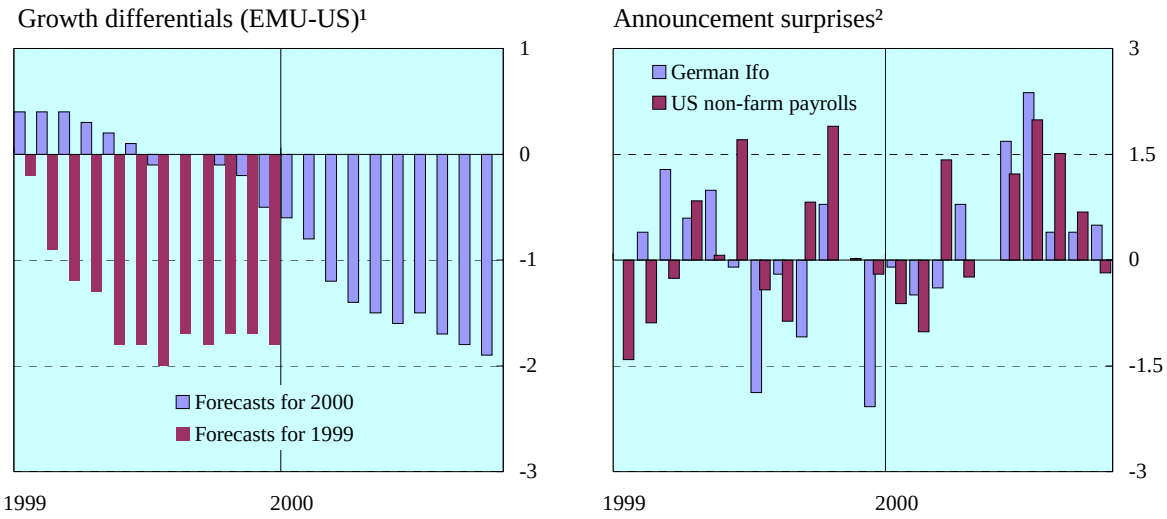
In contrast to earlier episodes of widening credit spreads, recent credit concerns about non-financial companies have not been associated with a decline in market liquidity or with worries about the health of the financial sector. The spreads of interest rate swap yields over those on government issues such as US Treasuries and German bunds were more or less unchanged over the period.[3] Other closely watched indicators of illiquidity, such as the spreads between on-the-run and off-the-run issues, have been stable or declining (Graph I.4). Stable swap and liquidity spreads are also a sign that, for the moment at least, fixed income markets have adapted to the declining supply of new government issues, after being preoccupied with this question for much of the first half of the year.[4] Another sign of the market's ability to adapt to the new supply conditions has been the fact that yields on 30-year bonds now once again exceed 10-year yields in the United States, after being below them for much of the year. The 30-year yield had been particularly affected by shifting market expectations regarding the path of future supply. At the same time, yields in the two- to 10-year section of the yield curve have fallen significantly below those at the very short end, reflecting downward revisions to the expected course of policy rates and producing an unusual U-shaped term structure.

The depreciating euro poses a quandary for markets and policymakers

During the period under review, the steady weakening of the euro against the US dollar and other currencies raised questions about prospects for price stability in the euro zone and about the market's

Graph I.5

Growth forecasts and economic surprises



¹ Difference between EMU area and US GDP forecasts. ² Actual less expected normalised by the standard deviation.

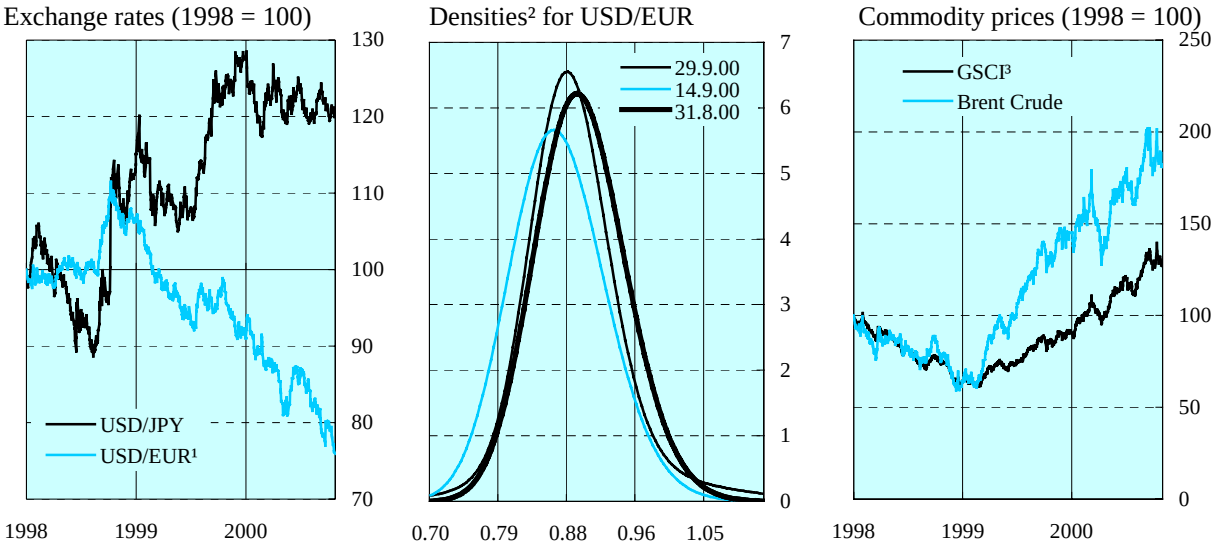
Sources: Bloomberg; Consensus Economics; national data.

[3] See the special feature "Market liquidity and stress: selected issues and policy implications" on pages 38-48 for a further discussion of the relationship between liquidity and credit risk.

[4] See the special feature "Size and liquidity of government bond markets" on pages 52-58 for a discussion of recent trends in government bond supply and their implications.

Graph I.6

Exchange rates and commodity prices



¹ Prior to 1999, the ECU. ² Risk-neutral probability density function estimated from three-month OTC option pricing. ³ Goldman Sachs Commodity Index.

Sources: Datastream; Reuters; BIS calculations.

confidence in the European economy. Discussion of causes of the euro's weakness has focused on the relative growth outlook across the developed economies and on the flow of capital into the United States. The recent bout of weakness was precipitated by the release in August of the closely watched Ifo survey of German business sentiment (Graph I.5). Similar surveys from other euro area countries and the September release of the Ifo survey continued to indicate sluggish economic prospects, while higher inflation figures raised the possibility of further tightening moves by the European Central Bank. More recent releases, such as industrial production data for various countries and the producers' confidence index from the European Commission, suggested a more mixed picture for Europe. Data for the US economy, such as preliminary figures suggesting annualised growth of 2.7% in the third quarter, also indicated a mild slowdown, but these were at first treated positively by financial markets since they supported the optimistic scenario of a "soft landing".

During 1999, some market observers cited the relatively high level of euro-denominated debt issuance as a factor contributing to the euro's weakness that year. Data for the third quarter of 2000 indicate that issuers have recently begun to revert to their earlier pattern of issuing in the stronger currency. In particular, as has tended to be the case in past periods of dollar strength, the share of dollar-denominated securities in international issuance was relatively high. This shift may in turn remove one of the factors that has been contributing to the euro's weakening trend.

While the euro's gradual depreciation during 1999 and the early part of 2000 had been seen by market participants as having helped to promote a needed recovery in European output, its more recent weakness against the other major currencies raised fears of rising euro zone inflation, a continued tightening of monetary policy by the ECB and an associated decline of confidence, with negative consequences for growth. After trading in a narrow range of 0.94-0.95 to the US dollar and 100-102 to the Japanese yen throughout June and July, the euro resumed its fall in late July (Graph I.6). By mid-September it had reached $0.85 and ¥90. Concerted intervention by the ECB, the Federal Reserve, the Bank of Japan, the Bank of Canada and the Bank of England on 22 September temporarily supported the euro at $0.87 and ¥95 up to early October. The probability distributions implied by risk reversal prices indicate that, after the intervention, short-run market expectations about the dollar/euro rate returned more or less to where they had stood at the end of August (Graph I.6). The euro continued to weaken during most of October, even against economically linked currencies

such as the Swiss franc and pound sterling, before recovering somewhat towards the end of the month accompanied by a new round of ECB intervention.

Ordinarily, rising interest rates in Europe might have been expected to support the euro, particularly when US rates have been flat or declining. While the ECB's summer tightening moves had already been priced into forward interest rates and thus did not lead to a revision of market expectations, the weakening US growth outlook led to a downward shift in the near-term path of forward US dollar rates. As of end-October, a neutral or slightly looser monetary policy stance by the Fed had been priced into the yield curve up to two years (Graph I.7). Nevertheless, and despite the decline in US equity prices since March, the promise of high returns in US equity markets appears to have continued to support the dollar.[5] The strong dollar has in turn been perceived as a positive factor for the US economy, in that it has helped to dampen inflationary pressures in conditions of strong domestic demand. Conversely, the weak euro has been seen to have exacerbated inflationary pressures and to have signalled waning market confidence regarding growth prospects in the euro area.

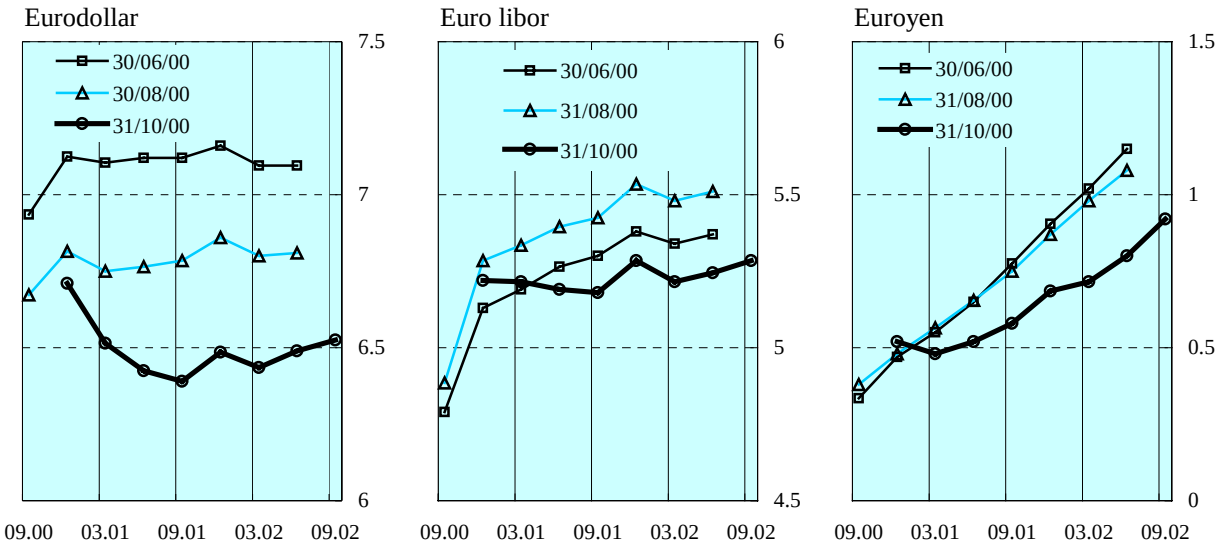
The Japanese yen has also strengthened against the euro, trading in a range of ¥105-110 to the dollar, with the help of data indicating 1.0% GDP growth in the second quarter and a rise in the Tankan business sentiment index in September. However, confidence in a strong Japanese recovery was restrained by the persistent weakness of the financial sector, which was further shaken by the failure of a large retailer in July and two insurance companies in October.

Rising oil prices add to nervousness

Another factor clouding the outlook for policymakers and market participants has been the 18-month long increase in crude oil prices (Graph I.6, right panel). In US dollar terms, most of the increase in oil

Graph I.7

Three month implied forward rates



Each curve shows the three-month implied forward rates for futures contracts commencing on the dates shown on the horizontal axis, as observed on the date listed in the legend. The forward rates are derived from interest rate deposit contracts of different maturities.

Source: Bloomberg.

[5] For a discussion of the interactions between stock market returns, equity flows and exchange rates, see Henri J Bernard and Gabriele E B Galati, "Special feature: The co-movement of US stock markets and the dollar" in the August 2000 issue of the *BIS Quarterly Review.*

prices had already occurred in 1999, with prices rising about two and a half times from January 1999 to March 2000, in line with stronger growth in the developed economies and the revival of demand from the emerging economies. While dollar prices fluctuated widely in the spring and summer of 2000, they returned to their March levels in August before rising again in the autumn as the situation in the Middle East worsened. For European countries, the weak euro has exacerbated the effect of the oil price increases. In euro terms, oil prices more than tripled from January 1999 to March 2000, and rose by an additional 25% between March and early October 2000. High ad valorem taxes on petrol in European countries have magnified the ultimate price impact for consumers. These factors may have accounted both for the wave of petrol-related strikes and protests in several European countries in September, and for the perception that the ECB may respond more aggressively to energy price inflation than the Fed. However, it is also widely recognised that oil represents a smaller fraction of consumption throughout the developed world today than it did at the time of the 1970s price shocks, so that the overall inflationary and growth impact is likely to be less pronounced.

Borrowers turn to convertible bonds, floating rate notes and syndicated loans

Apprehension in financial markets had an immediate impact on borrowers in the international securities market. Some firms postponed their borrowing plans, while others turned to ways of raising funds that were relatively less sensitive to rising credit spreads. Financial institutions, the largest group of borrowers, reduced their presence in the primary market, raising a net $115 billion in the third quarter of 2000, a 27% decline from the previous quarter. Net issuance by German financial institutions, in particular, declined significantly, because of the less favourable market conditions for euro-denominated paper. Among non-financial corporations, those lacking triple-A credit ratings found it increasingly difficult to raise funds from the securities market. Issuance by telecommunications firms, in particular, slowed down sharply in the third quarter, some of them turning instead to the syndicated loan market. To raise funds without paying the full credit spread on fixed rate securities, most of those telecom firms that did tap securities markets for large amounts issued bonds that would be exchangeable for equity. Other corporate issuers turned to floating rate structures.

The rise in credit spreads, however, did not lead to an aggregate decline in net issuance of international debt securities. Issuers raised a net $259 billion in the third quarter, almost as much as they had raised in the second. State agencies and government-sponsored enterprises largely made up for the reduced activity of other borrowers in the primary market. With the advantage of triple-A credit ratings, these agencies more than doubled their net debt issuance in the third quarter. In the United States, the Federal National Mortgage Association ("Fannie Mae") and the Federal Home Loan Mortgage Corporation ("Freddie Mac") launched over $50 billion of new international issues combined, accounting for the bulk of gross issuance by the agency sector during the quarter. With a view to offering alternative benchmarks to government securities, these agencies concentrated their issuance in large long-term, fixed rate issues.

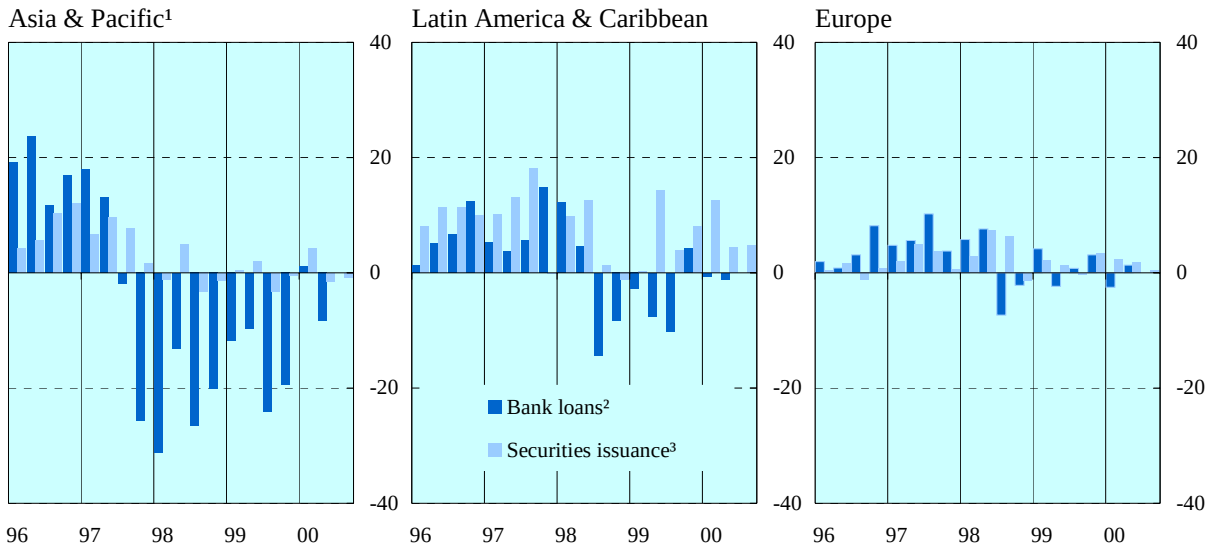
Developing countries for their part brought a moderate amount of new debt issues to market and engaged in debt exchanges, with the benefit of generally narrower sovereign spreads during the summer. These countries raised a net $8 billion from the securities market in the third quarter. Latin American issuers were especially active, while Asian and central and eastern European issuers stayed away from the primary market (Graph I.8). Some Latin American issuers floated eurobonds in order to buy back relatively more costly Brady bonds. In August, Brazil successfully issued some $5 billion of 40-year debt in exchange for an equivalent amount of Brady bonds. Other countries were said to be exploring similar exchange offers.

In contrast to the trend in securities issuance, bank lending to developing economies remained limited in the second quarter of 2000 (the most recent one for which comprehensive data are available), with claims on developing countries contracting by a relatively small amount. A small increase in claims on Latin American countries was not enough to offset continued repayments by Asian borrowers. However, the 1998-99 cycle of net repayments by developing countries appears to have ended, and

Graph I.8

International bank and securities financing in developing countries

In billions of US dollars



[1] Excluding Hong Kong and Singapore. [2] Exchange rate adjusted changes in cross-border loans of BIS reporting banks. Data on bank lending are not yet available for the third 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.

some countries, such as Mexico and Turkey, were able to borrow relatively significant amounts. As oil prices rose, oil-exporting countries increased their deposits with foreign banks, perhaps providing the liquidity for a further expansion of international lending in coming quarters.

More generally, as borrowers have shifted from bank loans to securities issuance in recent years, the cross-border activity of the world's major banks has increasingly taken the form of investment in debt securities and the extension of bridge loans rather than traditional direct lending. This was especially evident in the second quarter, when banks in the BIS reporting area purchased an estimated $129 billion of international debt securities. The banks have also accommodated the securities market by providing bridge loans to borrowers who subsequently refinance the loans by issuing long-term securities. Hence, a surge in international loan flows to non-bank borrowers in Europe during the first quarter was followed by a substantial increase in securities issuance in the second quarter. Evidence from the syndicated loan market shows that telecommunications firms were among the principal users of bridging finance in the first quarter, and that they stepped up their issuance of securities in the second quarter. In the third quarter, these borrowers found themselves in need of financing for national auctions of third-generation wireless licences, particularly in Germany, and for mergers and acquisitions. Faced with wide credit spreads in the securities market, telecommunications firms reduced their securities issuance and returned to the syndicated loan market.[6]

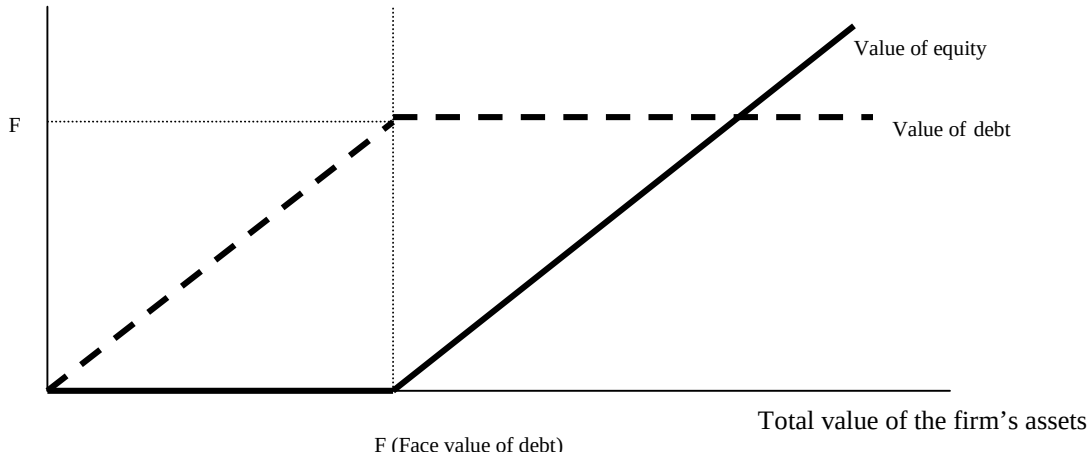
[6] See the box "Syndicated credits in the third quarter of 2000" on page 17.

Credit spreads and equity market volatility

Benjamin Cohen

In the previous issue of the *BIS Quarterly Review*, it was suggested that recent months have witnessed a strengthening of the link between credit spreads and the volatility of equity prices. Such a link would be predicted by a view of corporate capital structure that treats a firm's common shares as, in effect, a call option on the present value of cash flows deriving from the firm's assets, with a strike price equal to the face value of the firm's debt (Graph A). Correspondingly, the position of holders of the firm's debt can be thought of as a short put option, again with a strike price equal to the debt's face value. In line with standard option theory, the valuation of these options reflects uncertainty about the future value of the underlying assets. When this uncertainty increases, the value of the option increases, to the benefit of those, such as shareholders, with a long position and to the disadvantage of those, such as bondholders, with a short position.

A. Using option theory for corporate debt and equity valuation



An increase in the uncertainty of asset valuations should thus lead to a simultaneous increase in equity price volatility (because the shares represent a residual claim on the firm's assets), in credit spreads (corresponding to a decline in the market value of corporate debt) and in the level of equity prices (the value of the call option). This last effect, however, may be dampened or reversed by an increase in the risk premium required by the market for holding the shares.[①]

To what extent does this view of equity and debt valuation describe the actual behaviour of market prices? For most individual firms, testing this hypothesis is difficult. The lack of liquidity for the corporate bond issues of most individual firms means that prices may not always be available and may reflect temporary or idiosyncratic factors. For large companies with relatively widely traded bond issues, however, some comparisons can be made. Graph B compares the volatility of the common stock of General Motors and AT&T with the proportionate yield spread (the difference between the corporate yield and the government yield, divided by the government yield) on a bond issued by each of them. While there does not appear to be a direct relation between equity volatility and credit risk for either company, both variables did rise somewhat during 1999-2000. Certainly the *volatility* of the credit spread seems to be linked to equity volatility in both cases, confirming that uncertainty over asset valuations has a common effect on bond and equity price volatility.

Applying this theory to yield spreads and equity prices at the aggregate level can be problematic. For one thing, there is no guarantee that the population of firms represented in the index is the same as that of those whose issues are used to measure the corporate yield spread. Even if the indices represent the same population of firms, there is the risk of a fallacy of composition: it is possible that one group of firms could be experiencing unusually high equity volatility, while another group experiences wide credit spreads, creating the illusion of a linkage that does not reflect valuations at the firm level. Despite these limitations, visual inspection reveals that there have been periods, such as the early 1980s and late 1990s, when credit spreads and equity index volatilities in the United States, Germany and Japan have tended to move closely together (Graph C).

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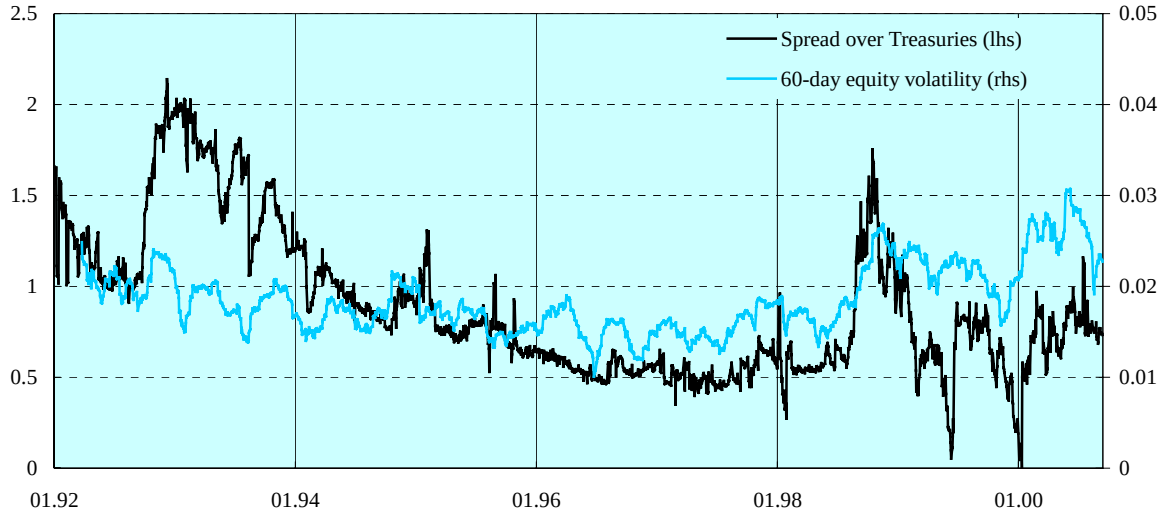
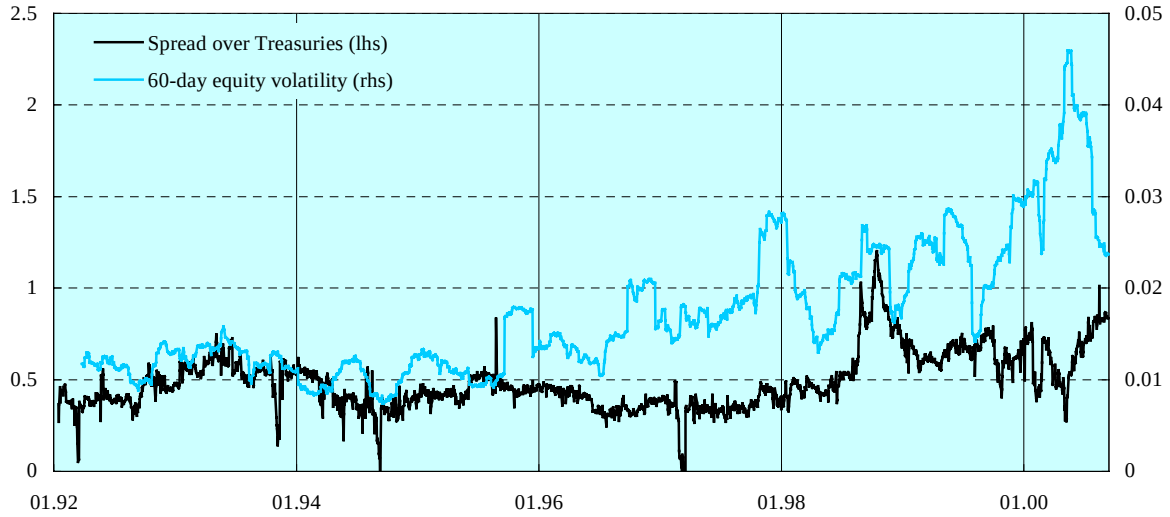
① For a more formal discussion of the options based approach to debt and equity valuation, see J Longstaff and E Schwartz (1995), "A simple approach to valuing risky fixed and floating rate debt", *Journal of Finance* 50:789-819.

B. GM: Credit spreads and equity volatility



AT&T: Credit spreads and equity volatility

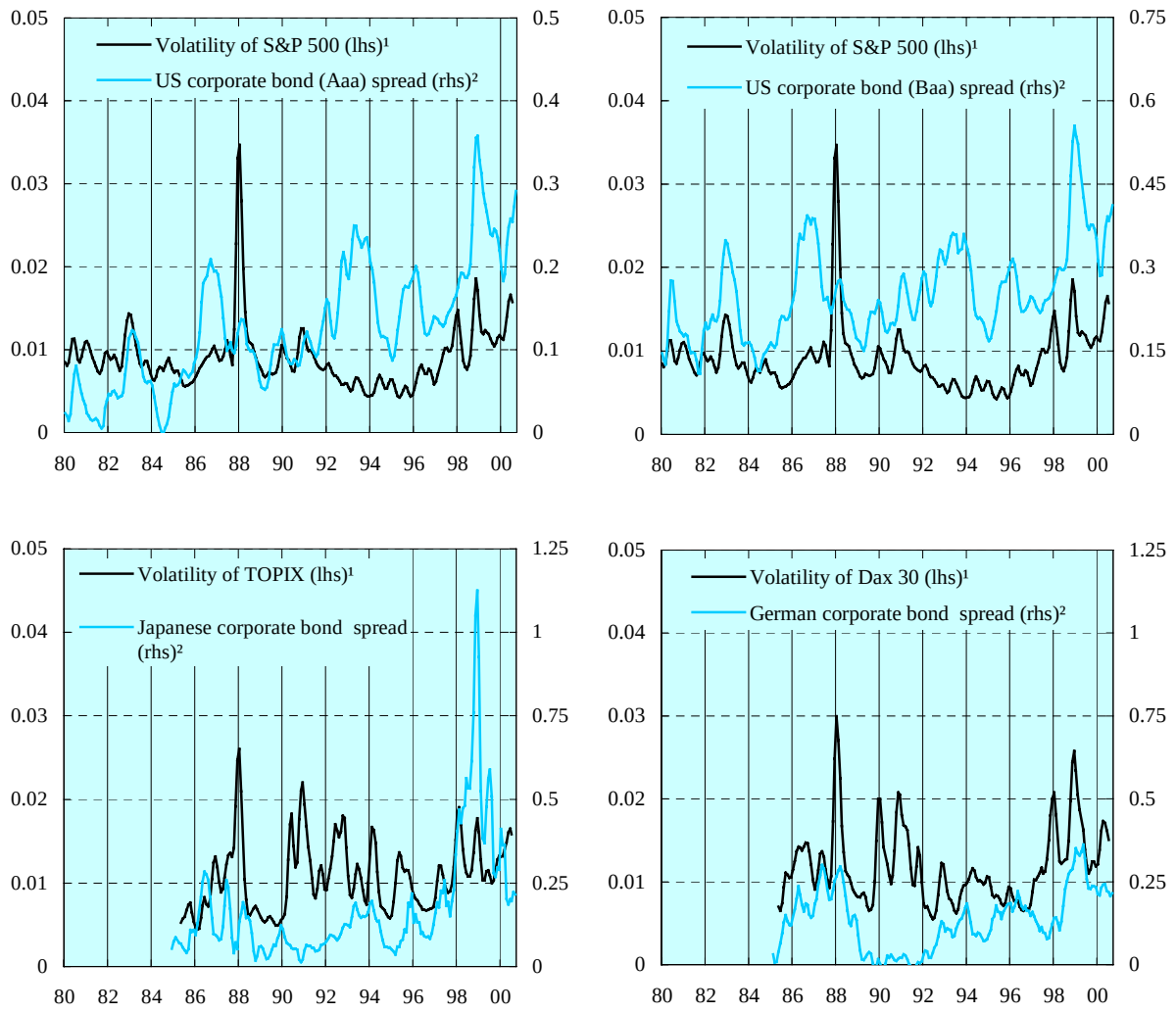


Note: "Credit spreads" are the difference in percentage points between a representative corporate bond from each company and the Bloomberg US Treasury yield index for comparable maturities (using interpolation among the 10-, five- and two-year yields), divided by the Treasury yield. Bonds used: for AT&T, 7 1/8% 10-year note due 15 January 2002; for GM, 9 1/8% 10-year note due 15 July 2001. "Equity volatility" is the rolling 60-day standard deviation of log changes in the daily closing price.

Sources: Bloomberg; BIS calculations.

Regression analysis confirms that this relationship appears to have become stronger in the last five years, and particularly in the current year (see the table). The table shows the impact of the standard deviation of the equity index during a given month on the average proportionate bond spread during the month. The model also includes the prevailing three-month interbank rate, as a proxy for the stance of monetary policy, and the change in the equity index over the previous two months, to correct for the possibility that the wider credit spreads merely reflect generally lower asset values rather than higher equity index volatility. The impact of equity volatility on the credit spread has tended to rise over time, and has become statistically significant for the period since 1996 for the AT&T bond shown in Graph B, for the Aaa and Baa spreads in the United States and for the Japanese corporate spread. For Japan, the effect is significant in 1996-99 but not in 2000. However, results for 2000 should be viewed with caution because of the limited number of monthly observations available for the current year. Another factor complicating interpretation of the more recent evidence is the increasing importance of supply factors in the determination of government bond yields, as a result of which credit spread changes have been heavily influenced by the market's evolving perceptions of relative liquidity conditions in corporate and government debt markets.

C. Proportionate corporate bond spreads and volatility of stock market indices



¹ 60-day rolling standard deviation of changes in the log prices of stock market indices. ² Difference between corporate and government yield (for the United States, 10-year bonds; for Japan, 12-year; for Germany, four-year); three-month moving average.

Sources: Datastream; national data.

Why might this relationship have become stronger in recent years? One possibility, as noted in the August 2000 issue of the *BIS Quarterly Review*, could be the more widespread use of risk management systems that explicitly take account of equity volatility in modelling corporate credit risk. This could in turn have an impact on the trading and lending decisions of the investors who use these models, which would be reflected in the observed behaviour of the credit spreads. Another factor in strengthening this relationship could be a decline in the risk premium demanded by equity market investors. Lower equity risk premia in recent years could reflect the greater diversification opportunities offered by vehicles such as mutual funds, as well as increased optimism about the long-term prospects for shares. The presence of such a premium in the past may have complicated the link between the option value of corporate equity and the option cost of corporate debt. For example, in the presence of a high equity risk premium, an increase in uncertainty about asset values might not have been translated as directly into higher equity price volatility as would be the case in the absence of such a premium, because equity price valuations already incorporated this possibility.

Coefficients from regressions of credit spreads on equity volatility

	1980-85	1986-90	1991-95	1996-99	2000[1]	Adj R^2
GM[2]			2.97*	2.63	2.46*	0.57
AT&T[2]			0.04	1.53**	1.16**	0.14
US Aaa	−1.05	0.07	0.31	5.43**	5.21**	0.69
US Baa	3.88	1.35	−1.10	5.61*	4.71**	0.45
Germany		1.10	1.95	0.24	2.73**	0.62
Japan		−0.04	−2.59	14.45**	6.33	0.39

[1] Up to September for GM and AT&T; up to June for US, German and Japanese spreads. [2] See notes to Graph B for the bond issues used.

Note: Each line of the table is derived from a regression of the monthly average of the proportionate credit spread (the corporate yield minus a corresponding government yield, divided by the government yield) on a constant, the monthly average three-month eurocurrency interest rate, the change in the average log equity price or index relative to two months previously, the standard deviation of the daily change in the log equity price or index during the month, and this standard deviation interacted with dummy variables for the time periods indicated in the first line. Credit spread and equity index variables are the same as in Graphs B and C. Equity volatility and price change observations for October 1987 were replaced by the averages of the corresponding observations for September and November 1987. A double asterisk (**) indicates that the coefficient is significant at a 95% confidence level, and a single asterisk (*) indicates significance at a 90% confidence level, using Newey-West standard errors.

Sources: Bloomberg; national data; BIS calculations.

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II. Highlights of international financing

1. The international banking market

International banking activity continued to expand in the second quarter of 2000, propelled by banks' substantial purchases of securities and the return of Japanese banks to the international banking market. The cross-border claims of banks in the reporting area increased by $110 billion, less than in the first quarter – when the rechannelling of funds through the interbank market to non-bank borrowers in Europe had resulted in an exceptionally large increase – but above average levels of activity in 1998 and 1999 (Table II.1.1). Flows from international banks remained by and large limited to borrowers in developed countries, with the United States replacing the euro area as the largest

Table II.1.1

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

In billions of US dollars

	1998	1999				2000		Stocks at end-June 2000
	Year	Year	Q2	Q3	Q4	Q1	Q2	
Claims on developed countries	**554.1**	**444.4**	**60.0**	**191.3**	**95.4**	**496.4**	**109.0**	**7,965.0**
of which: intra-euro 11	*296.7*	*252.1*	*35.0*	*84.7*	*– 1.3*	*107.2*	*– 12.9*	*1,558.0*
Interbank loans[2]	285.8	29.7	– 83.4	126.4	– 2.5	330.5	7.6	4,718.2
Loans to non-banks	21.5	100.6	67.2	2.4	25.3	51.9	– 9.9	1,373.2
Securities[3]	246.7	314.1	76.3	62.5	72.6	114.0	111.2	1,873.7
Claims on offshore centres	**– 204.9**	**– 104.8**	**– 44.7**	**– 26.4**	**35.3**	**– 48.7**	**6.4**	**1,166.8**
Interbank loans[2]	– 166.7	– 140.1	– 51.7	– 47.2	36.9	– 64.1	– 17.5	785.7
Loans to non-banks	– 26.7	7.1	1.0	12.6	– 9.3	1.5	13.5	239.7
Securities[3]	– 11.4	28.2	5.9	8.2	7.7	13.9	10.4	141.4
Claims on developing countries	**– 141.9**	**– 69.9**	**– 21.1**	**– 31.2**	**– 2.9**	**1.7**	**– 4.1**	**914.9**
Interbank loans[2]	– 63.6	– 58.6	– 20.4	– 22.5	– 4.5	6.0	– 8.7	363.1
Loans to non-banks	– 8.9	– 17.8	– 3.3	– 8.8	– 2.1	– 15.0	– 0.8	410.7
Securities[3]	– 69.4	6.5	2.6	0.1	3.6	10.8	5.4	141.0
Unallocated	**– 37.9**	**– 27.9**	**– 6.4**	**– 4.3**	**– 12.6**	**11.6**	**0.8**	**205.5**
Total	**173.2**	**245.6**	**– 11.4**	**129.7**	**115.8**	**461.2**	**109.6**	**10,252.2**
Interbank loans[2]	31.9	– 218.2	– 156.0	42.8	1.8	277.0	– 20.8	5,937.0
Loans to non-banks	– 26.7	86.5	62.2	8.7	22.7	41.8	1.2	2,058.8
Securities[3]	168.0	377.4	82.4	78.2	91.2	142.4	129.2	2,256.3
Memorandum item:								
Syndicated credits[4]	*902.0*	*957.1*	*271.1*	*264.3*	*249.2*	*268.2*	*330.0*	

[1] Exchange rate adjusted changes in amounts outstanding. [2] Including inter-office transactions. [3] Partly estimated. The data include other assets, which account for less than 5% of the total claims outstanding. [4] Announced new facilities.

recipient. Claims on offshore centres increased modestly in the second quarter, but claims on developing countries turned negative again, following the first period of inflows in nearly two years.

Even though net repayments by developing countries bottomed out in the final quarter of 1999, no clear upward trend in bank lending to developing countries has yet emerged. Claims on a select few, most notably Mexico and Turkey, continued to expand in the first half of 2000 however. Another notable development in the first half of the year was a sharp increase in deposit flows from developing countries to international banks, arising from an improvement in the external position of oil-exporting countries.

Interbank lending slows but purchases of bank securities remain near record levels

Interbank activity slowed sharply in the second quarter of 2000, as was to be expected following the extraordinary surge in lending to banks in the developed countries in the first quarter. To some extent, banks in the reporting area unwound the large interbank positions that they had built up during the first quarter, with funds moving from banking centres in the euro area to London and then being passed on to Tokyo, Zurich, the Bahamas and the Cayman Islands. Despite flows from banks in the United Kingdom to their branches in the Caribbean, reporting banks' claims vis-à-vis banks in offshore centres continued to decline in the second quarter. Most of the outflows from offshore centres arose from transactions by Japanese banks with their offices in Hong Kong, and by US banks with their offices in the Bahamas.

In contrast to interbank lending, banks' purchases of debt securities and other assets issued by banks reached near-record amounts. As a result, cross-border claims on banks increased by $53 billion in the second quarter. Banks in the reporting area have stepped up their investment in bank securities in recent quarters, purchasing $150 billion worth of such securities in the first half of 2000 compared to $189 billion worth in the whole of 1999.[7] In 1998-99, securities issued by banks in Europe had accounted for the bulk of banks' purchases, but, since mid-1999, purchases of US banks' securities have picked up. Of purchases of bank securities in the second quarter, nearly half was invested in securities issued by US banks. According to the consolidated banking statistics, Japanese and UK banks were responsible for most of the increase in reporting banks' claims on US banks.

Flows to US non-banks surpass those to euro area borrowers

Purchases of securities also accounted for most of the $57 billion rise in claims on non-bank borrowers in the second quarter. Bank lending to non-bank borrowers, which had showed signs of strengthening in the first quarter, dried up in the second. Lending to non-bank borrowers in Europe slowed especially sharply, reflecting in part the slower pace of syndicated lending to telecommunications companies.[8] More recent data on syndicated credits show a surge in lending to telecom firms in the third quarter, suggesting that direct lending to non-banks in Europe may have also recovered. Banks in the reporting area continued to purchase substantial amounts of securities issued by non-bank borrowers in Europe. Nevertheless, international bank flows to non-banks in the euro area more than halved in the second quarter, to $20 billion, and flows to UK non-banks virtually ceased (Graph II.1.1). Banks resident in the United Kingdom and the euro area, which had provided massive sums to non-bank borrowers in Europe in the first quarter of this year, were wholly responsible for the slower growth of claims in the second (Graph II.1.1).

Banks' cross-border claims on non-banks in the United States have increased since late 1999, and the increase in the second quarter even surpassed the rise in claims on euro area borrowers, who have

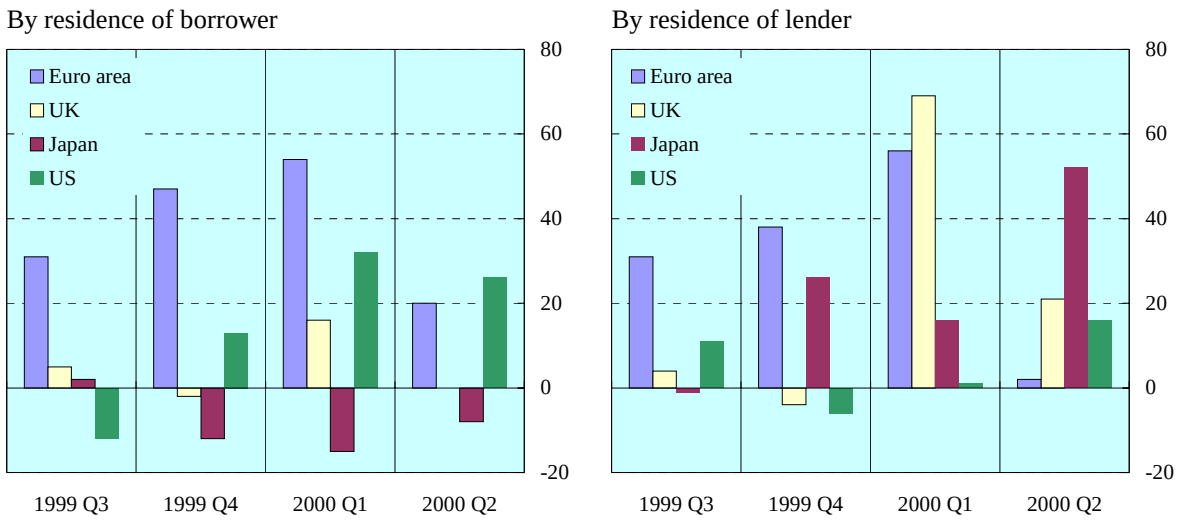
[7] The United States does not report banks' investment in securities.

[8] See the box "Syndicated credits in the third quarter of 2000" on page 17.

Graph II.1.1

Cross-border claims on non-banks[1]

In billions of US dollars



[1] Exchange rate adjusted changes in amounts outstanding.

historically been the largest non-bank recipients of international bank flows (Graph II.1.1). Flows from banks in the reporting area to US non-bank borrowers totalled $26 billion in the second quarter, four fifths of which took the form of purchases of securities. The locational banking statistics indicate that banks in the United Kingdom were the single largest source of international bank credit for non-banks in the United States in the first half of this year, but a substantial proportion of these funds were from euro area banks resident in the United Kingdom rather than UK banks. Based on the consolidated banking statistics, which are compiled on a nationality basis, euro area banks' claims on public sector and non-bank private sector borrowers in the United States increased by $44 billion in the first half of 2000, with German banks accounting for a little under half of this increase. UK banks' consolidated exposure to the US public and non-bank private sectors increased by $6 billion over the same period.

Japanese banks return to the international banking market

The slowdown in European banks' lending to non-bank borrowers in the second quarter was partially offset by renewed lending from Japanese banks. The cross-border claims of banks resident in Japan on non-bank borrowers increased by an exceptionally large $52 billion in the second quarter of this year, compared to $55 billion in the whole of 1999 (Graph II.1.1). The consolidated banking statistics show a similarly large increase in the cross-border exposure of Japanese banks in the second quarter: $87 billion, of which nearly half was related to claims on public sector and non-bank private sector borrowers.

The return of Japanese banks to international lending was especially evident in Europe. The claims of banks in Japan on non-bank borrowers resident in Europe increased by a record $27 billion in the second quarter, equalling the amount for the whole of 1999 and accounting for half of the total increase in Japanese banks' claims on non-banks. Notably, over two thirds of flows to Europe were denominated in yen. European telecommunications companies were responsible for a surge in yen issuance in the international debt securities market in the second quarter of 2000, to finance mergers,

Syndicated credits in the third quarter of 2000

Blaise Gadanecz

An exceptionally active second quarter in the international market for syndicated credits was followed by an almost equally active third quarter. A total of $324 billion worth of loans were arranged during the period, compared to $330 billion in the previous one. On a seasonally adjusted basis, the third quarter was even stronger than the second.

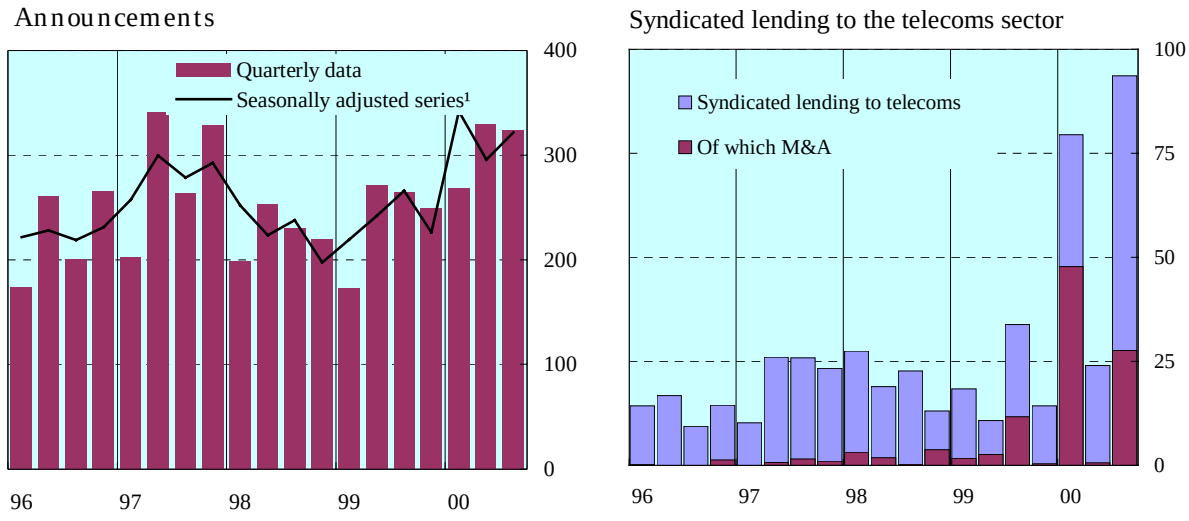
Activity related to mergers and acquisitions (M&As) and bridge loans for telecommunications firms contributed to the third quarter's strength. Deals to finance M&As and leveraged or management buyouts rebounded to $55 billion in the third quarter from $43 billion in the second. After slowing sharply in the second quarter, borrowing by European telecommunications firms picked up again in the third, particularly in the form of bridge loans, a temporary or supplementary means of funding before or while tapping securities markets. The largest borrowers in the syndicated loan market in the third quarter were all telecom firms: France Telecom (€30 billion), Vodafone Airtouch ($15 billion), KPN (€13 billion), Telecom Italia (€13 billion) and Telefónica de España (€8 billion).

International syndicated lending to telecommunications firms amounted to $197 billion in the first three quarters of 2000, more than double telecom financing for the whole of 1999 and nearly 25% of total syndicated credits signed in the first three quarters of this year. Facilities intended to support purchases of third-generation mobile phone licences accounted for at least 20% of telecom financing. Participation in syndicated facilities arranged for telecom firms was in line with historical market shares. US banks were the largest participants, providing approximately one quarter of telecom financing during the first three quarters of 2000, followed by German and UK banks, which each provided around 10% of funds. Despite a substantial increase in the cross-border claims of Japanese banks in the second quarter of 2000 (see page 16), there were few signs of an increase in their participation in the syndicated loan market.

Deals are becoming larger[①] and their maturities are becoming shorter. The average maturity of facilities has trended steadily downwards since 1992, falling from six years at the beginning of 1992 to three in the third quarter of 2000. There has, however, been much more volatility in the evolution of maturities for facilities used by borrowers in developed countries for M&A and buyout purposes.

Announced facilities in the international syndicated credit market

In billions of US dollars



¹ US Census Board X11 Arima seasonal adjustment process (multiplicative method).

Sources: Capital DATA; BIS.

① See the box "Syndicated credits in the second quarter of 2000" in the August 2000 issue of the *BIS Quarterly Review*.

acquisitions and purchases of third-generation mobile phone licences.[9] Some of these yen-denominated securities appear to have been purchased by Japanese banks.

In the United States too, banks in Japan were active lenders to non-banks. Their claims on US non-banks increased by a record $17 billion in the second quarter. In contrast to new claims on Europe, the bulk of bank flows from Japan to the United States were denominated in US dollars rather than yen. Banks in Japan purchased substantial amounts of US securities in the second quarter. In fact, according to the US Treasury International Capital reporting system, net purchases of US securities by Japanese investors (banks and non-banks) reached an all-time high of $27 billion in the second quarter, following two years of relatively modest purchases. The fact that the majority of purchases by Japanese residents were accounted for by banks, which would normally fund such purchases with US dollar deposits, provides a reminder that not all purchases of US securities support the dollar.

Japanese banks were also responsible for over one third of the $19 billion increase in reporting banks' claims on non-banks in offshore centres in the second quarter. As in the fourth quarter of 1999, Japanese banks sold loans to special purpose vehicles (SPVs) in the Cayman Islands, in their ongoing effort to restructure their balance sheets and improve their capital adequacy ratios. These SPVs then issued securities collateralised by these loans, most of which were purchased by Japanese investors, including banks in Japan.

Renewed lending by Japanese banks was funded in part through the international interbank market. Taking into account changes in both assets and liabilities, reporting banks moved upwards of $59 billion into banks in Japan in the second quarter, the largest increase in years. Further unwinding of "yen impact" loans, or yen funds channelled via Japanese banks' overseas offices to companies resident in Japan, accounted for roughly half of these inflows. Indeed, the ongoing reduction in Japanese banks' claims on their own offices abroad was responsible for much of the $24 billion contraction in reporting banks' claims on Hong Kong, as well as of the $8 billion reduction in reporting banks' claims on non-bank borrowers resident in Japan. Unlike in previous quarters, deposits and loans by foreign-owned banks, especially US and UK banks, in Japanese banks also increased. Japanese banks' access to the international interbank market has improved substantially since the early part of 1999, when the government took steps to recapitalise weak banks. The premium charged by international banks on loans to Japanese banks, the so-called "Japan premium", virtually disappeared in the first half of this year.

Claims on developing countries continue to contract

The expansion of international banking activity in the second quarter remained for the most part limited to developed countries, as it has been since early 1998. Banks in the reporting area reduced their claims on developing country borrowers by a further $4 billion in the second quarter (Table II.1.2). Claims on Asia fell the most, but claims on Africa and the Middle East, which had increased in 1997-99 even while credit to other developing countries was cut back, also declined.[10] Outflows of bank funds have fallen sharply since the end of 1999, totalling $2 billion in the first half of 2000 compared to $70 billion in 1999. But loan growth remained limited to a select few countries.

The small rebound in bank flows to Asia and the Pacific seen in the first quarter of this year – the first period of net credit to the region since mid-1997 – was not sustained in the second quarter. Bank claims fell by $7.3 billion, with every major Asian borrower except Korea experiencing a reduction in international credit. Chinese borrowers repaid $3.4 billion in loans, Thai borrowers $2.9 billion and Indonesian borrowers $1.1 billion. Total claims vis-à-vis Korea increased by $0.3 billion, but the small increase masks a significant shift in the sectoral composition of claims. Repayments by Korean banks

[9] See the August 2000 issue of the *BIS Quarterly Review*.

[10] See the box on "International bank and securities financing in Africa" at the end of this section.

Table II.1.2

Banks' claims on developing countries[1]

In billions of US dollars

	1998	1999				2000		Stocks at end-June 2000
	Year	Year	Q2	Q3	Q4	Q1	Q2	
Total claims	**–141.9**	**–69.9**	**–21.1**	**–31.2**	**– 2.9**	**1.7**	**– 4.1**	**914.9**
Africa & Middle East	21.5	0.1	– 3.7	2.2	5.3	– 6.3	– 1.0	153.0
Saudi Arabia	6.4	2.0	– 0.4	2.0	0.9	– 1.2	– 0.1	25.0
South Africa	– 0.6	– 0.8	– 0.0	– 1.5	– 0.7	– 0.3	– 0.5	17.3
Asia & Pacific	–156.8	–61.9	– 8.1	–24.4	–17.6	3.0	– 7.3	310.6
China	– 36.4	–17.1	– 0.4	– 7.3	– 5.7	0.1	– 3.4	63.2
Indonesia	– 17.3	– 7.3	– 2.1	– 3.7	– 1.1	– 1.9	– 1.1	42.9
Korea	– 45.9	– 5.1	– 0.2	– 1.3	– 5.8	5.9	0.3	75.7
Malaysia	– 8.3	– 4.1	– 0.8	– 1.5	– 1.5	0.3	0.0	20.2
Philippines	– 3.1	0.1	1.0	– 1.8	1.2	– 0.7	– 0.5	15.8
Thailand	– 37.6	–17.6	– 2.7	– 5.8	– 3.5	– 0.6	– 2.9	32.4
Europe	3.3	8.8	– 2.1	2.0	4.8	– 0.6	2.3	163.0
Hungary	2.2	1.1	– 0.1	0.1	0.6	0.2	0.2	13.0
Poland	3.5	4.6	0.1	2.1	0.6	– 0.4	0.3	16.0
Russia	– 6.1	– 6.5	– 1.5	– 1.7	– 1.4	– 1.4	– 1.4	39.9
Turkey	2.7	5.8	1.1	1.4	1.3	2.7	2.6	43.8
Latin America	– 9.9	–16.9	– 7.2	–11.0	4.5	5.5	2.0	288.2
Argentina	0.6	0.7	– 0.1	– 2.0	1.1	– 1.3	– 0.1	46.6
Brazil	– 10.3	– 8.9	– 3.2	– 3.3	3.9	1.4	0.0	88.0
Chile	– 0.5	– 1.7	– 0.8	– 1.0	– 0.2	0.8	– 0.3	18.8
Mexico	0.3	– 4.1	– 1.5	– 1.7	– 0.8	1.2	3.9	66.2

[1] Exchange rate adjusted changes in amounts outstanding.

to international banks in the second quarter exceeded new lending by $3.9 billion. At the same time financial institutions in the United States lent a record $4.8 billion to non-bank borrowers, with much of the lending collateralised by securities, ie reverse repos.

The BIS consolidated banking statistics show that since mid-1997 banks in the reporting area have drastically reduced their short-term claims on Asian borrowers. Claims with an original maturity of less than one year have fallen continuously over the past three years, while the amount of maturing long-term debt has remained relatively stable. The latest consolidated statistics indicate that the share of short-term funding in total bank claims on the Asia-Pacific region is picking up again, rising to nearly 48% at the end of June from a low of 46% a year earlier. But most of this increase reflects maturing long-term debt rather than an increase in financing with an original maturity of less than one year.[11]

Bank claims on Latin America and the Caribbean increased by $2 billion in the second quarter, the third consecutive quarter of inflows. Cross-border lending was directed mainly to Mexico, where total claims increased by $3.9 billion. Most of the inflows to Mexico in the second quarter were related to Spanish banks' acquisitions of local financial institutions. In Brazil, a decline in credit to the non-bank sector was offset by interbank flows. Total claims on Argentina contracted by $0.1 billion in the second quarter, owing principally to inter-office transactions. Excluding interbank activity, cross-border claims on Argentine borrowers actually increased in the second quarter, by $0.9 billion. Notably, international banks increased their holdings of securities issued by residents of Argentina at a time when spreads on Argentine debt widened sharply.

[11] See *BIS consolidated international banking statistics for end-June 2000*, 3 November 2000.

Developing countries in Europe, which received inflows of bank funds throughout the Asian, Russian and Brazilian crises, saw a $2.3 billion increase in cross-border claims in the second quarter. International banks reduced their claims on Russia by a further $1.4 billion, but lending to Turkey rose for the sixth consecutive quarter. The consolidated banking statistics show that cross-border bank financing in Turkey is increasingly short-term, with 60% of outstanding credit maturing in less than one year as of June 2000 compared to 56% a year earlier.

Deposits by developing countries soar

The ongoing contraction of bank credit to developing countries reflects in part weak demand for external financing. Despite strong growth in many countries, this year developing countries are expected to post their largest current account surplus in two decades.[12] The strengthening external position of oil-exporting countries is responsible for most of the improvement. As well as limiting external financing needs, this improvement contributed to a large increase in developing countries' deposits with foreign banks. In the first half of 2000, deposit flows from developing countries to international banks totalled $57 billion, nearly double the amount of deposits in the whole of 1999 (Table II.1.3).

Member countries of the Organization of the Petroleum Exporting Countries (OPEC) increased their deposits with international banks by $14 billion in the first half of 2000, compared to a negligible increase in 1999 and a drawdown of deposits in 1998. Iran, Kuwait, Libya, the United Arab Emirates and Venezuela accounted for most of the increase. Among non-OPEC oil-exporting countries, the largest increases in deposits were by Mexico and Russia, of $7 billion and $5.8 billion respectively. China, which is a large importer of oil but posts current account surpluses, deposited a record $22.4 billion in foreign currency with international banks in the first half of this year. Foreign currency

Table II.1.3

Developing country deposits with BIS reporting banks[1]

In billions of US dollars

	1998	1999				2000		Stocks at end-June 2000
	Year	Year	Q2	Q3	Q4	Q1	Q2	
Total deposits	**– 17.1**	**31.0**	**7.4**	**13.8**	**29.9**	**35.9**	**20.6**	**965.2**
Africa & Middle East	13.7	– 7.1	– 7.2	0.8	17.2	5.5	10.4	283.9
Iran	– 0.5	2.1	0.4	0.2	1.2	1.3	1.9	11.1
Saudi Arabia	13.3	–17.9	– 3.9	1.2	1.2	– 1.7	0.4	48.0
United Arab Emirates	2.3	– 9.2	– 3.9	– 0.5	1.7	1.3	2.0	43.9
Asia & Pacific	3.7	4.8	4.4	3.5	0.3	25.5	8.8	330.3
China	5.6	– 4.0	– 1.2	5.7	– 0.1	12.0	10.4	89.3
Europe	– 19.3	20.4	0.4	6.3	7.3	1.6	5.1	109.6
Russia	– 2.3	3.7	1.0	0.9	0.9	2.4	3.4	21.9
Latin America & Caribbean	– 15.2	12.9	9.7	3.2	5.1	3.4	– 3.8	241.5
Brazil	– 8.4	2.2	6.2	3.5	– 2.0	0.4	– 9.6	44.1
Mexico	0.3	4.1	0.6	1.8	0.0	3.5	3.5	54.3
Venezuela	2.5	0.1	0.9	– 0.4	1.0	1.4	1.1	28.8
Memorandum item: OPEC	*– 4.5*	*0.2*	*– 6.3*	*– 0.5*	*7.5*	*5.4*	*8.5*	*187.7*

[1] Exchange rate adjusted changes in amounts outstanding.

[12] See International Monetary Fund, *World Economic Outlook*, September 2000.

deposits in the Chinese banking system have been increasing rapidly, while foreign currency loans have not been showing much growth.[13] Chinese banks may have placed their surplus foreign exchange with international banks.

Asset managers in oil-exporting countries, as elsewhere, have become increasingly sophisticated, and the range of instruments in which surplus oil funds could be invested has broadened considerably over the past decade. Interestingly, Saudi Arabia reduced its deposits with international banks in the first half of 2000, suggesting that it used alternative channels to invest its growing current account surplus.[14] Owing to structural changes in asset management and capital markets, the international banking system's role in recycling petrodollars may not be as important today as it was in the 1970s.

[13] See the special feature "Foreign currency deposits of firms and individuals with banks in China" in the August 2000 issue of the *BIS Quarterly Review* for a discussion of the growth of foreign currency deposits in the Chinese banking system.

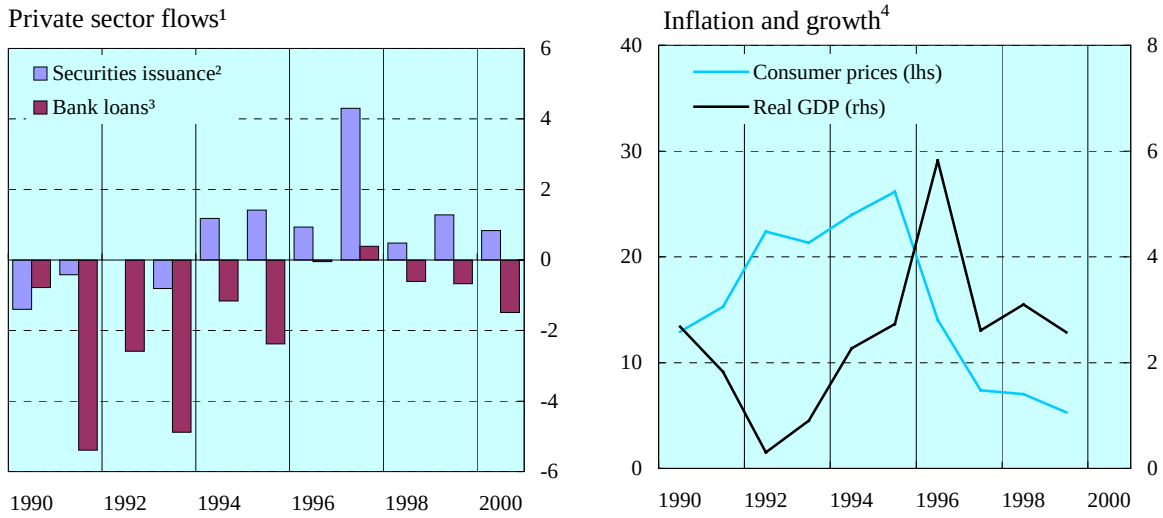
[14] The figures reported in Table II.1.3 possibly misstate the extent to which Saudi Arabia and other OPEC countries recycled their petrodollars through the international banking system since the United States does not provide a full country breakdown of its deposit liabilities.

International bank and securities financing in Africa

Elmar B Koch and Philip Wooldridge

Improvements in Africa's macroeconomic performance and prospects have in recent years led to a modest turnaround in private capital flows to the continent (see the graph). Privatisation, financial sector reforms and macroeconomic stabilisation programmes contributed to an increase in international investment beginning in the mid-1990s. Foreign direct investment accounted for the bulk of the increase, rising to $9 billion in 1999 from less than $2 billion annually during the first half of the 1990s. Securities financing also picked up, exceeding $1 billion in most years since 1994. Bank lending has yet to turn positive, but net repayments to banks in the BIS reporting area slowed substantially in the late 1990s.

Private sector flows, inflation and growth in Africa



[1] In billions of US dollars. Data for 2000 refer only to the first two quarters. [2] Gross issues minus repayments. Data include money market instruments and long-term bonds and notes. [3] Exchange rate adjusted changes in cross-border bank loans. From 1990 to 1995, data include changes in banks' holdings of securities and other assets. [4] Annual percentage change.

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

The international financial crises of the late 1990s dampened bank and securities flows to Africa but, in contrast to Asia or Latin America, the crises did not result in a retrenchment across the board by foreign creditors. Bank lending to many smaller countries remained stable during the late 1990s, and even increased to Egypt, Morocco and several other countries (see the table). Nevertheless, owing to significant outflows from Algeria, where political uncertainty weighed heavily on investors, and South Africa, total bank lending turned negative in 1998 and 1999 following the first year of net inflows – $0.4 billion in 1997 – in over a decade. South Africa was able to refinance a portion of its bank outflows in capital markets; indeed, the country was the only African issuer active in the international debt securities market in 1998. Bond issuance by African borrowers in 1998 and 1999 was down substantially from 1997 levels, but issuance in 1997 had been abnormally high because of $3.4 billion raised by residents of Mauritius.

In the first half of 2000, net repayments to international banks accelerated sharply, with South Africa, Angola and Zimbabwe experiencing the largest cutbacks in lending. Banks in the reporting area also drastically reduced their claims on Liberia, the only offshore centre in Africa.[①] Political strife has racked Angola, Zimbabwe and countries bordering Liberia for much of this year. Bank lending to Côte d'Ivoire increased in the first half of the year despite uncertainty about whether the government would meet payments due on its Brady bonds. In contrast to bank lending, securities issuance by African borrowers is on track to exceed 1999 levels.

Although Africa's economic and financial weaknesses might be expected to limit its access to longer-term debt finance from private creditors, in fact maturities are not unduly concentrated at the short end. The maturity distribution of bank claims is similar to that of other developing countries: as of June 2000, 53% of banks' claims

[①] Data for Liberia are not included in the graph or the table in this box.

on Africa matured within one year, compared to 47% in the Asia-Pacific region and 49% in Latin America (see the table). South Africa faces a heavy repayment schedule, with nearly two thirds of its international bank debts maturing within one year. Morocco and Algeria, the third and fourth largest bank debtors in Africa after South Africa and Egypt, have more favourable maturity profiles, with 32% of claims on them due within the next year. In the international debt securities market, African issuers tend to issue long-term bonds rather than money market instruments or other short-term securities. Nevertheless, issuers, especially those not regularly tapping markets, remain vulnerable to swings in market sentiment because payments tend to be bunched and the investor base for African securities is narrow.

As a result of strong trade and historical links, the bulk of lending and securities flows to Africa originate in Europe. The European Union accounts for nearly three quarters of total bank claims on Africa (see the table). France alone accounts for almost 30% of total claims, with French banks' exposure concentrated in Algeria, Morocco, Tunisia and the CFA franc zone. US banks are responsible for only 8% of all bank lending to Africa, of which more than half is to South Africa. The majority of outstanding bonds issued by African borrowers are denominated in US dollars, although South Africa is one of very few developing countries able to find a market for international debt securities issued in its own currency.

Bank credit to selected countries in Africa

	Locational banking statistics				**Consolidated banking statistics**			
	Loans[1]				**Banks' total claims**[2]	**Short-term claims**[3]	**Claims held by**[3]	
	1997	**1998**	**1999**	**2000 H1**			**EU banks**	**US banks**
Algeria	−2,054	−1,451	−1,148	− 242	5,110	32	79	5
Cameroon	− 25	− 74	80	204	2,022	69	99	0
Côte d'Ivoire	40	− 948	203	240	2,563	41	94	1
Egypt	628	1,138	97	446	7,222	57	66	8
Morocco	250	558	169	− 85	6,886	32	76	3
Nigeria	− 461	121	− 76	− 316	1,670	50	58	18
South Africa	1,295	− 608	− 959	− 849	18,739	63	55	15
Tunisia	331	80	215	− 138	2,855	41	78	4
Total Africa[4]	**392**	**− 611**	**− 676**	**−1,492**	**61,550**	**53**	**72**	**8**

[1] Exchange rate adjusted changes in cross-border bank loans, in millions of US dollars. [2] In millions of US dollars. Data include banks' holdings of debt securities and other assets. [3] As a percentage of total claims. [4] Excluding Liberia, which is grouped with offshore centres.

Notwithstanding the turnaround in private capital flows in the mid-1990s, Africa remains on the fringes of international banking and financial markets. The region accounts for approximately 7% of international banks' (consolidated) claims on developing countries, and only 3% of the outstanding stock of international bonds and notes issued by developing country borrowers. Loans and securities flows to Africa are highly concentrated in the larger and financially more developed countries of northern and southern Africa. Moreover, aside from South African borrowers, very few other African issuers are active in international capital markets. Political uncertainty (and the consequent risk of policy reversals), high debt levels, poor payment records and underdeveloped domestic financial systems are some of the obstacles to improved market access for many African countries.

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2. The international debt securities market

Despite rising credit spreads and turbulent equity and foreign exchange markets, net issuance of international debt securities in the third quarter of 2000, at $259 billion, was only slightly below that of the previous quarter (Table II.2.1). Even so, net issuance for the three quarters so far this year, at $798 billion, is 21% behind the pace for the same three quarters in 1999. Gross issuance of bonds and notes announced during these quarters was $1,393 billion (Table II.2.2), almost the same as the amount announced for the year-earlier period. The difference is that repayments have been higher this year, with 44% of the money raised offset by repayments, compared to 31% in 1999. Repayments have been distributed among the different categories of debt more or less in proportion to the amount

Table II.2.1

Main features of net issuance in international debt securities markets

In billions of US dollars

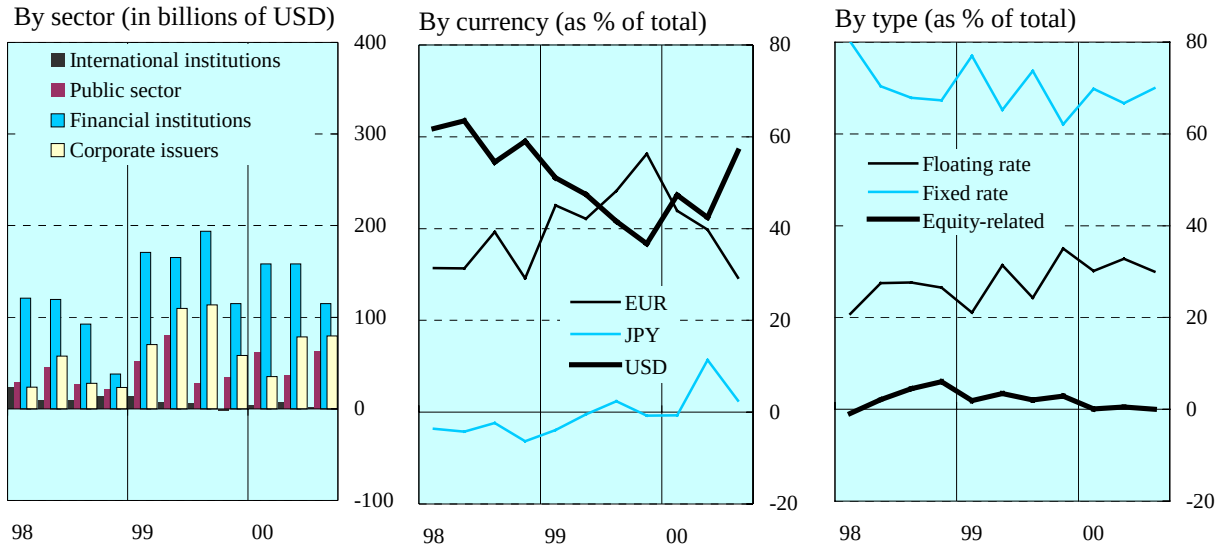
	1998	1999	1999		2000			Stocks at end-Sep 2000
	Year	Year	Q3	Q4	Q1	Q2	Q3	
Total net issues	**681.1**	**1,215.4**	**341.2**	**205.6**	**259.3**	**279.0**	**259.4**	**5,848.0**
Money market instruments[1]	10.1	66.4	22.6	17.3	1.2	24.4	14.4	285.5
Bonds and notes[1]	670.9	1,149.1	318.6	188.3	258.1	254.6	245.0	5,562.5
Floating rate issues	173.4	333.1	82.8	72.0	78.1	91.5	77.8	1,411.8
Straight fixed rate issues	491.7	851.2	251.5	127.7	181.0	186.1	181.5	4,212.0
Equity-related issues	16.0	31.1	7.0	5.9	0.2	1.4	0.1	224.3
Developed countries	573.5	1,136.3	330.7	191.5	232.4	266.1	242.0	4,957.0
Euro area	*211.5*	*490.8*	*137.1*	*93.4*	*114.4*	*138.8*	*116.9*	*1,954.0*
Japan	*– 17.4*	*2.7*	*6.9*	*– 6.7*	*– 13.2*	*– 2.7*	*– 11.7*	*295.6*
United States	*280.0*	*481.8*	*131.5*	*82.1*	*86.8*	*92.2*	*120.1*	*1,583.0*
Offshore centres	10.5	13.5	2.8	3.1	1.2	3.4	7.3	73.8
Developing countries	41.4	41.0	2.1	12.2	21.6	3.0	7.8	450.5
International institutions	55.7	24.7	5.7	– 1.3	4.1	6.4	2.2	366.7
US dollar	410.6	545.3	141.8	75.4	122.7	118.3	147.6	2,898.8
Euro[2]	223.8	570.8	164.4	115.7	113.8	110.9	76.1	1,653.4
Yen	– 26.8	– 7.2	8.1	– 1.6	– 1.7	31.8	6.5	543.9
Other currencies	73.5	106.4	26.9	15.9	24.5	18.0	29.1	751.9
Private sector	503.0	996.5	307.4	173.1	193.4	236.6	194.3	4,313.9
Financial institutions[3]	*370.7*	*644.8*	*193.7*	*114.9*	*158.2*	*158.1*	*114.8*	*2,838.0*
Corporate issuers	*132.3*	*351.7*	*113.6*	*58.2*	*35.2*	*78.5*	*79.6*	*1,475.9*
Public sector[4]	122.4	194.2	28.2	33.7	61.8	36.0	62.8	1,167.3
Central government	*36.4*	*36.0*	*– 3.1*	*10.7*	*14.5*	*10.1*	*2.6*	*463.2*
State agencies and other	*86.0*	*158.2*	*31.3*	*23.0*	*47.3*	*25.9*	*60.2*	*704.1*

[1] Excluding notes issued by non-residents in the domestic market. [2] For 1998, total of predecessor currencies. [3] Commercial banks and other financial institutions. [4] Excluding international institutions.

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

Graph II.2.1

Net issues of international debt securities by sector, currency and type



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

of gross issuance in those categories. In an effort to reduce borrowing costs and to take advantage of high volatility in the equity market, telecommunications firms issued bonds that could be exchanged for equity while other corporate issuers turned to the floating rate market. At the same time, US agencies took advantage of their high credit ratings to step up their issuance of long-term fixed rate debt.

Agencies issue heavily while other borrowers pull back

Among the various types of issuers, state agencies and government-sponsored enterprises seemed least affected by the widening of credit spreads in the third quarter. Armed with triple-A credit ratings, some of these borrowers more than doubled their net debt issuance in the quarter to $60 billion, matching their record pace of last year (Table II.2.1, Graph II.2.1[15]). The Federal National Mortgage Association ("Fannie Mae") announced over $30 billion of new issues, while the Federal Home Loan Mortgage Corporation ("Freddie Mac") announced over $20 billion. These two issuers accounted for 65% of gross issuance by the agency sector during the quarter.

With a view to providing alternative benchmarks to government securities, the agencies concentrated on offering very large, long-term, fixed rate issues. After floating $28 billion of fixed rate issues of at least $1 billion in size in the second quarter, they issued a total of $47 billion of such securities in the third. While most of their borrowing was denominated in US dollars, a €5 billion issue announced by Freddie Mac in September signalled that issuer's interest in expanding its presence in the euro-denominated market.

Financial institutions other than agencies accounted for $115 billion of net issuance in the third quarter, a 27% decline from the previous one. Net issuance by this sector during the three most recent quarters is 19% below that for the same period last year, conforming to the slower pace of issuance exhibited by the international securities market as a whole. Net issuance by German financial institutions, which have been important participants in these markets in recent years, declined from $45 billion in the second quarter to $28 billion in the third, in part because of the less favourable

[15] The figures in Graph II.2.1 differ slightly from those in Table II.2.1 because the former only refer to international bonds and notes (ie. long-term securities) while the latter incorporates data on short-term securities as well.

market conditions for euro-denominated paper. DePfa, an important issuer of Pfandbriefe, decided to postpone issuance of a much heralded €1 billion issue in September because of the impact of concerns over inflation on the euro yield curve.

Non-financial corporations maintained their pace of primary market activity even as credit spreads widened and some large companies suffered from ratings downgrades.[16] These firms raised a net $80 billion in the third quarter, slightly more than in the second. However, corporate financing activity over the first three quarters remained 34% behind that for the same period last year, as borrowers lacking triple-A ratings began to find it more costly to raise funds in the bond market (Graph II.2.2). Issuance by telecommunications firms, in particular, slowed down sharply in the third quarter relative to the second. In the face of wide credit spreads, some of the firms turned to the syndicated loan market instead. Other corporations, particularly those involved in M&A activity, made up for the decline in telecoms issuance. The biggest corporate borrower in the quarter was Unilever, which issued $7.6 billion of bonds and notes to finance its acquisition of Bestfoods.

Telecommunications firms as a group issued $23 billion in the third quarter, less than half the amount they had in the second (Table II.2.2). The largest flotations from this group were $3 billion by Hutchison Whampoa, $5.9 billion in four tranches by Telefónica Europe, €2.5 billion by Siemens Nederland and €2.5 billion by Tecnost. All of these were dwarfed by Deutsche Telekom's nearly

Table II.2.2

Gross issuance in the international bond and note markets

In billions of US dollars

	1998	1999	1999		2000		
	Year	Year	Q3	Q4	Q1	Q2	Q3
Total announced issues	**1,186.4**	**1,768.5**	**463.8**	**352.3**	**469.5**	**450.7**	**472.9**
Floating rate issues	292.5	484.9	124.2	102.2	125.5	143.6	161.7
Straight fixed rate issues	846.9	1,231.5	331.9	237.5	332.3	297.5	296.5
Equity-related issues[1]	47.1	52.1	7.7	12.6	11.6	9.6	14.7
US dollar	603.0	775.4	200.0	132.0	197.6	183.1	215.1
Euro[2]	335.3	676.5	178.2	139.5	169.6	146.3	147.7
Yen	75.2	118.9	37.5	36.7	48.6	75.6	49.0
Other currencies	173.0	197.7	48.0	44.2	53.7	45.7	61.1
Private sector	857.3	1,373.3	379.4	279.7	352.8	365.8	358.9
Financial institutions[3]	*596.1*	*896.8*	*242.1*	*184.7*	*261.2*	*229.6*	*235.6*
Corporate issuers	*261.2*	*476.5*	*137.4*	*95.0*	*91.6*	*136.1*	*123.3*
of which: telecoms	*33.6*	*84.3*	*16.2*	*15.7*	*24.4*	*46.7*	*22.9*
Public sector	227.7	317.4	66.6	57.7	97.0	64.9	99.1
Central government	*96.9*	*94.2*	*17.3*	*17.1*	*27.3*	*16.2*	*18.4*
State agencies and other	*130.8*	*223.3*	*49.3*	*40.6*	*69.7*	*48.7*	*80.7*
International institutions	101.4	77.8	17.7	14.9	19.7	20.1	14.9
Completed issues	**1,190.5**	**1,773.0**	**461.0**	**387.1**	**447.2**	**443.9**	**460.4**
Repayments	**519.6**	**623.9**	**142.4**	**198.8**	**189.1**	**189.4**	**215.4**

[1] Convertible bonds and bonds with equity warrants. [2] For 1998, total of predecessor currencies. [3] Commercial banks and other financial institutions.

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

[16] See the box "Bond issues by European telecommunications companies" on pages 30-31.

Table II.2.3

Net issuance of international debt securities by currency and region[1]

In billions of US dollars

		1998[2]	1999	1999		2000		
		Year	Year	Q3	Q4	Q1	Q2	Q3
Europe[3]	US dollar	77.5	55.4	11.8	0.4	33.0	36.0	39.4
	Euro	170.6	487.9	142.0	99.0	100.1	97.2	63.6
	Yen	– 9.1	6.2	7.9	2.5	3.6	31.1	7.5
	Other currencies	42.0	77.7	20.5	12.0	19.5	14.6	21.9
North America[4]	US dollar	262.1	435.4	117.8	72.9	68.4	71.4	102.6
	Euro	32.6	45.6	14.2	7.4	8.9	8.7	10.7
	Yen	– 4.1	– 1.3	0.7	0.3	5.2	4.6	2.5
	Other currencies	14.6	15.1	1.8	2.5	2.3	0.8	3.3
Others	US dollar	71.0	54.5	12.2	2.1	21.3	10.9	5.6
	Euro	20.6	37.3	8.3	9.3	4.7	5.0	1.9
	Yen	– 13.7	– 12.1	– 0.5	– 4.3	– 10.5	– 3.8	– 3.5
	Other currencies	16.9	13.6	4.6	1.4	2.6	2.5	3.8
Total	US dollar	410.6	545.3	141.8	75.4	122.7	118.3	147.6
	Euro	223.8	570.8	164.4	115.7	113.8	110.9	76.1
	Yen	– 26.8	– 7.2	8.1	– 1.6	– 1.7	31.8	6.5
	Other currencies	73.5	106.4	26.9	15.9	24.5	18.0	29.1

[1] Based on the nationality of the borrower. [2] For the euro, total of predecessor currencies. [3] European Union countries, Iceland, Liechtenstein, Norway and Switzerland. [4] Canada and United States.

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

$17 billion of bond and note issues during the second quarter. A credit downgrade of Deutsche Telekom's bonds in July and subsequent volatility in credit spreads dissuaded other telecommunications firms from following the German firm's lead in the fixed rate primary market. As explained in the box "Bond issues by European telecommunications companies" on pages 30-31, such spreads reflected the perceived risks resulting from their increased leverage and the fact that they are undertaking large-scale investments in new technologies.

The strong US dollar attracts increased issuance

Net issuance in the US dollar rose to $148 billion in the third quarter, a 25% increase over the previous quarter, while that in the euro fell to $76 billion, a 31% decline. This marks a return to a long-standing pattern in the international debt securities markets, whereby borrowers tend to issue in relatively strong or strengthening currencies. For example, in 1995, when the US dollar was at record lows against several currencies, only 26% of net issuance was in dollars, while by 1998, after several years of dollar appreciation, net issuance in dollars had grown to 60% of the total. In 1999, however, net issuance in euros exceeded that in US dollars despite the euro's weakening trend, constituting a departure from the usual pattern. This may have been due to a desire by large issuers to "establish a presence" in the market for bonds denominated in the new currency. During 2000, and particularly in the third quarter, borrowers reverted to their former tendency; dollar-denominated net issuance was 57% of the third quarter total.

The strength of issuance in the US dollar only partly reflected the fact that US issuers were more active overall. While the tendency to issue in their home currency remained strong for North American borrowers, the tendency for European borrowers to issue in euros has weakened. In the third quarter, North American borrowers raised 86% of their funds in dollars, the same proportion as the average for the six quarters since the introduction of the euro (Table II.2.3). In contrast, the third quarter saw European borrowers raising only 48% of their funds in euros, compared to 71% during the six

preceding quarters. Europeans instead used the dollar for 30% of their net issuance, after six quarters when it accounted for only 13% of their net financing. One reason for the increased dollar issuance by Europeans issuers was the large number of European acquisitions of US companies in the quarter, such as Unilever's acquisition of Bestfoods for $20 billion.

Despite the rise in dollar issuance by Europeans, most of the large issuers in dollars continued to be companies based in the United States, particularly Fannie Mae, Freddie Mac, Ford Motor Credit and Morgan Stanley Dean Witter. Similarly, the largest issuers in euros were European firms, such as Siemens Nederland and Tecnost International, both based in the Netherlands and each one issuing €2.5 billion. German banks remained faithful to the euro, including Deutsche Hypothekenbank for €3 billion, Württembergische Hypothekenbank for €2 billion and Allgemeine Hypothekenbank for €2 billion. Among large European issuers borrowing in dollars were Telefónica of Spain ($5 billion in three tranches) and KPN of the Netherlands ($3.5 billion in three tranches). Outside Europe, Hutchison Whampoa of Hong Kong went to the dollar market for its $3 billion issue as did Celestica, a Canadian electronics engineering firm, for a $1.8 billion high-yield convertible bond.

Activity in the yen continued to show signs of revival, after two consecutive years of negative net issuance, with $6.5 billion in the third quarter following $31.8 billion in the second. While borrowing in this market in the second quarter was dominated by global telecommunications firms, the most prominent issuers in the third quarter were financial institutions, including Citigroup, which announced ¥175 billion in three tranches, and Deutsche Ausgleichsbank with a ¥100 billion issue. Borrowers from the developing world, including the Republic of Argentina (¥61.5 billion), the Brazilian bank BNDES (¥40 billion) and the Pohang Iron and Steel Company of Korea (¥35 billion) were also active in the Samurai market.

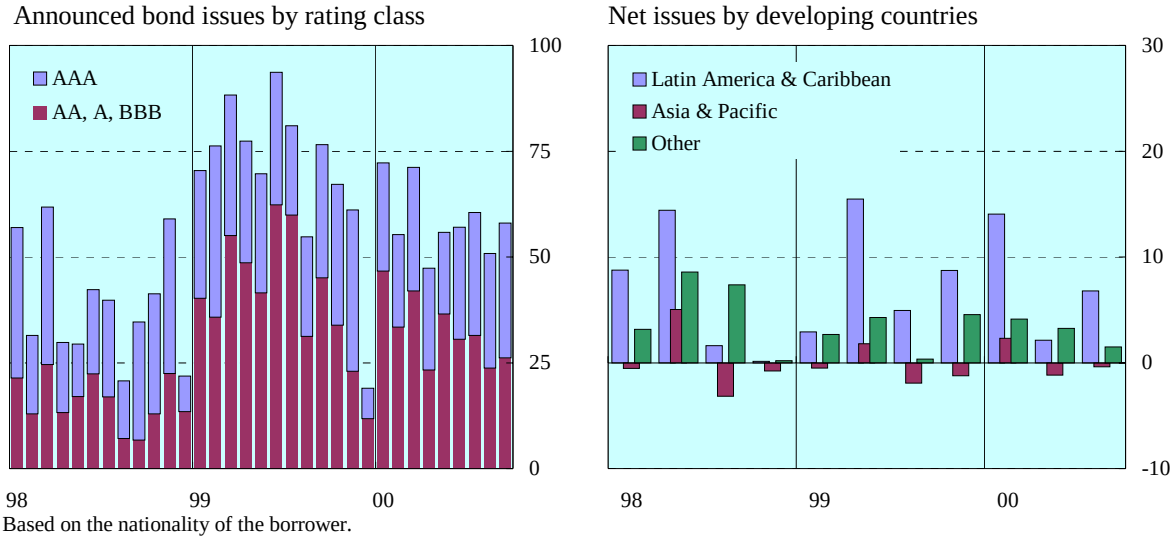
Floating rate issuance continues to grow

While the share of floating rate structures in total issuance declined in the third quarter relative to the second, such issuance over the first three quarters of 2000 continued to be relatively more prominent than during the comparable period of 1999. During the first three quarters of 2000, net issuance of

Graph II.2.2

International bond and note issuance [1]

In billions of US dollars



[1] Based on the nationality of the borrower.

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

floating rate instruments amounted to $247 billion, or 5% less than issuance in the same period last year (Table II.2.1). In the case of fixed rate debt, net issuance of $182 billion in the third quarter and similar amounts in the two earlier quarters represented a 24% drop relative to 1999. The uncertain inflation and credit environment during most of the period may have contributed to borrowers' continued preference for floating rate obligations, especially corporations without triple-A ratings. In the third quarter, for example, A/A1 rated Unilever turned to the floating rate market for its $6 billion and €1.5 billion issues, as did A/A2 rated Ford Motor Credit for its $2 billion issue.

Some corporations facing wide credit spreads attempted to reduce their borrowing costs without immediately diluting their already weak equity values by issuing convertible bonds. Volatile equity markets, by increasing the value to investors of the conversion option, reduced the direct cost to borrowers of issuing these bonds and thus helped to compensate for the increase in credit spreads. Telecommunications firms in particular, including such borrowers as Hutchison Whampoa, Siemens Nederland and Tecnost, took advantage of these conditions by issuing large amounts of convertible debt. However, while new equity-related securities issuance approached nearly $15 billion in gross terms, the highest amount since the second quarter of 1999, a high level of repayments, early redemptions and conversions meant that net issuance was virtually flat during the quarter.

Activity by US government-sponsored agencies in the third quarter was an important exception to the shift from fixed to floating rate issuance exhibited by other borrowers. For issues of at least $1 billion in size, these agencies arranged more than four times as much fixed rate as floating rate issuance (consistent with their benchmark objectives), while for the market as whole the ratio was less than 3:1.

Developing countries concentrate on debt exchanges

While international debt issuance by developed country borrowers appeared to be slowing, issuance by developing countries remained close to last year's pace through the third quarter (Graph II.2.2). Developing countries raised a net $7.8 billion from the international debt securities market in the third quarter. Net issuance by developing countries for the first three quarters totalled $32.4 billion, slightly more than the $28.8 billion for the corresponding period in 1999. Latin American issuers were especially active in the third quarter, particularly Argentina ($2.2 billion), Brazil ($1.4 billion) and Mexico ($2.1 billion). Brazil's ability to access international capital markets was further demonstrated by the successful sale of $4 billion of shares in the state-run oil company Petrobras on the New York Stock Exchange in August. Asian and eastern European issuers continue to be relatively inactive, and focused on buying back or refinancing existing debt.

Developing country debt issuance benefited from a generally narrowing trend in sovereign spreads through August. These spreads started to rise in September before widening sharply in October, which may portend a slowdown in the current pace of issuance in the fourth quarter (Graph I.3 in the Overview). Argentina, Brazil and Mexico announced eurobond issues in July, before secondary market spreads on emerging market debt started to widen. Besides issuing new debt, Latin American borrowers also took advantage of benign market conditions to exchange Brady bonds for less expensive, longer maturity eurobond issues. Brazil successfully issued some $5 billion of 40-year debt in exchange for an equivalent amount of Brady bonds in August. Other countries were said to be exploring similar exchange offers.

Bond issues by European telecommunications companies

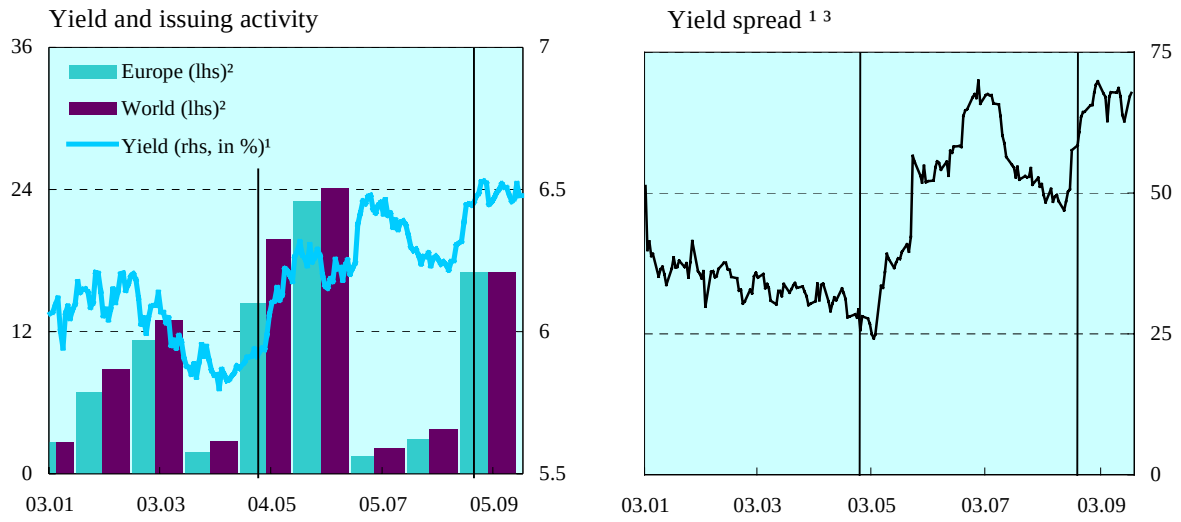
Dietrich Domanski

Telecommunications companies have issued unprecedented amounts in the international debt securities market in recent months. These issues totalled $94 billion from January to September, with the bulk occurring in May, June and September (left-hand panel of the graph). This was equivalent to 27% of international gross issuance of corporate debt securities worldwide in the first three quarters of 2000. European firms accounted for 85% of all telecom issues. The European telecommunications sector faces very large financing requirements as a result of takeover activity and, even more importantly, the purchase of third-generation mobile phone licences. These licences were auctioned in the first three quarters of this year in the United Kingdom, the Netherlands and Germany, with bids amounting to €38.6 billion (or 2.5% of GDP), €2.7 billion (0.6% of GDP) and €50.8 billion (2.6% of GDP) respectively.

The yields on European telecommunications bonds and the spreads against swap rates have increased significantly since May. In the autumn, the average yield on euro-denominated bonds issued by Aa2-rated companies (Deutsche Telekom, France Telecom and KPN) with a residual maturity of approximately eight years was 70 basis points above swap rates, compared to 30-35 basis points in the spring. Spreads have also doubled relative to US telecommunications bonds (from about 15 to 30 basis points). Spreads of bonds issued by other large companies such as British Telecom and Telefónica followed the same pattern (although they are not fully comparable owing to differences in rating and maturity). Spreads widened in two "waves", the first increase following the auction of third-generation mobile phone licences in the United Kingdom in April, and the second immediately after the German auction in August (right-hand panel of the graph).

The wider spreads suggest that market participants believe that the credit risk of European telecommunications companies is now substantially higher than a couple of months ago. The pattern of spreads across issuers reflects two main factors. First, many telecommunications companies have become more vulnerable to shocks because their leverage has increased sharply. In the first half of 2000, the debt to equity ratio for the Aa2-rated companies considered here jumped from 110% to almost 145%. The widening of spreads in May when a first batch of telecom bonds was issued partly reflects this. The leverage of telecommunications firms increased further in the second half of 2000, as the funds required to pay for the German licences were to a large extent raised in the syndicated loan market and subsequently refinanced by bonds. Since investments in third-generation mobile phone infrastructure have yet to be financed, funding needs are expected to remain high.

Telecommunications bonds in Europe



Note: The vertical lines indicate the end of the third-generation mobile phone licence auctions in the United Kingdom (27 April) and Germany (18 August).

¹ Unweighted average of the yield on bonds issued by Aa2-rated telecommunications companies with a residual maturity of seven to eight years. ² International bond issues in billions of US dollars. ³ Against euro Libor swap rates, in basis points.

Sources: Bloomberg; Capital DATA; Datastream.

Second, the wider spreads may indicate a changing perception of the risks that telecommunications companies are exposed to in undertaking large-scale investments in new technologies. As providers of the information technology infrastructure, they face the same types of hazards and risks as other "new economy" firms. Such firms are at a very early stage of the product cycle, investing in markets that are perceived to have a high growth potential with considerably higher expected long-run earnings than those in the "old economy". At the same time, these earnings prospects are subject to considerable uncertainty. Rapid technological progress may quickly depreciate the capital stock; innovation in information technology may further reduce barriers to market entry and affect competition in unforeseeable ways; and the demand for many products based on new technologies is only surmised. Together, the risks that telecommunications firms are taking with these investments appear significantly larger than those of "traditional" infrastructure providers operating in more established markets. Against this background, the Financial Stability Forum and national regulatory bodies have expressed concerns that the large-scale borrowing by telecommunications firms might excessively expose the financial system to these risks.

The uncertainties associated with the huge investments in new technologies are also highlighted by the jump in spreads immediately after the German auction (right-hand panel of the graph) and by the announcements of possible downgrading of telecommunications firms by major rating agencies. Such downgrading is even more relevant since several large telecommunications issues this year contained coupon enhancement clauses offering an increase in interest paid if the issuer's rating were to decline below a certain grade. Though coupon enhancement clauses or similar arrangements in loans may provide a built-in hedge for deteriorating credit quality, and therefore protect lenders against unforeseeable events, they tend to make the cash flow of telecom firms more vulnerable to potential shocks. This may be one reason why such clauses have recently become less popular and issuers have instead accepted higher spreads.

This large-scale telecommunications issuance is occurring at a time when bond markets are undergoing other fundamental changes. As the supplies of some major government bonds level off or shrink, private sector issues are becoming more important, not just in quantitative terms but also qualitatively, and in some areas they are now competing with government bonds as investments. In Europe, telecommunications bonds have played a prominent role in this process. At end-September, such bonds made up about one quarter of non-financial corporate bonds outstanding in the region as a whole, and around the same proportion in the euro area. Although their share of the overall European bond market is small (less than 6%), the weight of telecoms in the corporate bond segment, and the relatively high concentration of credit risks associated with such bonds, suggest that the performance of the telecommunications sector might be a significant factor for the future development of this nascent financial market.

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3. Derivatives markets

The most recent data published by the BIS on over-the-counter (OTC) market activity show a further significant increase in notional amounts outstanding in the first half of 2000. This was in sharp contrast with the pattern of activity seen on exchanges, where open interest increased modestly over the same period. Turnover on exchanges has generally been subdued since the third quarter of 1998, when the announcement of a debt moratorium by Russia led to turbulence in financial markets. It should be noted, however, that the divergence observed between exchange-traded and OTC business is not a recent development; the gap between the two markets has been growing since the early 1990s. While this dichotomy probably reflects the comparative advantage of OTC markets in the structuring of specially tailored risk management products, it may also have been related to the changing nature of global capital market financing and hedging activity (see below).[17] Lastly, more recent data on exchange-traded derivatives markets show that turnover contracted sharply in the third quarter of 2000, owing in part to calmer market conditions in the early part of the quarter.

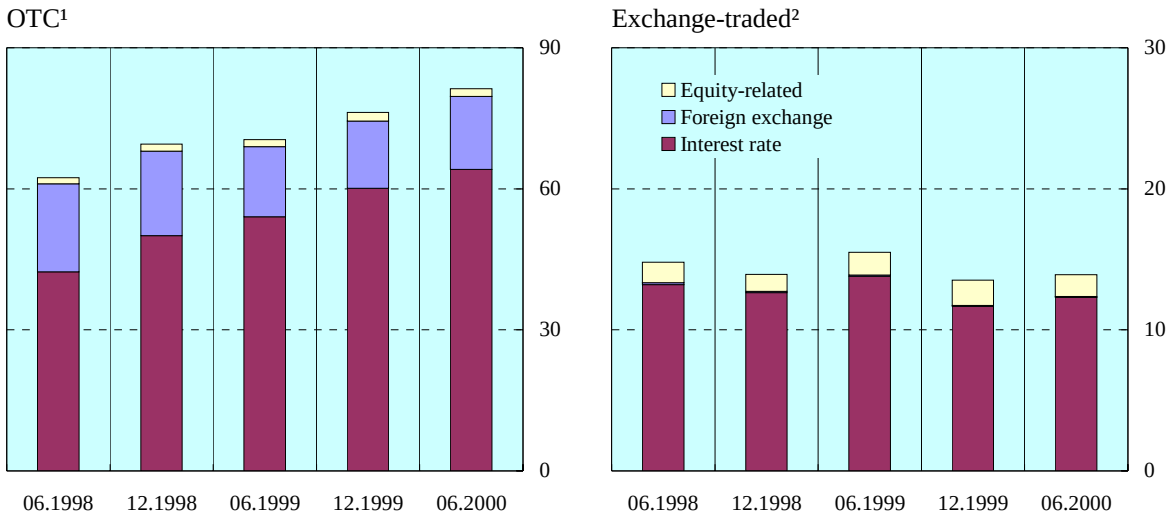
Exchange-traded instruments: slowdown highlights growing divergence with OTC market

Activity in exchange-traded markets fell sharply in the third quarter of 2000, with the dollar value of turnover declining (by 18%, to $85.7 trillion). This represented the most pronounced contraction since the fourth quarter of 1999, when business was affected by the changeover to the new

Graph II.3.1

Positions in global derivatives markets

In trillions of US dollars



¹ Notional amounts outstanding. ² Open interest.

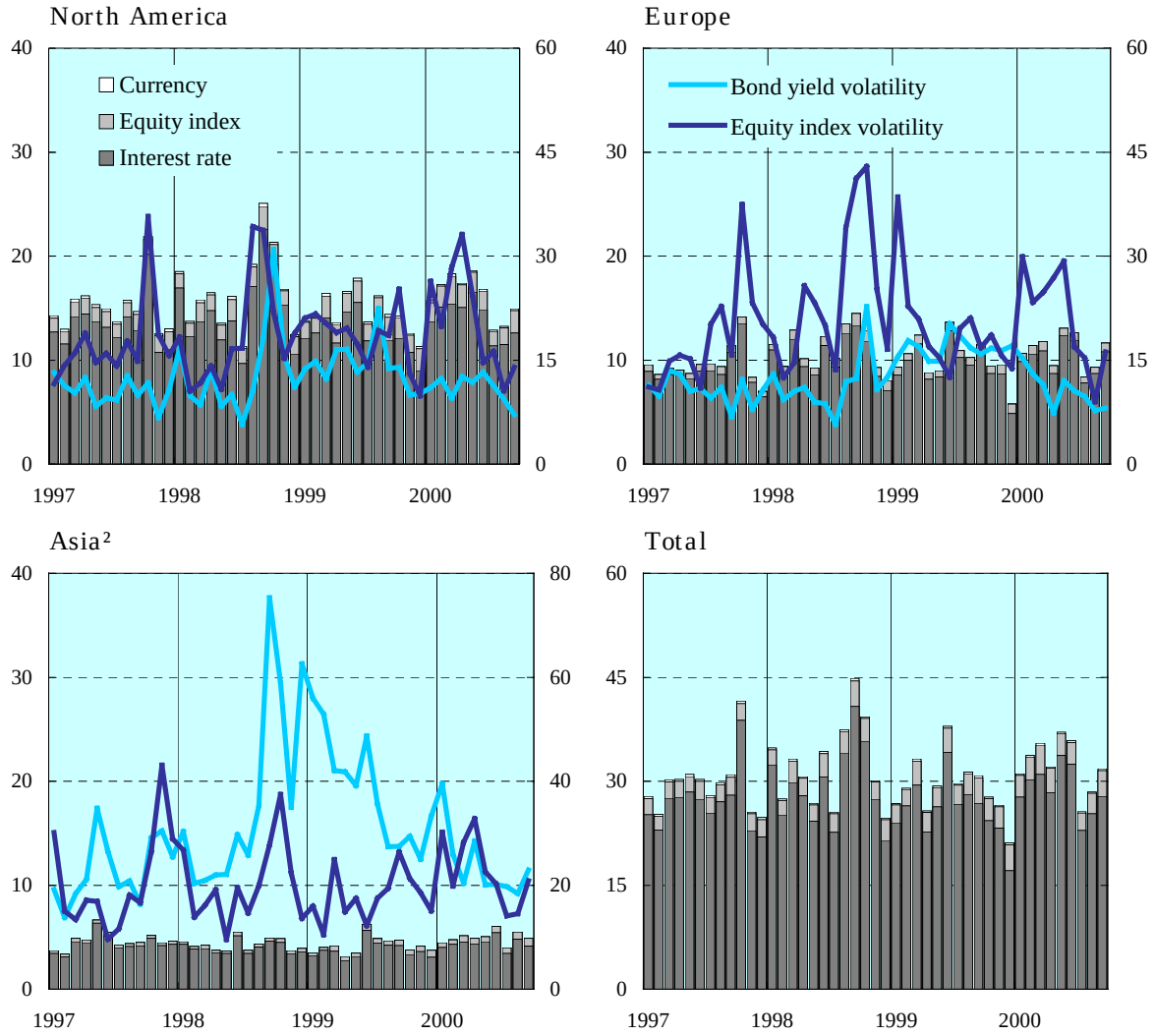
Sources: FOW TRADEdata; central banks; BIS.

[17] The divergence between the two markets has been analysed in various issues of the BIS *Annual Report*.

Graph II.3.2

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

Quarterly data, 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.

millennium. The slowdown was spread across instruments, with a particularly sharp decline in both short-and long-term interest rate contracts. Lower activity appears to have been primarily related to calmer conditions in financial markets in July, although an upsurge of volatility in major equity and currency markets in September was associated with an overall increase in turnover. While most industrialised countries experienced a decline in turnover, business expanded significantly in some emerging market countries, including South Africa and South Korea.

Exchange-traded markets have in fact failed to expand since the record volume of activity reached in the third quarter of 1998. This subdued pattern of activity seems to reflect a longer-term trend. Indeed, a growing gap has been observed between exchange-traded and OTC market activity since the early 1990s. Exchanges have been able to provide a high degree of liquidity in a fairly narrow range of benchmark contracts, but they have not been able to compete with the wide variety of tailor-made risk management products supplied by the OTC market. The greater flexibility of OTC instruments probably explains much of the divergence. This trend has been reinforced recently by changing

patterns of issuance in global securities markets. A declining volume of government bond issuance or buybacks in some of the major reporting countries (such as the United Kingdom and the United States) have led to a decline in secondary market turnover and dampened activity in related derivatives markets.

Changes in the pattern of fixed income issuance in financial markets have also encouraged market participants to consider the creation of better hedging tools for corporate securities.[18] In September, the US Bond Market Association formed a task force to develop proposals for the introduction of a corporate bond futures contract. Members of the task force have suggested that such a contract would be likely to focus on an index of 10-year BBB or A-rated securities. Attempts in the 1980s to list corporate bond contracts failed because of low liquidity of the underlying securities and difficulties in creating a representative basket. The corporate bond market is now much larger and more liquid than in the 1980s (particularly with the trend to issue very large benchmark securities), although liquidity remains concentrated in the largest issues.

Meanwhile, faced with the success of electronic trading in many countries, the members of traditional US exchanges have increasingly come to question the future of open outcry trading. This was particularly evident on the CBOT, where the introduction at the end of August of a/c/e (for Alliance/CBOT/Eurex), an electronic platform for the trading of futures contracts on US Treasury securities, was highly successful. By the end of September, the facility's first full month of existence, it had captured 22% of activity in US Treasury note contracts.

Over-the-counter instruments: continued market expansion

Data from the BIS survey on the global over-the-counter (OTC) derivatives market show continued growth in the first half of 2000. The total estimated *notional amount* of outstanding OTC contracts stood at $94 trillion at end-June 2000, a 7% increase over end-December 1999 and a 30% increase since end-June 1998, when the BIS survey was initiated. At the same time, the ratio of *gross market values* to notional amounts outstanding continued its downward trend.

Growth in the first half of 2000 was led by activity in forward-type contracts, particularly interest rate swaps, outright forwards and foreign exchange swaps. In terms of broad market risk categories, interest rate, foreign exchange and commodity contracts expanded at about the same pace, while equity contracts declined.[19] The new data reveal a number of developments cutting across the different risk categories. For example, they show a continued rise in the share of euro-denominated transactions, particularly in interest rate swaps, where the euro has extended its lead as the largest currency segment. At the same time, the rate of expansion of yen-denominated contracts slowed down considerably relative to the previous review period. In addition, business with non-financial customers expanded fastest in all risk categories, although it remains much smaller than that among reporting dealers and other financial sector entities.

The *interest rate segment* expanded by 7%, to $64.1 trillion. With the stock of forward rate agreements (FRAs) and options stagnating, growth was concentrated in swaps (by 9%, to $48 trillion). Swaps have increased at a more robust pace than other interest rate instruments over the past decade. This may have been related to several factors. First, the growing variety of structures on offer has enabled the swaps market to respond in a more flexible way to the risk management requirements of market participants than exchange-traded markets. More recently, the introduction of the euro has led to a rapid expansion of European capital market issuance, with some of the resulting exposure likely to

[18] Contracts on US Treasury securities have recently become less reliable hedging instruments for corporate securities, as discussed in recent issues of the *BIS Quarterly Review*.

[19] Credit derivatives are not identified in this survey. Data on such instruments will be collected at the time of the next triennial survey of foreign exchange and derivatives activity at end-June 2001.

Table II.3.1

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

Amounts outstanding in billions of US dollars

	Notional amounts				Gross market values			
	End-Dec 1998	End-June 1999	End-Dec 1999	End-June 2000	End-Dec 1998	End-June 1999	End-Dec 1999	End-June 2000
Grand total	**80,317**	**81,458**	**88,201**	**94,037**	**3,231**	**2,628**	**2,813**	**2,581**
A. Foreign exchange contracts	**18,011**	**14,899**	**14,344**	**15,494**	**786**	**582**	**662**	**578**
Outright forwards and forex swaps	12,063	9,541	9,593	10,504	491	329	352	283
Currency swaps	2,253	2,350	2,444	2,605	200	192	250	239
Options	3,695	3,009	2,307	2,385	96	61	60	55
B. Interest rate contracts[2]	**50,015**	**54,072**	**60,091**	**64,125**	**1,675**	**1,357**	**1,304**	**1,230**
FRAs	5,756	7,137	6,775	6,771	15	12	12	13
Swaps	36,262	38,372	43,936	47,993	1,509	1,222	1,150	1,072
Options	7,997	8,562	9,380	9,361	152	123	141	145
C. Equity-linked contracts	**1,488**	**1,511**	**1,809**	**1,671**	**236**	**244**	**359**	**293**
Forwards and swaps	146	198	283	348	44	52	71	62
Options	1,342	1,313	1,527	1,323	192	193	288	231
D. Commodity contracts[3]	**415**	**441**	**548**	**584**	**43**	**44**	**59**	**80**
Gold	182	189	243	262	13	23	23	19
Other	233	252	305	323	30	22	37	61
Forwards and swaps	137	127	163	169	..	..	..	..
Options	97	125	143	154	..	..	..	..
E. Other[4]	**10,388**	**10,536**	**11,408**	**12,163**	**492**	**400**	**429**	**400**
Gross credit exposure[5]					**1,329**	**1,119**	**1,023**	**937**
Memorandum item: *Exchange-traded contracts*[6]	*13,920*	*15,488*	*13,497*	*13,904*	..	..	..	..

[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] 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.

have been hedged in the interest rate swaps market. Finally, buybacks or reduced net issuance of securities by central governments in some of the major reporting countries (with the notable exception of Japan) have affected the liquidity of certain government securities and the effectiveness of traditional hedging vehicles, such as government bond futures. This has encouraged market participants to switch to more effective hedging instruments, such as interest rate swaps.

In the area of *currency instruments*, the value of contracts outstanding increased by 8%, to $15.5 trillion, following a slight decline in the previous reporting period. All types of instrument shared in the expansion, with outright forward and forex swap contracts rising most rapidly (by 9%), followed by currency swaps (7%) and options (3%). Some of the increase in outright forwards and forex swaps may have been related to the upsurge of activity seen in the international interbank market since the second half of 1999.[20] In the case of options, this was the first increase in business following

[20] See the section on the international banking market in the August 2000 issue of the *BIS Quarterly Review.*

four consecutive half-yearly declines. One of the most striking developments was the very sharp rise in currency contracts involving the euro (26%). The review period was marked by rising volatility of the dollar/euro currency pair, which may have fuelled related business. Contracts involving the US dollar and sterling also grew at a robust pace (by 9% and 11% respectively).

Activity in the *equity-linked sector* declined by 8%, to $1.7 trillion. Much of the drop was accounted for by contracts on US equities held by non-financial market participants. In spite of press reports highlighting the rapid growth of retail-targeted equity index products (which often combine fixed income assets and call options), the OTC equity-linked market has not expanded much in recent periods. It remains considerably smaller than the foreign exchange or interest rate market segments, being comparable in size to the exchange-traded equity index market ($1.5 trillion at end-June 2000).

Commodity derivatives markets expanded by 7%, to $0.6 trillion. The rate of expansion of gold contracts, the largest single group in that market segment, slowed relative to the previous review period (to 8% from 29%).

Estimated *gross market values* declined by $232 billion, to $2.6 trillion. The ratio of gross market values to notional amounts outstanding fell to 2.7% at end-June 2000 from 3.2% at end-December 1999, maintaining the downward trend observed since the BIS began collecting OTC market data. Lower ratios were recorded in all market risk categories, with the exception of the commodity-linked segment, which saw an increase. The most pronounced decline took place in foreign exchange instruments (to 3.7% from 4.6%). Much of the reduction was accounted for by contracts involving the yen, which is consistent with the lower volatility of the underlying market during the review period. The decline was less substantial for interest rate instruments (to 1.9% from 2.2%) but was nevertheless notable in the euro segment (to 2% from 2.4%) and the yen sector (to 1.6% from 1.9%), probably also reflecting the lower volatility of underlying markets. It should be noted that gross market values exaggerate actual credit exposures since they exclude netting and other risk reducing arrangements. Allowing for netting, the derivatives-related credit exposure of reporting institutions was considerably smaller ($937 billion, or less than 1% of notional amounts outstanding).

Recent developments in the credit derivatives market

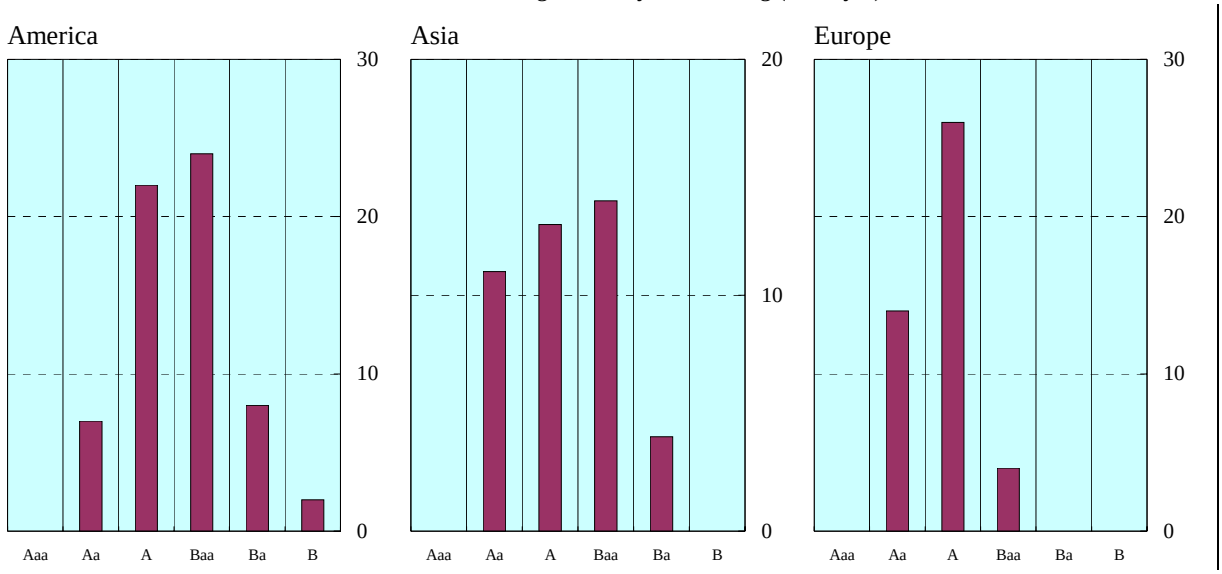
Serge Jeanneau

Credit derivatives are not separately identified in the most recent BIS statistics.[①] However, in July this year, the British Bankers' Association (BBA) released a survey of the global credit derivatives market showing that the notional amount of outstanding transactions had reached $586 billion at end-1999 (compared with an estimated $350 billion at end-1998). Set against the BIS data on the notional amounts outstanding of OTC contracts at end-1999, credit derivatives accounted for less than 1% of the total market. Among the major trends, the survey indicated a growing diversification of products, the development of hybrid instruments and a blurring of distinctions between product lines. It noted a particularly rapid increase in portfolio products[②] and credit-linked obligations. Together, these instruments accounted for 18% of contracts outstanding at the end of 1999, compared with 38% for plain vanilla credit default contracts. The data also revealed that banks continue to be the main buyers and sellers of credit protection, accounting for 63% of the buy side and 47% of the sell side. However, the market is expanding beyond transactions aimed at the restructuring of banks' balance sheets. New participants, such as insurance companies, are increasingly entering the market as sellers of protection. Insurance companies accounted for 23% of the sell side in the latest survey.

There was also a notable increase in the proportion of credit derivatives written against corporate assets and a decline of contracts on sovereign ones. Contracts written on corporate assets accounted for 55% of the market in 1999, while those written on sovereign assets amounted to 20%. Part of the increase was attributed by market practitioners to the development of synthetic securitisation.[③] More recent data on the ratings distribution of underlying assets in credit derivatives transactions show a fairly even dispersion in America and Asia, with Baa being the most prevalent, but some skewing towards higher-rated issues in Europe. The higher quality of underlying assets in European credit derivatives structures reflects the higher average ratings of large issues made in recent periods in European capital markets. The market is likely to draw further support in 2000 from the ongoing wave of M&A financing and the heavy volume of loans and securities issues arranged by telecommunications companies. Improvements in market infrastructure, such as the introduction of better documentation and the development of new swap return indices, should also be supportive.

Ratings distribution of credit derivatives (as of 27 September 2000)

Number of outstanding issues[1] by credit rating (Moody's)



[1] For which credit derivatives are traded.

Source: JP Morgan.

[①] Data on such instruments will be collected at the time of the next triennial survey of foreign exchange and derivatives activity at end-June 2001. [②] Whereby protection can be purchased or sold on a whole portfolio of loans or securities. [③] Synthetic securitisation involves the use of credit derivatives in the transfer of credit risk in securisation structures. One of its main advantages is that it eliminates the need for the physical transfer of securities to a special purpose vehicle.

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III. Special feature: Market liquidity and stress: selected issues and policy implications

Since turbulence engulfed financial markets in mature economies in autumn 1998, market liquidity has attracted increasing attention on the part of market participants, central banks and regulatory and supervisory authorities. In particular, perceptions of a persistent reduction in market liquidity in a number of segments of global financial markets have raised questions about their potential vulnerability to financial disturbances.

The purpose of this note is to explore some of the issues raised by these developments. The first section defines two closely related notions of liquidity, namely market and cash liquidity. The second explains the reasons for the growing interest in market liquidity. The third draws some lessons about the determinants of market liquidity from past episodes of market turmoil. It argues that for a proper understanding of liquidity under severe stress, the interaction of basic order imbalances with cash liquidity constraints and counterparty risk needs to be explained. Leverage and risk management play a key role. It also suggests that some factors that may contribute to liquidity in normal times can actually make it more vulnerable under stress. The final section considers some policy implications.

What is market liquidity?

Much like systemic risk, *market liquidity* is more easily recognised than defined. A working definition is that a market is liquid if transactions can take place rapidly and with little impact on price. So defined, market liquidity has several dimensions.[21] *Tightness* refers to the difference between buy and sell prices, for example the bid-ask spread in a quote-driven market. *Depth* relates to the size of the transactions that can be absorbed without affecting prices. *Immediacy* denotes the speed with which orders can be executed, and *resiliency* the ease with which prices return to "normal" after temporary order imbalances.[22]

The notion of market liquidity is closely related to that of *cash* or *funding liquidity*. Cash liquidity can be defined as the ability to realise ("cash in") value, either via the sale of an asset or access to external funding.[23] This is what underpins an institution's capacity to meet its contractual obligations. In modern financial markets, funding liquidity is best thought of as including command not only over cash and deposits, but also over other instruments that can be used to meet margin calls and hence, effectively, settle transactions, most commonly government securities.

[21] See CGFS (1999a) and BIS (forthcoming).

[22] There may be a trade-off between these various dimensions. For instance, greater competition among institutions providing market-making services can improve tightness (for example by narrowing the bid-ask spreads). However, by reducing the profitability of the activity, this can lead to a withdrawal of capital from it and to a deterioration in market depth, unless offset by other factors.

[23] The loose and general notion of "liquidity" is closely related to cash liquidity. Often, market commentators make statements such as "ample liquidity is boosting asset prices". One way of interpreting this is that market participants have sizeable liquid funds to invest, either because the share of particularly liquid assets (eg money and money substitutes) in their portfolios is high or because they can obtain ample and cheap external finance, especially in the form of credit.

The relationship between market and cash liquidity is a multifaceted one. Some of the links are obvious. For instance, selling an asset in a market or unwinding a profitable position is one way of raising cash. Others, however, are less apparent. In particular, it will be argued below that access to external funding can underpin market liquidity and that the mechanisms that lead to the disappearance of cash liquidity under stress can be similar to those that lead to the evaporation of market liquidity.

Why do we care (increasingly) about market liquidity?

There are two reasons why market liquidity has been attracting increasing attention on the part of market participants, central banks and regulatory and supervisory authorities. The first relates to the long-run development of the financial system, the second to more recent events.

A salient characteristic of the evolution of financial systems since at least the 1970s has been the rapid growth of financial markets. It is only natural that market liquidity should have gained in importance, as a factor underpinning the smooth functioning of the financial system and conditioning the daily activities of economic agents, including pricing, trading and risk management.

Central banks, for instance, have shown a growing interest in market liquidity from the perspective of their responsibility for both monetary and financial stability. As regards monetary stability, the shift towards market-oriented operating procedures[24] and the greater use of asset prices as a guide for policy have put a premium on market liquidity. For example, the reliability of estimates of market participants' expectations about inflation as derived from yield curves depends crucially on the liquidity of the underlying market.[25] As regards financial stability, central banks and supervisory authorities have made growing use of asset prices in the monitoring of vulnerabilities in the financial system, as they contain information about market participants' assessment and pricing of risks. The validity of this information in turn underpins market discipline, an aspect that has received increasing attention in recent policies.[26] Above all, as financial institutions have come to depend more and more on markets for their risk management, *robust market liquidity under stress* has become critical and, in turn, increasingly influenced by risk management practices. The dislocations generated by the evaporation of liquidity in some key fixed income and foreign exchange markets in autumn 1998 are a clear illustration of the heightened significance of market liquidity for financial stability.[27]

In fact, the Asian crisis in 1997, and especially the turbulence in mature markets in autumn 1998, represented a watershed in market liquidity conditions in several segments of global financial markets. To the surprise of many observers and market participants alike, these episodes of financial distress heralded a protracted period of diminished market liquidity. While many markets have recovered since then, questions remain about the scope, causes and possible implications of these developments. In particular, lingering doubts have been voiced about the resilience and robustness of market liquidity in the current environment.

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[24] In particular, technical liquidity management operations, which are not intended to convey signals about the stance of policy, rely on liquid markets that allow transactions to take place without affecting the underlying price. In the case of the Federal Reserve, for instance, all market operations are of this kind, as the key policy signal is represented by announcements of the target federal funds (overnight) rate. See Borio (1997) for an elaboration on the link.

[25] See, for instance, BIS (1998a).

[26] Notably, market discipline has become Pillar 3 of the new capital adequacy proposals. See BCBS (1999a).

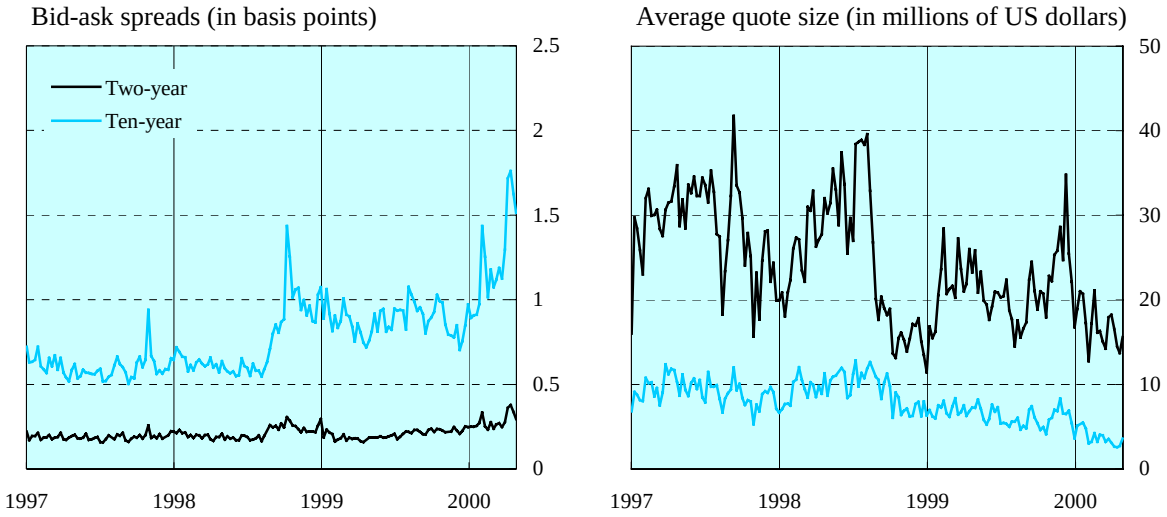
[27] The growing interest in market liquidity on the part of central banks is reflected in several recent publications of the Committee on the Global Financial System (formerly known as the Euro-currency Standing Committee), the standing committee of senior central bank officials that has among its tasks that of examining the functioning of markets. These publications include a report that explores the determinants of liquidity in government bond markets (CGFS (1999a)), a set of guidelines for the establishment of deep and liquid government bond markets, with particular reference to emerging market countries (CGFS (1999b)), and a report that investigates the dynamics of the evaporation of liquidity during the market turbulence in 1998 (CGFS (1999c)).

Given the difficulties in measuring market liquidity, its evolution is hard to document. In spring 1999, surveys of market participants pointed to perceptions of a widespread reduction in market liquidity in several markets relative to the pre-turbulence period. This was especially true for fixed income and foreign exchange instruments, both with respect to tightness and depth. A variety of measures suggest that the decline in tightness and depth since 1997-98 has been most marked and persistent in the US government bond market (Graph III.1). Markets for dollar fixed income instruments from emerging economies also appear to have been lastingly affected, though to a lesser extent (Graph III.1).[28] This also appears to apply at least in part to foreign exchange markets. According to market sources, forex turnover declined markedly in autumn 1998, when the broad financial market turmoil was

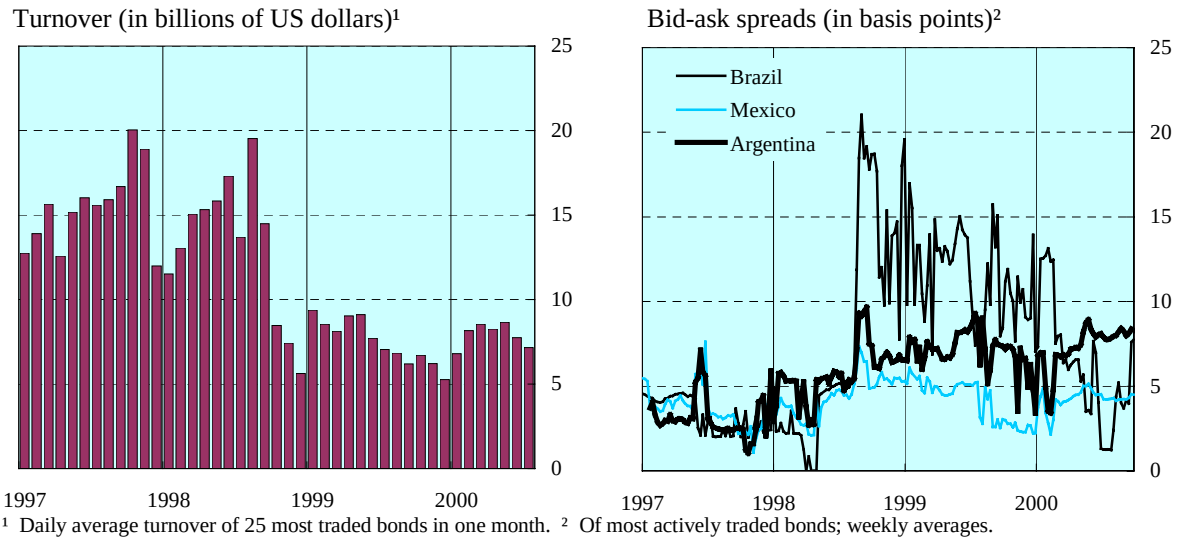
Graph III.1

Indicators of market liquidity in bond markets

US Treasury securities



Dollar-denominated emerging market bonds



¹ Daily average turnover of 25 most traded bonds in one month. ² Of most actively traded bonds; weekly averages.

Sources: Federal Reserve Bank of New York; Fleming (2000), based on data from GovPX; Bloomberg; Euroclear.

[28] Some local currency fixed income markets, however, are more liquid than ever, as a result of the steps taken to develop them.

accompanied by a global reduction in liquidity. The decline was particularly pronounced in emerging markets, as described in more detail in the box "Forex trading volumes, volatility and spreads in emerging market countries", on pages 49-51. In the months that followed, global forex turnover appeared to have recovered but to levels well below those reached in 1998. Measures of tightness too seem to have recovered since then, as suggested by a normalisation of spreads in emerging market countries.[29]

These indicators, however, are not forward-looking. Their message, therefore, has failed to dispel the perception that the depth of markets, particularly under stress, may be less robust than in the past.

Several reasons can be put forward for the perceived decline in market liquidity. Some of these are in part related to the recent episodes of market turbulence, which have arguably played a catalytic or reinforcing role. Others reflect independent structural developments.

Severe dislocations leave a legacy of reduced liquidity in the market segments affected. Scars take time to heal, especially if market-makers experience severe losses and doubts arise about the profitability of trading strategies, or validity of hedging practices, that were directly or indirectly providing liquidity to the market in normal conditions. There is, for instance, evidence of a protracted reduction in market liquidity in some segments of equity markets following the crash of 1987.[30]

These ingredients were again evident in the recent episodes of market turbulence. In Asian and, subsequently, US markets, institutions providing liquidity services came under strain as a result of the financial turbulence. Strategies that had proved consistently profitable suddenly generated huge losses, as exemplified by foreign currency carry trades and relative value arbitrage transactions. The turmoil accelerated the exit from the industry of market players who had been contributing to a perception of liquidity by taking the other side of trades in the tranquil market conditions that preceded the turbulence, such as some macro and relative value arbitrage funds. The winding-down of Long-Term Capital Management is just the most salient example, as some large macro funds have since voluntarily exited.[31] Hedging operations in government bond markets were thrown out of kilter as the spread between government and corporate securities defied previous historical relationships, encouraging a shift away from government securities towards swaps for hedging purposes. Reportedly, the turbulence was a factor inducing several institutions to strengthen risk management and reassess the risk/reward trade-off associated with market-making, apparently leading to a reduction in the amount of capital devoted to this activity. This response may have been reinforced by the trend towards global consolidation among market players. Apart from limiting the need to execute trades in the market, this trend is encouraging cutbacks in position and credit limits.

As elaborated further in the special feature "Size and liquidity of government bond markets", on pages 52-58, in the US government bond market the announced debt repayment programme has been a major contributor to the persistence of the reduction in market liquidity. After some transition difficulties, part of that liquidity migrated to swaps markets, whose role as benchmarks for pricing and as hedging vehicles has increased.

Finally, and more speculatively, questions have been raised about the impact of the proliferation of electronic trading platforms. One concern is that this may lead to an excessive fragmentation of market

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[29] There is also some evidence that the price impact of trades associated with transactions by non-residents in equity markets has failed to recover to pre-turbulence levels in several emerging market countries (Persaud (2000a)).

[30] See, for instance, BIS (1988) and International Stock Exchange (1988). The imbalance between demand for and supply of market liquidity cannot be detected in direct measures of market depth and tightness but may be seen indirectly in the relative yield on securities. Thus, when the imbalance is especially high, the premium on liquidity increases, so that the return required on less liquid securities rises in comparison with that on their more liquid counterparts. This pattern is typical of flights to safety.

[31] See the special feature "Hedge funds" on pages 61-71.

liquidity.[32] Another, more controversial, concern is that the shift towards auction-based trading mechanisms that has accompanied the spread of electronic platforms might reduce market depth.[33]

While the potential factors affecting market liquidity can easily be listed, it is fair to say that we lack a good understanding of their relative importance or, indeed, of the scope and implications of the processes at work. This lack of understanding and the greater awareness of the ease with which liquidity can evaporate even in highly developed financial markets, not least on the part of official authorities and risk managers, have no doubt contributed to a lingering sense of unease.

What determines market liquidity under stress?

Against this background, attempting to draw some lessons about the determinants of market liquidity from past episodes of market turbulence becomes all the more important. What follows highlights four propositions and selected implications.

The *first lesson* is that the relative significance of the factors that determine liquidity under normal conditions and under stress can differ substantially. In particular, under severe stress counterparty risks and liquidity constraints can be of first-order importance, whereas they are not generally binding otherwise.[34] There are at least three reasons for this.

First, while sometimes overlooked, the process of trading can generate large, albeit in some cases short-lived, credit exposures, which make the willingness to transact a function of counterparty risk. Credit exposures are generated in the settlement process. In this case, they arise from the lack of synchronisation between the payment and delivery legs of transactions, for both securities and foreign exchange (eg, so-called Herstatt risk), from the financing needed to meet delivery-versus-payment trades, and, to a lesser extent, from the lags between trading and settlement dates.[35] In addition, counterparty risk is inherent in derivatives transactions, where the size of the exposure can be very sensitive to the change in market prices. As risk management tools, derivatives originally targeted market risk. A neglected consequence, however, was the creation of credit exposures associated with the trades that have a positive market value vis-à-vis counterparties. The pyramiding of transactions often needed to take or hedge positions adds to these credit risks. Finally, external funding is common to finance positions and inventories, for example through repos.

Second, the exposures and risk profiles arising from trading can be just as opaque as those of traditional loan portfolios, and possibly even more so. Opaqueness is associated with complex trading strategies and the speed with which information can become stale.

Finally, the functioning of securities and derivatives markets relies fundamentally on the availability of cash liquidity. At bottom, settlement can be seen as a mechanism through which economic agents limit or eliminate counterparty risk. Trading generates enormous settlement volumes that need to be financed; for each seller, there is a buyer. And even instruments designed to limit average settlement

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[32] Greenspan (2000), for instance, discusses these concerns with respect to equity markets. Levitt (2000) considers the reasons for, and obstacles to, intermarket linkages.

[33] A common view is that quote-driven markets, where market-makers stand ready to buy and sell at posted prices, can be more liquid than order-driven markets, where no such specialised tasks are performed. There is, however, no clear evidence that this is indeed the case under stress (see below). Moreover, liquidity in quote-driven markets depends critically on the continued viability and soundness of the market-makers themselves, which may raise particular concerns in those market segments where concentration in the market-making business is very high.

[34] The bulk of the academic literature, by contrast, deals mainly with questions of asymmetric information, where some traders are assumed to know more about the value of the asset traded than others, or concerning pre-trade and post-trade information, since liquidity under stress is not their focus. For excellent reviews, see O'Hara (1995) and Lyons (forthcoming). More recently, some attention has started to be paid to net wealth and liquidity constraints; see for example Kyle and Xiong (2000).

[35] See, for instance, Borio and Van den Bergh (1993).

volumes can generate highly variable cash needs, which balloon at times of stress as prices change sharply. For instance, to the extent that they do not require repayment of principal, futures or interest rate swap contracts reduce the settlement and counterparty risks compared with the cash transactions that would replicate the same payoffs. But the daily marked-to-market margining and settlement of these contracts mean that the corresponding demands on cash flows rise,[36] possibly non-linearly, as market prices move.

As a corollary, a market can stop functioning, or seize up, in ways that are similar to how a financial institution can fail to meet its obligations when starved of cash: concerns about the creditworthiness of counterparties[37] and the influence of liquidity constraints underlie both processes. The *willingness* to trade is undermined by doubts about the capacity of counterparties to settle the transactions. The *ability* to trade can be heavily curtailed by the lack of the external funding needed to engage in trades and honour margin calls. Moreover, cash and market liquidity tend to reinforce each other. An inability to raise external funding can force the generalised liquidation of profitable positions, while rapidly changing prices can result in surging funding needs. The interaction between concerns about counterparty risk and liquidity constraints was highly apparent in the market turbulence of autumn 1998, but had also been a factor in previous episodes of severe stress, such as the failure of Drexel Burnham Lambert and the 1987 stock market crash.[38]

The bottom line is that the distinction between markets and institutions is sometimes overemphasised. In particular, the conventional wisdom that the growth of markets for tradable instruments significantly reduces the risk of funding liquidity crises should be questioned. Modern financial markets rely on access to funding liquidity, while trading counterparty risks together with mark-to-market practices and margining can make funding needs highly variable and vulnerable to crises of confidence. Moreover, the process of the evaporation of liquidity under stress has certain self-fulfilling aspects to it. Concerns about prospective lack of liquidity or large pending orders can exacerbate order imbalances. For all of these reasons, one could say that markets, just as institutions, can be subject to runs.

The *second lesson* is that the arrangements for dealing with counterparty risk in the various market segments can play a major role in determining market liquidity under stress. All else being equal, markets with centralised counterparties can be more robust as long as the soundness of the central counterparty is ensured.[39] The corresponding risk mitigation and sharing mechanisms as well as greater transparency are factors that facilitate trading under stress. There is, in fact, a well documented tendency for exchange-based derivatives markets, where participants tend to lay off their residual risks, to act as a kind of market liquidity provider of last resort for OTC markets.[40] Experiences during autumn 1998 or at the time of the bond market crash in 1994 are no exception. Arguably, these market

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[36] In this case, cash should be interpreted broadly to include any asset that can be used to meet margin calls.

[37] And, via trading links, concerns about the creditworthiness of the counterparties of counterparties, etc.

[38] See CGFS (1999c) and BIS (1988) and (1994). In particular, the CGFS report characterises the market turbulence in 1998 as a "global margin call". Beyond obvious similarities, the episodes exhibited a number of differences. For example, compared with the 1998 market turbulence, during 1987 deleveraging was arguably less significant and the source of order imbalances had more to do with positive feedback trading strategies such as portfolio insurance; see also CGFS (1999d) and Gennotte and Leland (1990). Likewise, the disruptive interaction of markedly different sets of trading, regulatory and institutional arrangements was more prominent in 1987. These differences can exacerbate large and sudden intermarket trading flows, distort price and quantity signals and make it harder to distinguish liquidity from solvency problems; see, notably, Presidential Task Force (1988).

[39] This need not be the case, as illustrated by concerns about the soundness of the Options Clearing Corporation at the time of the 1987 stock market crash. See, for example, Securities and Exchange Commission (1988) and Bernanke (1990).

[40] For an examination of clearing and settlement arrangements in OTC and exchange-based derivatives markets, see CPSS (1998a) and CPSS (1997).

characteristics are more relevant than others, such as the distinction between quote-driven and order-driven markets, which often appear to attract more attention.[41]

The *third lesson* is that the dynamics of market liquidity depend crucially on the performance of risk management systems. Market participants, and especially market-makers, need to make sure that they operate with sufficient cushions in terms of capital and liquidity so as not to be forced into the liquidation of positions and distress selling that would exacerbate market strains. Likewise, they should have sufficient information about their counterparties so as to be able to take informed decisions about the risks they wish to incur. And risk management strategies that assume ex ante the existence of liquid markets in which to hedge and lay off risks lead to pressure on those markets and reduced market liquidity precisely when it is most needed.[42]

A corollary is that financial institutions that structurally provide liquidity to the economy in normal times may not necessarily be the best suited to supply market liquidity under stress. The reason is that they would tend to finance their market-making activity through leveraged positions and short-term funding. All else being equal, this would imply a greater sensitivity of their net wealth and funding positions to changes in market prices. In turn, this would naturally result in shorter investment horizons under stress. This puts a premium on proper risk management to overcome the possible comparative disadvantage of their funding and liability structures.[43] From this perspective, the balance sheet structure of pension funds or insurance companies may make it easier for them to provide liquidity in periods of strain than it would be for banks and, in particular, securities firms. Conversely, risk management processes of institutional investors that do not exploit their potentially longer investment horizon can unnecessarily add to strains on market liquidity. An obvious example was the widespread use of portfolio insurance strategies in the run-up to the 1987 stock market crash.[44]

The *fourth lesson* is that episodes of severe strain on market liquidity are often preceded by extended periods in which, at least with hindsight, balance sheets become overextended through the accumulation of leverage, that is, risk exposure relative to capital. In other words, one needs wood to make a fire, and the intensity and life span of the fire depend on the amount of wood available. In 1997, for instance, the wood was represented in particular by carry trades in Asian currencies, in 1998 by the proliferation of relative value and credit risk arbitrage strategies, and in 1994 by yield curve plays.[45]

The implication is that, in the run-up to the financial strains, markets may appear *artificially liquid*. The success of (leveraged) trading strategies generates profits, adds to market-making capacity and lulls participants into a false sense of security. Liquidity may be perceived as highest precisely when it is most vulnerable.

Seen from this perspective, the current situation can give rise to contrasting assessments. The glass can be seen as half full. Market liquidity could justifiably be regarded as having been artificially high before the market turbulence and as having returned to more realistic levels after a traditional overshooting. This view would stress the benefits deriving from more sober assessments of risk/reward trade-offs and improved risk management practices. Remaining difficulties in certain

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41 For instance, the OECD (1991) concluded that it was difficult to judge which of the two types of market had performed more effectively during the 1987 stock market crash.

42 For an interesting theoretical analysis of aspects of this problem, see Morris and Shin (2000). Thus, under stress the supply of liquidity is reduced precisely as the demand rises sharply. The change in the pricing of liquidity is also reflected in the increase in the spread between the less liquid securities and the most liquid ones, a situation that can persist for some time. See BIS (2000) and the special feature "Size and liquidity of government bond markets", on pages 52-58.

43 However, normal access to central bank funding, both intraday and for longer maturities, can be a compensating factor.

44 Albeit less damaging, increasingly popular trading practices, such as indexing, can also restrict the number of contrarians in markets.

45 For 1997, see BIS (1998b); for 1998, see CGFS (1999b), BIS (1999) and IMF (1999); for 1994, see Borio and McCauley (1996), BIS (1995) and IMF (1995).

market segments, such as US government bonds, would be viewed as purely instrument-specific. The glass, however, can also be seen as half empty. Such an assessment would probably place more emphasis not on the specifics of market liquidity, but on remaining sources of potential systemic disturbances to global financial markets. It would also stress the risk of unpredictable responses in asset prices as market participants adjust to a world in which, for the foreseeable future, the traditional roles of US government bonds as benchmarks and a safe haven are diminished.[46]

What can be done to promote robust market liquidity?

As the foregoing analysis makes clear, lack of market liquidity under stress is generally a symptom of problems that originate elsewhere. Prices in a market where order imbalances develop will need to adjust, that is precisely their function. Beyond seeking to ensure that the market allows willing buyers and sellers to transact,[47] the more critical issue is why and how the order imbalances develop in the first place. Market liquidity is only in part a property associated with market arrangements, such as market-making procedures or trading platforms. Market-makers, for instance, cannot be expected to stand in the way of the juggernaut. Ultimately, it rests on the way participants perceive and respond to risks and returns. And the *illusion of permanent market liquidity* is probably the most insidious threat to liquidity itself. Markets are *expected* to be liquid, loans are *known* not to be.

Some of the prerequisites for liquid markets in general are well understood. For example, in its guidelines for the development of deep and liquid government bond markets the BIS Committee on the Global Financial System lists the following factors: a competitive market structure, low fragmentation, minimisation of transaction costs, heterogeneity of market participants and a sound infrastructure.[48] But if the focus is robust liquidity under stress, some of these factors are arguably relatively more important (see below). Moreover, policies would need to address the root causes of order imbalances and the propagation of disturbances. Clearly, any policy that addresses financial instability would be relevant. What follows, however, focuses on a limited set, more closely related to market liquidity proper. Policies can be directed either to individual market participants or to markets generally and their infrastructure.[49] Each of these is taken in turn.

Policies aimed at individual financial institutions take two forms. The first is encouraging better risk management. The second is promoting the dissemination of better information about risk profiles.

Better risk management means practices that address and recognise the interaction between the different types of risk (market, credit and liquidity risk) and are tailored to the kind of activity performed. Measurement and management of counterparty risk are crucial. It also requires a keen awareness of the fact that actions that may appear reasonable from the perspective of individual institutions may actually worsen market outcomes. Following mechanistic defensive responses at times of stress is a case in point. For instance, the mechanical application of dynamic hedging, value-at-risk limits or equivalent stop-loss strategies could easily reinforce market movements, especially if the original design of these tools fails to incorporate the possibility that liquidity is variable and to a large extent endogenous. This can be a serious problem, but one which is very difficult to solve. Encouraging more forward-looking measures of risk may be part of the answer. Stress testing is one

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[46] See the special feature "Size and liquidity of government bond markets", on pages 52-58, and, for the safe haven role, Wojnilower (2000).

[47] Even this is not self-evident, given the long-standing debate that surrounds the desirability of circuit breakers, such as temporary trading halts.

[48] See CGFS (1999b) for further discussion of more concrete policy recommendations stemming from these general factors. See also APEC (1999). In addition, the special feature "Size and liquidity of government bond markets", on pages 52-58, elaborates further on the policies that can be implemented to promote liquid government bond markets.

[49] Given the close linkages between firm behaviour and market liquidity, however, this categorisation is admittedly somewhat arbitrary.

such example, especially if informed by measures of market vulnerabilities (see below). Operating with greater *safety cushions* relative to the limits, which institutions can afford to run down at times of turmoil, is another. At a minimum, these cushions would provide breathing space to examine not only the risks, but also the potential rewards of taking a contrarian position. Partly under official prodding, the experience of 1998 has spurred a significant improvement in risk management philosophies and practices.[50] But it is widely recognised that further progress is called for.

Promoting the dissemination of better information about risk profiles involves strengthening standards of disclosure. Obviously, disclosure is not a panacea. Limitations in the use of information are arguably more serious than those in its availability. And difficult questions need to be addressed, including proprietary concerns, the feasibility of supplying information that is both meaningful and digestible, and the balance between comparability and relevance. Even so, providing timely information about risk profiles is a necessary condition for the proper measurement of risk and the exercise of market discipline.[51] Several initiatives are under way in this area.[52]

Policies directed to markets per se can be classified into two categories: those that pertain to market infrastructures and those that deal with the development of information about incipient market vulnerabilities.

Strengthening the market infrastructure is vital to ensure that the markets continue to function effectively under stress. The 1987 market crash, for instance, spurred a series of measures aimed at improving trading capacity and order execution.[53] More generally, upgrading clearing and settlement arrangements plays a key role, as it allows better management of counterparty risk and can dampen the propagation of disturbances. Efforts to promote the implementation of delivery-versus-payment or payment-versus-payment mechanisms, contract netting and cross-margining, to reduce settlement lags and to improve the legal underpinning of contracts are obvious examples. In recent years, considerable progress has been made in this area.[54]

In contrast, developing information about incipient market vulnerabilities is substantially harder and very much in its infancy.[55] By analogy with the provision of information about the risk profiles of individual institutions, its function would be to allow participants to assess the sources of strains that

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[50] See, in particular, the efforts made by the private sector, as described in CRMPG (1999), the Basel Committee document on highly leveraged institutions (1999b) and the one evaluating the progress made since the original recommendations (2000). The special feature "Hedge funds", on pages 61-71, discusses the management of counterparty risk vis-à-vis hedge funds and the various official efforts in this area in more detail.

[51] In addition to the efforts being made in national jurisdictions and by international regulatory bodies, work is being taken forward by a joint group that brings together representatives of the Committee on the Global Financial System, the Basel Committee on Banking Supervision, the International Organization of Securities Commissions and the International Association of Insurance Supervisors.

[52] It has long been recognised that, in certain circumstances, disclosure may actually be destabilising. This was the conventional wisdom regarding financial distress at banks, but the point has recently been made with respect to market crises too (eg Persaud (2000b)). Rather than an argument against disclosure per se, this can best be regarded as one in favour of *early* and *frequent* disclosure, so as to strengthen prevention and avoid discontinuities in the flow of information.

[53] See, for example, Lindsey and Pecora (1998).

[54] See BIS (1994) for an overview and CPSS (1998b) on progress in addressing foreign exchange transactions. A joint CPSS-IOSCO Task Force is in the process of developing recommendations for the design, operation and oversight of securities settlement systems, covering both individual systems and the cross-border linkages between them. For a description of cross-border securities settlement systems, see CPSS (1995).

[55] A related issue is the provision of information about the motivation behind trades. In particular, on the basis of the 1987 stock market crash experience, it has been argued that disclosing information about the volume of trading strategies insensitive to fundamental value, such as portfolio insurance, could alleviate the intensity of price movements and, by implication, strains on market liquidity. The reason is that traders would not erroneously infer from the selling pressure that views about the true or correct value of the asset have changed and would thus be more willing to accommodate the pressure. For the theoretical underpinnings of this argument, see, for instance, Gennotte and Leland (1990).

arise from the *commonality* of exposures and their *interaction*. This would inevitably be based on some form of aggregation of risk information about individual institutions. But exactly what information this should be or, indeed, whether the development of useful aggregate information is feasible are still very much open questions.[56]

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[56] A first step in addressing these questions has been the exploration of the aggregation of stress tests in CGFS (1999d).

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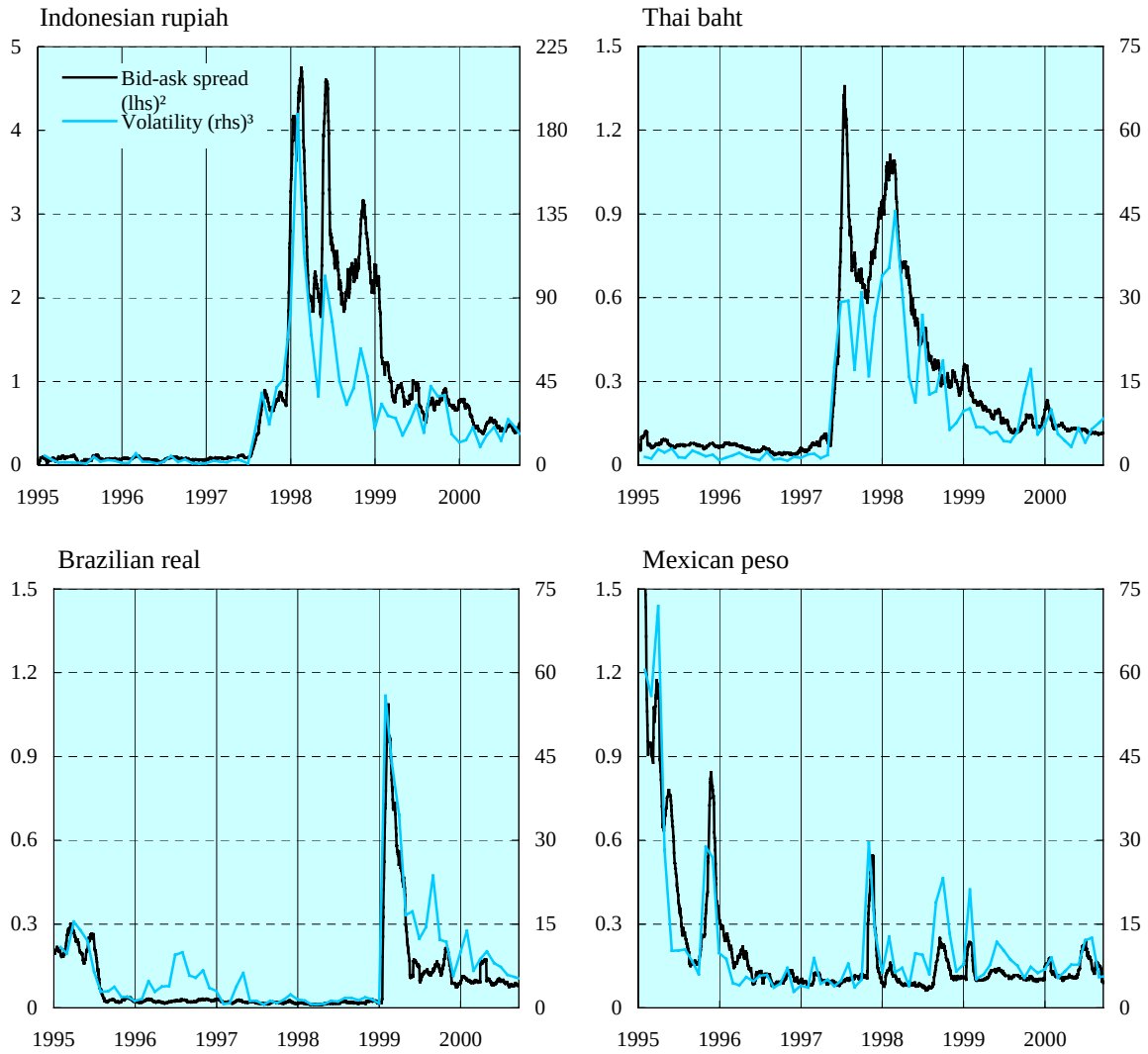
Forex trading volumes, volatility and spreads in emerging market countries

Gabriele Galati[①]

Market participants and central banks are increasingly focusing on monitoring the current conditions of financial market liquidity and trying to assess how it is likely to evolve in the near future. This note describes how liquidity in the foreign exchange markets of emerging market countries has changed over the past five years. It examines: bid-ask spreads, which measure tightness; trading volumes, which can viewed as being related to depth; and volatility, which is generally considered to be a measure of risk.

Graph A shows the behaviour of bid-ask spreads and historical exchange rate volatility for the dollar/baht, dollar/rupiah, dollar/real and dollar/Mexican peso exchange rates since 1995.[②] Graph B reports the historical

A. Volatility and bid-ask spreads in selected foreign exchange markets[1]

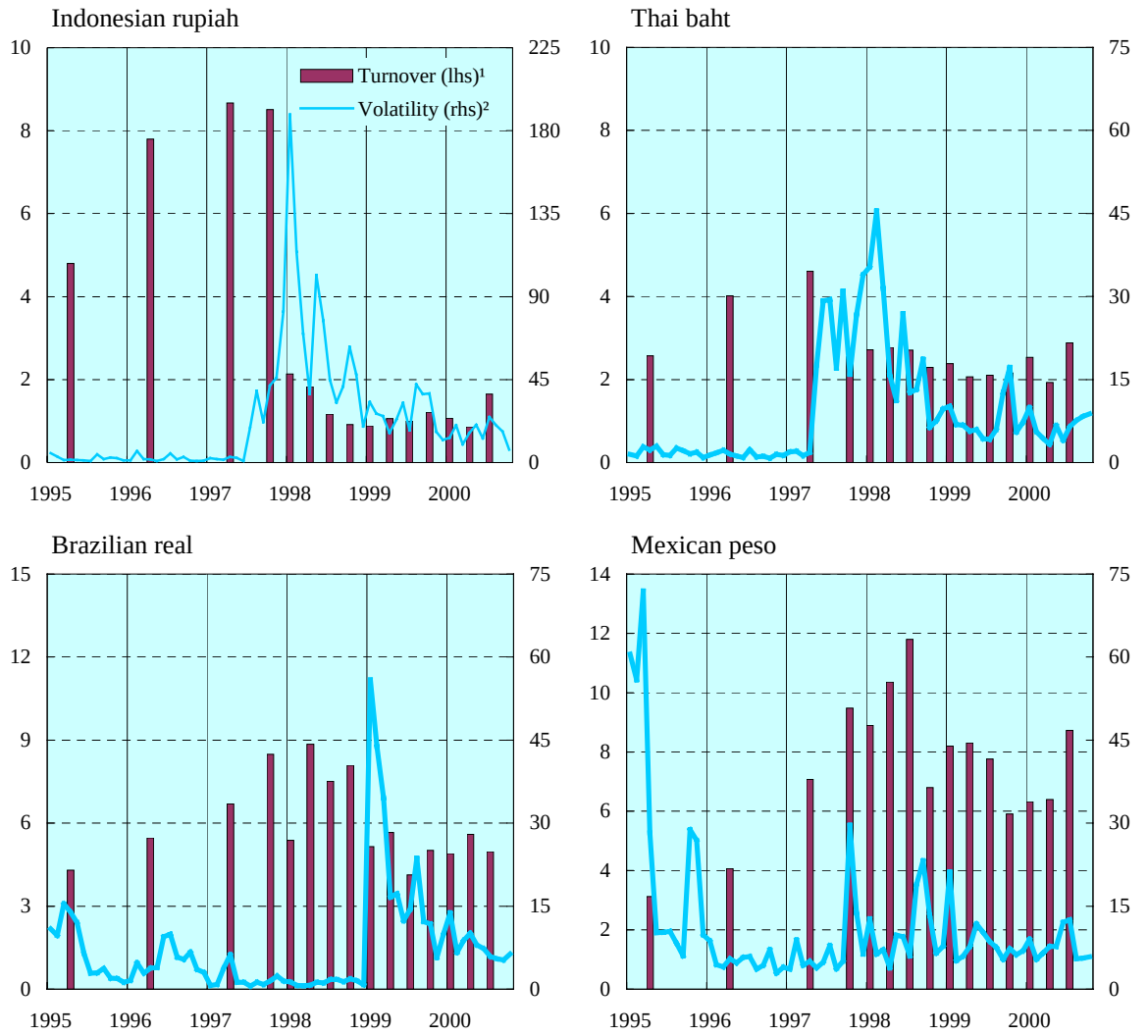


[1] Against the US dollar. [2] Percentage deviation from the midrate. [3] One-month annualised standard deviation of daily percentage changes.

Sources: Datastream; Reuters America.

[①] Angelika Donaubauer provided excellent research assistance. [②] Dollar exchange rates are defined in terms of units of domestic currency per dollar. The quality of data on bid-ask spreads (which are taken from DRI) has been questioned for higher frequencies, but much less so for lower frequencies. Moreover, it is likely that the incidence of measurement error is less important for data from emerging markets, since they are highly volatile. [③] A fairly active offshore market for dollar/rupiah and dollar/baht exchange rates existed in Singapore in the mid-1990s but dried up following the Asian crisis. Local trading volumes therefore underestimate total turnover until 1997 but are fairly representative thereafter.

B. Trading volumes and volatility in selected foreign exchange markets



¹ Estimates of local turnover in the domestic currency as reported by the respective central banks, net of double-counting, per trading day in the month shown (in billions of US dollars) except: for Brazil and Mexico, including other currencies; for Indonesia, on a gross basis and, for 1995 and 1996, annual averages; for Thailand, 1995 second half and 1996 annual averages. ² One-month annualised standard deviation of daily percentage changes in the exchange rate against the US dollar.

Sources: Central banks; Datastream; BIS calculations.

volatility of these exchange rates together with their turnover in local forex markets.[③] The table presents some summary statistics.

The graphs reveal some interesting characteristics of forex markets in emerging market countries. First, bid-ask spreads and volatility have moved closely together, as the microstructure theory on inventory risk predicts. For the exchange rates under investigation, the correlation coefficient of spreads and volatility ranges between 0.76 and 0.87. According to this theory, a rise in exchange rate volatility increases price risk and hence the cost of maintaining open positions. To compensate for this higher cost, traders demand wider spreads. Second, on average over the past five years turnover has been negatively correlated with volatility and spreads. The correlation coefficient of volumes and volatility lies between –0.20 and –0.40 for the baht, rupiah and peso and is –0.82 for the real. The coefficient for volumes and spreads is around –0.50. This result appears to be driven by the incidence of periods of turbulence. Third, the interaction between volatility, volumes and spreads can be characterised by three distinct sets of conditions in forex markets.[④]

[④] The similarity between the panels on Mexican forex markets and Graph III.1 on Latin American bond markets (p 40) suggests that this characterisation may also hold for bond markets.

Conditions of normal market liquidity can be identified by relatively low volatility, low spreads and high turnover. Related research shows that given this set of conditions a rise in volatility is typically associated with an increase in (unexpected) trading volumes (Galati (2000)). These conditions existed in the dollar/rupiah and dollar/baht markets in 1995 and 1996, in the dollar/real market until mid-1998 and in the dollar/peso market from mid-1996 to mid-1998. In these markets, turnover actually followed a rising trend in the mid-1990s, as commercial banks tried to compensate for the anticipated loss of revenue from European forex trading by shifting resources to emerging markets. International investors appeared to profit in particular from the stability of Asian exchange rates combined with relatively high domestic interest rates.

During periods of turbulence, liquidity dried up, as suggested by sharp rises in volatility and a marked widening of spreads (to up to four times their values in normal times). Trading volumes rose before the crises but dropped dramatically when volatility reached its height. These features could be observed during the 1997 Asian crisis, the period of global financial market turmoil in autumn 1998 and the speculative attack on the real in January 1999.[5]

Market liquidity appeared to be low during the periods following crises. This is indicated by declining volatility and narrowing spreads, which stabilised above pre-crisis levels. It is also suggested by trading volumes stable at below pre-crisis levels. One noteworthy feature that is evident from the graphs is that spreads narrowed fairly quickly, while it took quite some time before trading volumes picked up, reflecting a gradual return of investors to these markets.

The behaviour of the markets described in this note is to a large extent characteristic of emerging market countries, and these countries account for only a minor share of total forex turnover.[6] Nevertheless, there are some important parallels with global forex market conditions. Total forex trading appeared to have declined markedly in autumn 1998, concomitant with the general reduction of liquidity that affected financial markets. Market sources suggest that trading volumes, and hence, arguably, depth, rebounded several months later, but are currently still significantly below the levels reached in early 1998. While market commentary indicates that since autumn 1998 tightness has generally improved somewhat, it is difficult to gauge how it has evolved in different market segments.

Historical averages, 1995-2000

	Volatility	Spreads	Turnover
Mexican peso	11.41	0.11	7.55
Real	7.40	0.05	6.01
Rupiah	23.60	0.36	2.90
Baht	9.10	0.13	2.69
Memorandum item:			
Yen/dollar	*12.09*	*0.10*	*10.92(*)*

Note: During the period under review, the four currencies followed different official exchange rate regimes. The peso floated independently throughout the period. The real moved within an adjustable band until it was floated in January 1999. The baht was pegged to a basket of currencies before being floated in July 1997. The rupiah followed a managed float against a basket of currencies of major trading partners until it was floated in summer 1997. Historical volatilities are computed with daily data over rolling windows of 20 business days. Average daily turnover, in billions of US dollars. (*) Traded on the Tokyo interbank market. In April 1998, average daily *global* turnover for yen/dollar transactions amounted to $267 billion. Total forex turnover in April 1998 was $1,500 billion.

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Galati, Gabriele (2000): "Trading volumes, volatility and spreads in foreign exchange markets: evidence from emerging market countries", BIS Working Paper No 93.

[5] They are also visible for the tail of the 1994-95 Mexican crisis. [6] In April 1998, it amounted to less than 3% of total forex market turnover (BIS (1999)).

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IV. Special feature: Size and liquidity of government bond markets

Feast and famine have hit government bond markets simultaneously. While the US Treasury market is shrinking the fastest in absolute terms, fiscal surpluses in such countries as Australia and Sweden would on present trends eliminate their central government debt ahead of those in the United States (Graph IV.1). At the other end of the spectrum, Japan's fiscal deficits are producing the world's biggest government bond market, while those of France and Spain are serving to maintain the size of the euro-denominated market. At the same time, some emerging market countries are having to increase their public sector debt to finance the recapitalisation of distressed banking systems.

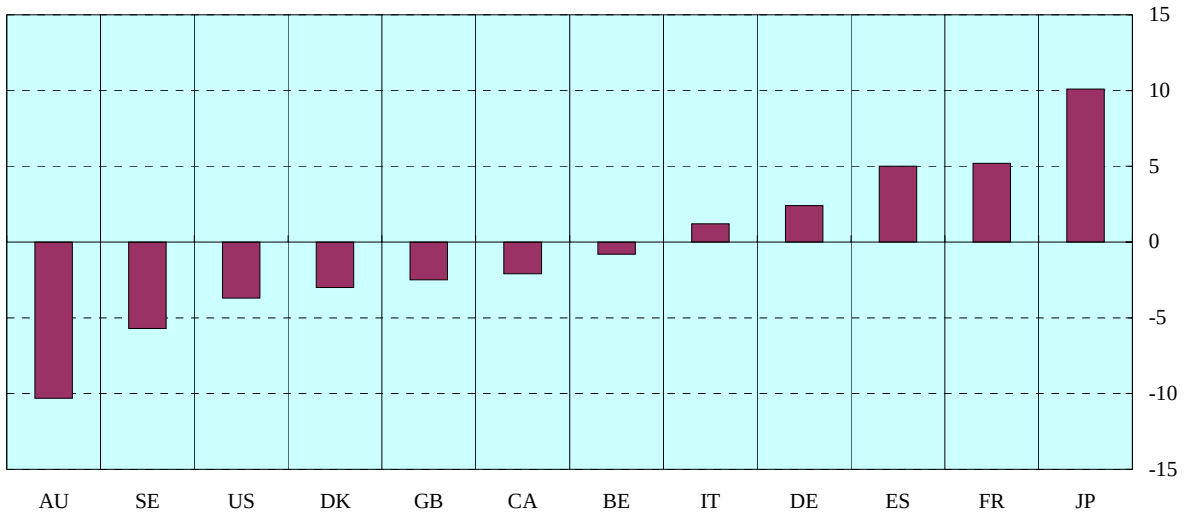
As different as their fiscal circumstances may be, most governments have revealed a common interest in fostering market liquidity. In pursuing this goal, policymakers have regarded various dimensions of the size of the market as key considerations. In several industrial countries, where budget surpluses are shrinking debt, the authorities are trying to preserve liquidity by maintaining gross issuance in specific securities even as net issuance in all securities declines. The finance ministries in emerging market countries view growing debt as providing an opportunity to develop domestic bond markets – private as well as government – to reduce not only the cost of borrowing but also reliance on overseas financing in foreign currency.

After briefly describing the emergence of liquidity in some markets, this article takes up the question of the critical size for a liquid market. It then discusses one way of creating size: through lumping together different types of debt. Next it characterises the trade-off between size and crowding-out. Finally, it raises some issues concerning the transition in growing and shrinking markets.

Graph IV.1

Estimated net issuance in 2000 as a proportion of outstanding debt

Net issuance of government bonds as a percentage of outstanding debt



Sources: Salomon Smith Barney; JP Morgan.

The search for liquidity

Government bond markets in advanced economies arose as a by-product of the need to finance fiscal deficits. National treasuries learned that funds could be obtained more reliably and cheaply if issuance procedures, secondary market organisation and settlement mechanisms were adapted to the convenience of private investors and dealers. As market liquidity developed, government bonds became benchmarks for pricing other securities, provided means of hedging and positioning in both duration and volatility, and served as bases for futures market contracts and as collateral for secured borrowing. The benchmark role, however, does not appear to be a necessary one for all countries: the US corporate bond market, for example, was already fairly liquid before World War I, when there was little government debt. Nonetheless, a government bond market may currently be more necessary in emerging markets, since they have few well rated private firms to provide alternative benchmarks.

In emerging markets, large fiscal deficits have not always led directly to liquid bond markets.[57] In the past, governments typically borrowed abroad or placed paper with local banks rather than issue bonds in the local market. However, this has begun to change, as governments have recently been issuing more medium- and long-dated paper in their domestic markets, especially in Latin America, where the maturities of debt paper had been overwhelmingly short-term. In Asia, the development of government bond markets has been held back less by high and variable inflation than by the dearth of government paper, and the financial aftermath of the East Asian crisis has changed that. The Korean authorities, for example, had 93 trillion won ($82 billion) in domestic public sector debt outstanding at end-June 2000, including a three-year benchmark issue that is now served by a futures contract. In June 1998, the Thai Financial Institutions Development Fund began an 800 billion baht ($21 billion) programme to issue government-guaranteed bonds in maturities of up to 15 years. Even so, issuing the debt has been easier than achieving active secondary trading, which may require a minimum market size, as suggested below. As a result, in some emerging markets, the benchmark interest rate is derived merely from government auctions rather than from secondary markets.

If it matters for liquidity, size can be created through "overfunding". The authorities in several jurisdictions have issued bonds in the absence of any financing need. Singapore's government and the Hong Kong Monetary Authority had by mid-2000 built up outstandings of $20 billion and $14 billion of government and Exchange Fund paper, respectively, in part to serve as benchmarks. The proceeds of overfunding need to be invested in other assets. One issue concerns the choice of such assets: Hong Kong and Singapore choose foreign currency assets but other choices are possible. In some cases, the lack of a suitable investment may argue against overfunding.[58]

Does size matter for liquidity?

The relationship between size and liquidity is complicated by the fact that size has several dimensions. In dealer markets, liquidity is often supplied by market-makers who not only provide quotes but also take positions. How far size matters for liquidity thus hinges on the various economies of scale in market-making. Those managing debt in the face of fiscal surpluses emphasise *gross* issuance in *specific* securities by concentrating issuance in fewer maturities, by holding auctions less frequently and by buying back illiquid issues. However, if important fixed costs are involved in the production of information about the future path of interest rates, the size of the whole market across maturities also matters. Similarly, if there are scale economies in extracting information from order flows, the scale of trading activity may matter.

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[57] See the special feature "Market liquidity and stress: selected issues and policy implications" on pages 38-48, for a working definition of liquidity in terms of tightness, depth, immediacy and resilience.

[58] To the extent that the proceeds of overfunding are invested in US Treasury securities, the shrinkage of the stock of these securities in private hands accelerates.

Table IV.1

Measures of size and liquidity

	Outstanding central government debt (end-1997) [1]	Yearly cash and futures turnover (1997) [2]	Turnover ratio[3]	Bid-ask spreads for on-the-run issues[4]
United States	2,741	103,829	37.9	3
Japan	1,855	31,735	17.1	7
Italy	971	10,455	10.8	6
Germany	653	6,600[5]	10.1	4
France	484	18,634	38.5	10
United Kingdom	459	6,516	14.2	4
Canada	210	6,428	30.6	5
Belgium	191	975	5.1	5
Netherlands	168	450	2.7	...
Sweden	102	4,763	46.8	15
Switzerland	27	215	8.1	10

[1] Nominal value outstanding; in billions of US dollars. [2] In billions of US dollars. [3] Defined as yearly trading volume divided by outstanding volume. [4] On-the-run issues of 10-year bonds. The spreads are in basis points and apply to inter-dealer transactions. [5] Only futures turnover of bund contracts (LIFFE).

Sources: Salomon Smith Barney; H Inoue, "The Structure of Government Securities Markets in G10 Countries: Summary of Questionnaire Results", in *Market Liquidity: Research Findings and Selected Policy Implications*, Committee on the Global Financial System, Basel, May 1999.

Size does seem to matter, although it is clearly not the only determinant of liquidity. The larger the outstanding stock of publicly issued central government debt, generally the higher the turnover in cash and futures trading (Table IV.1). And the higher the turnover, the better the liquidity, as measured by the bid-ask spread of benchmark 10-year issues (Graph IV.2).[59] The narrowing of this spread may reflect the ability of market-makers to reduce their inventory risks as trading activity rises. Nevertheless, other factors evidently also play a role, including: holdings by government accounts and other investors who do not trade actively; the amounts outstanding of benchmark issues; the trading microstructure; taxes; arrangements for repurchase; and clearing and settlement practices.[60]

Judging by the success of government bond futures markets as well as by bid-ask spreads in G10 markets, there may be a size threshold that lies around $100-200 billion. Below this, sustaining a very liquid government bond market may not be easy. If so, the prospects for liquid government bond markets in Asia could be limited by the size of outstanding central government debt. Seoul's $82 billion market, for example, may eventually cross the threshold, but such markets as Bangkok's and Manila's with under $20 billion each may still have a way to go.

[59] The bid-ask spread measures only one dimension of transaction costs since it does not measure depth or resilience of the market with respect to absorbing large order flows. See *Market Liquidity*, Committee on the Global Financial System (Basel, March 2000), pages 13-15.

[60] See *How should we design deep and liquid markets? The case of government securities*, Committee on the Global Financial System (Basel, October 1999), and APEC Collaborative Initiative on the Development of Domestic Bond Markets, Compendium of Sound Practices: Guidelines to Facilitate the Development of Domestic Bond Markets in APEC Member Economies (September 1999).

Creating size through lumping

An important but often neglected policy choice is between splitting and lumping various forms of government debt. This choice has a number of dimensions: few versus many maturities, nominal versus inflation-indexed bonds, and one versus many public sector obligors.

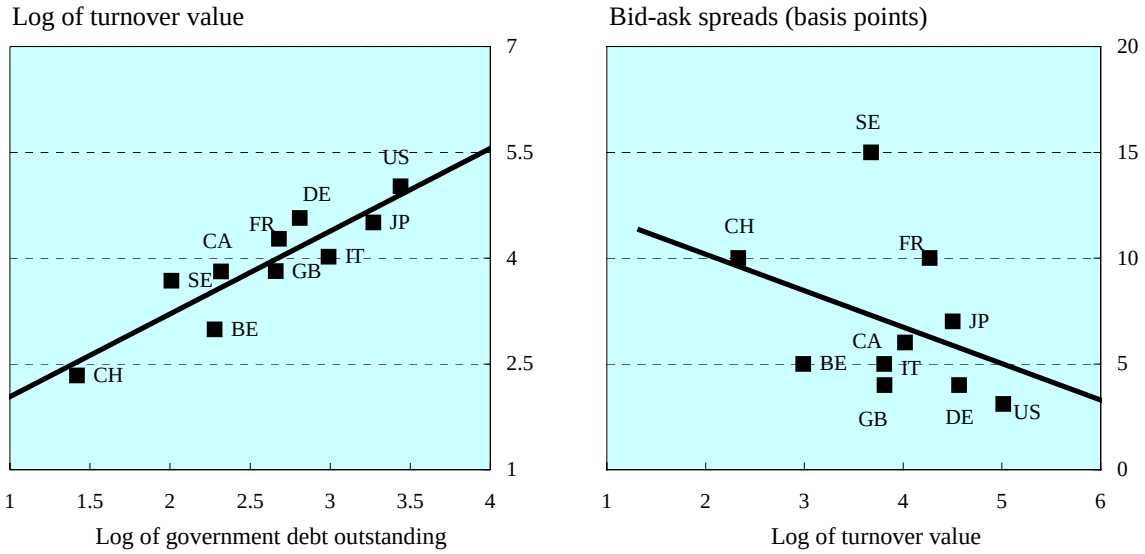
In the case of industrial countries, there seem to be four maturities of choice: two, five, 10 and 30 years. France, Germany and the United States each conduct regular auctions of straight nominal bonds for only these maturities. Italy and Spain have both opted for five maturities (including 15 years for Spain), while the United Kingdom now issues conventional gilts in mostly 10-year and 30-year maturities. In addition to nominal bonds, the governments of Canada, France, the United Kingdom and the United States have committed themselves to issuing inflation-indexed bonds.

The choice between concentrating issuance for benchmarks, on the one hand, and supplying a continuous yield curve while lengthening maturities, on the other, seems initially to have been made without due regard to the benefits of big, liquid benchmarks. The reason is that corporations seeking pricing bases and institutional investors looking to match long-duration liabilities generally lobby for a variety of long-term issues. Confronted by fiscal surpluses, however, governments now find that achieving robust liquidity requires that issuance be limited to very few renewable maturities. Hence, the US Treasury has given up the three-year note, while the UK auction calendar now indicates an increased concentration of issuance in the 30-year gilt. Among emerging market countries, Mexico has treated long maturities with some caution, only recently issuing a three-year bond, while Thailand, with its better inflation record, has stretched out issuance to as long as 15 years.

The issuance of specific public sector bonds not carrying the full backing of the government may serve to divide the market into relatively less liquid segments. Besides the central government, other public sector obligors in Australia, Canada, France and the United States have issued substantial amounts of debt (Table IV.2). Recent examples include bonds to recapitalise banks, which may be backed by deposit insurance proceeds (eg the FICO bonds used to recapitalise US savings and loans) or the assets of an asset management company (either centralised as in Malaysia or one per bank as in China).

Graph IV.2

Size and liquidity



Sources: Salomon Smith Barney; H Inoue, "The Structure of Government Securities Markets in G10 Countries: Summary of Questionnaire Results", in *Market Liquidity: Research Findings and Selected Policy Implications*, Committee on the Global Financial System, Basel, May 1999.

Table IV.2

Outstanding government securities (end-1997)

	Total		Central government	Government agency and government-guaranteed	State and local government
	in billions of US dollars	as a % of GDP	as a % of total public debt		
United States	6,652	80	41	43	16
Japan	2,135	51	87	9	4
Germany	765	36	85	6	9
Italy	987	85	98	2	.
France	668	46	72	27	1
United Kingdom	459	35	100	.	0
Canada	324	52	65	.	35
Netherlands	169	45	99	.	1
Belgium	203	84	94	6	.
Denmark	90	54	100	.	.
Spain	193	35	89	.	11
Sweden	103	44	99	.	1
Australia	82.2	20	71	29	.

Sources: Salomon Smith Barney; national data.

If such bonds are imperfect substitutes for straight government debt – which is true even of explicitly guaranteed bonds[61] – then the liquidity of the government bond market can suffer. In such circumstances, governments might wish, on the one hand, to lump the debt together. On the other hand, the debt might be split more cleanly by removing credit and liquidity support to agencies, as recently proposed by the US Treasury. Not resolving the ambiguity creates the risk of arriving at the worst of both worlds: uncertainty about the government guarantee ex ante leads to higher rates and reduces liquidity even though in sharply adverse circumstances such institutions might wind up being supported ex post.

The trade-off between size and crowding-out

It is important to realise that bigger is not always better. In the case where the supply of government debt is determined by deficits, any benefits from the government bond as a pricing benchmark and hedging instrument can be lost if the government crowds out private borrowing. Conversely, a reduction in government borrowing can create room for private borrowers: for instance, a remarkable surge in corporate issuance has accompanied the recent slowdown in government issuance in the United States and Europe (Graph IV.3). Nevertheless, heavy issuance of Japanese government bonds did not seem to prevent domestic corporate bond issuance from hitting a record high in 1998.

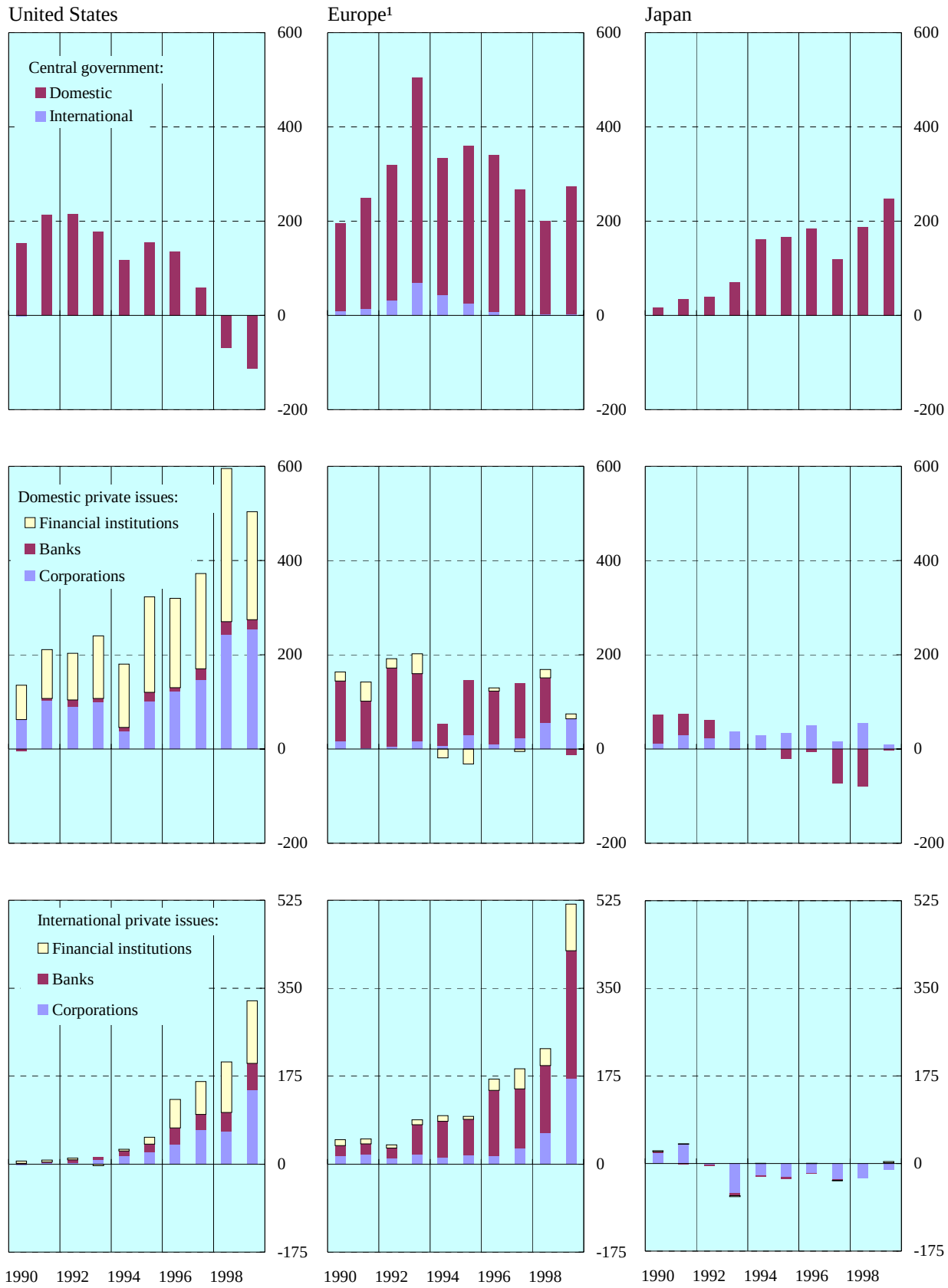
Moreover, private markets have shown a capacity to produce their own benchmarks and even to displace entrenched government instruments. The US experience in the early 1980s is a case in point.

[61] See the yield spread between the government-guaranteed bond issued by the German financial institution Kreditanstalt für Wiederaufbau and the German government bond (see the 1999-2000 BIS *Annual Report*, p 114, Graph VI.8).

Graph IV.3

Net issuance of domestic and international bonds and notes

In billions of US dollars, by country of residence



¹ EU 15 countries, Norway, Switzerland and Turkey.

Source: BIS.

At first, the US Treasury bill rate was the pre-eminent short-term money rate, with active markets in both cash and futures. In the course of the 1980s, however, the private bank rate known as dollar Libor in important ways displaced its public counterpart in the futures and options markets and as a benchmark for pricing private credit. The longer-term version of Libor is the fixed rate leg of interest rate swaps. There is no obvious reason why two-, five- and 10-year swaps could not do to US Treasury notes what three-month Libor did to the three-month Treasury bill, even without the retirement of Treasury debt.

To some degree, interest rate swaps already seem to be displacing Treasury securities as pricing benchmarks and hedging instruments in the US dollar market, although not without some difficulty. An extraordinary widening of spreads on these swaps during summer 1999 was in part the result of earlier shifts in liquidity that made on-the-run Treasury issues less useful as hedging instruments.[62] Hence, when corporate bond issuance surged, dealers turned to the swaps market in a one-sided effort to hedge unusual amounts of inventory. The swaps market, however, was new to such hedging activity and did not seem to possess the market-making capacity to accommodate these demands. Since then, market participants have turned to the swaps market for their hedging and benchmark pricing needs.

Liquidity during the transition in shrinking and growing markets

How will liquidity adjust in the short run to the changing supplies of tradable government debt? In growing markets, increased supply should enhance liquidity and contribute to smooth market functioning as long as other structural conditions are present. In markets that are already well developed, it might be thought that arbitrage activity would ensure that yields are little affected by declining supply. In practice, however, liquidity requires market-making capital and this capital is allocated on the basis of a forward-looking calculation. Hence, liquidity may anticipate rather than follow the size of markets.

In the US Treasury market, recent developments suggest that forward-looking capital allocation has been important in the ebbing of market liquidity. In January, large budget surplus projections and the announcement of final rules for the Treasury's buyback programme seemed to cause investors to focus on the supply of securities. In early February, changes in the Treasury's auction calendar led to a sharp decline in yields, especially at the long end. In an indication of a deterioration of liquidity, so-called "specials", in which a specific security becomes unusually expensive to borrow, began to occur more frequently than before. While the US Treasury's selective buyback strategy seems to be substituting for the "relative value" arbitrage that investment funds and proprietary trading desks used to provide, thereby eliminating pricing anomalies, uncertainty about the market's future seems to have contributed to a withdrawal of market-making capital and a drying-up of liquidity.

In the markets of Japan and the euro area, liquidity remains highest in 10-year maturities, particularly in the benchmark Japanese government bond and the on-the-run German bund. Since 1999, the Japanese government has shifted issuance to the five-year maturity and away from the 10-year in an effort to create liquidity also in another part of the yield curve. It remains to be seen whether the anticipation of an enlarged market segment will be sufficient to attract the market-making capital needed for liquidity. In Europe, some liquidity can now be detected in the two-year and five-year issues of France, Germany and Italy. These countries have concentrated their recent issuance in these sectors to promote liquid benchmarks in these parts of the curve.

In emerging markets, there is a risk that the opportunity presented by costly financial sector recapitalisations will not be seized. The understandable reluctance of finance ministries to take on the costs explicitly – by including them directly in the fiscal deficit – may leave bond markets split and thus less liquid than they might be. Especially in medium-sized to small markets, national obligations best serve financial development if they take the most straightforward and homogeneous form.

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[62] See the discussion on credit premia and liquidity in the Overview of the February 2000 issue of the *BIS Quarterly Review*, pages 7-8.

Composition of US dollar foreign exchange reserves by instrument

Ben Fung and Robert N McCauley

The uncertain but serious prospect of a shrinkage of the stock of outstanding US Treasury securities poses a challenge to managers of official foreign exchange reserves. More than three quarters of such reserves are held in US dollars, traditionally mostly in US Treasury securities. This box analyses the instruments in which central banks have invested their dollar reserves in recent years. The data assembled suggest that they have been shifting away from US Treasury securities for several years.

Instrument composition of US dollar reserves in 1989 and 1999

In percentages

	End-1989[1]			End-1999[2]		
	Short-term	**Long-term**	**Total**	**Short-term**	**Long-term**	**Total**
Treasury securities	19	45	64	16	42	58
Other assets	27	9	36	28	14	42
Deposits in the US	3			3		
Money market paper	6			11		
Offshore deposits	18			14		
Agency securities		2			5	
Corporate bonds		0			1	
Equity		7			8	
Total	**46**	**54**	**100**	**44**	**56**	**100**
Memorandum items:						
Share of Treasury securities in assets of the given maturity	*41*	*83*		*36*	*75*	
Total identified US dollar reserves (billions)			*403*			*993*

[1] Figures for US Treasury securities, deposits and money market paper are from the US *Treasury Bulletin*, Tables CM-I-2 and IFS-2. Figures for offshore US dollar deposits are from the BIS international banking statistics. Figures for corporate bonds, agency securities and equity are from the US Treasury Department, *Report on Foreign Portfolio Investment in the United States as of December 1992*. [2] Figures for agency securities and corporate bonds were obtained by cumulating reported transactions to benchmark data. The figure for equity was estimated by also using data from R Scholl, "The International Investment Position of the United States at Yearend 1999", US Department of Commerce, *Survey of Current Business* (July 2000).

While the currency composition of official reserve holdings has received a good deal of attention over the years, little has been written regarding the composition of reserves by instrument. A breakdown of a central bank's portfolio by instrument can shed light on the extent of the bank's risk aversion and the portfolio's evolution over time. Our analysis, restricted to US dollar reserve holdings, is based not on a bottom-up aggregation of individual central bank portfolios but rather on a top-down approach using two reporting sources. It covers only identified investments in the United States, as captured in the US Treasury International Capital reporting system, and dollar deposits held outside the United States in banks in the BIS reporting area.① Not included are dollar securities held outside the United States, such as eurodollar bonds and notes of highly rated governments.② Overall, the identified official dollar holdings at end-1999 represent over 70% of estimated dollar reserves of about $1.4 trillion and over half of total reserves of $1.7 trillion.

① US Treasury data cover foreign official institutions, including international and regional organisations such as the BIS, and various investment funds such as the Abu Dhabi Investment Authority, the Government of Singapore Investment Corporation and the Fondo de Inversiones de Venezuela. This definition is quite similar to that for official monetary authorities used by the IMF but broader than the one used by the BIS. ② Total eurodollar bonds and notes outstanding as of June 2000 amounted to $2.6 trillion; see Annex Tables 13A and 13B. Almost a fifth of all international bonds are issued by the governments and state agencies favoured by central banks for investment; see Tables 12A and 12C.

The table shows the composition of US dollar reserves by instrument in 1989 and 1999.[3] The first row reports the holdings of US Treasury securities. The other rows report the holdings of other investments, including bank deposits, money market paper, other debt securities and equity. This table provides a snapshot of the aggregate US dollar reserve portfolio in 1989 and 1999. Over this 10-year period, total identified US dollar reserves more than doubled from $404 billion to $995 billion.

The share of dollar reserves invested in US Treasury securities has fallen from 64% in 1989 to 58% in 1999. This ratio remained between 62% and 65% until 1997 and has dropped only in the last two years. The decline was most marked among securities with an original maturity in excess of one year, where Treasury securities dropped from 83% to 75%. Holdings of debt securities of government-sponsored enterprises like Fannie Mae and Freddie Mac increased sevenfold between 1989 and 1999 in dollar terms, although their share only rose from the 2-3% range to over 5% during this period. Corporate bond holdings have risen sharply but remain below 1% of total holdings. At the short end of the yield curve, Treasury bills have long since lost out to bank deposits as the favoured habitat of reserve managers; among securities with a maturity of more than one year, the process of diversifying away from Treasury securities is less advanced.[4]

Perhaps surprisingly, equity holdings by official institutions remained the largest single class of assets among long-term non-US Treasury securities holdings. Notwithstanding net sales during most of the 1990s, estimated capital gains lifted overall holdings. In the past, such holdings have been confined to relatively few investors, but their numbers look set to grow.

The pace of asset diversification may be understated, owing to the limitation of the data used. As mentioned earlier, a significant portion of estimated dollar reserves at end-1999 was not included in the analysis. This is not the case in 1989, when only a negligible amount of dollar reserves was unidentified. If all the unidentified dollar reserves were held in non-US Treasury securities, the share of US Treasury securities would fall from 64% to just 43%.[5]

Looking at the reported transactions in the first six months of 2000, central banks appear to be diversifying away from US Treasury securities at an accelerating rate. Net foreign official purchases of all long-term securities, most notably agency securities, have increased. Central banks purchased over $18 billion worth of agency securities, with considerably higher trading volume. Net purchases of US Treasury securities were substantially less, amounting to only $12 billion. In fact, the US Treasury data show that central banks have been buying more agency securities than US Treasury securities since 1998. Net purchases of equity securities were over $900 million, reversing the trend of net sales into a rising market since 1996.

In conclusion, within their US dollar portfolios, central banks are diversifying away from US Treasury securities. Recent evidence suggests that they are picking up the pace of this diversification. One can argue, on the basis of available scenarios of the evolution of outstanding US Treasury securities, that their supply may fall short of central banks' demand for them. But it should be borne in mind that changes in relative yields on US Treasury securities and changes in relative liquidity will tend to balance demand and supply.

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[3] "Long-term securities" refer to securities which have an original term to maturity in excess of one year or which, as in the case of equities, have no stated maturity date. For example, a Treasury note with six months remaining to maturity is still considered as a long-term security. Y Amihud and H Mendelson show that a shift from a bill to such a long-term security offers an investor a yield pickup, assuming the coupon security is held to maturity. See Y Amihud and H Mendelson, "Liquidity, Maturity, and the Yields on U.S. Treasury Securities," *Journal of Finance*, Vol 46(4), September 1991, pp 1411-25. [4] In fact, holdings of short-term US Treasury securities decreased in dollar terms from the peak in 1996 to 1998, recovering only in 1999. This may reflect the fact that central banks also hold foreign exchange reserves for liquidity (intervention) purposes. Central banks may have used their US dollar reserves to cope with the crises in 1997 and 1998. [5] This assumption allows an assessment of the maximum pace of asset diversification over this period by ignoring the possibility of unidentified central bank holdings of US Treasury securities, perhaps through external managers.

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V. Special feature: Hedge funds

In early 1949, Alfred Winslow Jones, a sociologist and financial journalist, set up an investment partnership that was eventually to be regarded as the first hedge fund. His innovative strategy used a mix of short and long stock market positions with leverage, which emphasised the effect of security selection on the portfolio's performance while neutralising the effect of market-wide movements (hence the term "hedge"). Despite a solid performance record, Mr Jones's partnership remained a little-known fund on the fringes of Wall Street and his strategy found few imitators until a 1966 financial press article popularised it among the broad investor community. The first boom of the hedge fund industry was under way.[63] Since that time, financial market growth and deepening have been phenomenal, supported by a global trend towards market liberalisation and the rapid development of financial technology. Opportunistic and nimble investment vehicles, such as hedge funds, have been well positioned to take full advantage of the new opportunities created in this environment. As a result, the industry has grown in both size and importance while offering generous rewards to investors and principals.

At the same time, however, the industry has also acquired notoriety, having been associated, directly or indirectly, with nearly every major episode of financial market turmoil during the 1990s. In September 1998, almost 50 years to the day since the inception of Jones's fund, the financial troubles of another hedge fund seemed to be at the very centre of a storm that threatened the stability of the world's financial system. The potential failure of Long-Term Capital Management, which featured some of the most revered names in finance among its partner list, threatened to push already strained markets over the threshold of a systemic crisis.

This episode highlighted the potential for disruption to financial market functioning from the funds' activities, and prompted a broad reassessment, in both official and private forums, of the appropriateness of the operating framework of hedge funds. It has also influenced the attitudes of counterparties, creditors and, indeed, the industry itself towards the quantity and quality of information disclosed by hedge funds and the practices governing their business transactions. In a sense, the events of 1998 can be seen as marking the start of a new period in the evolution of the hedge fund industry. A period characterised by greater focus on consistency of performance and less emphasis on the mystique and personality cult of fund managers with fabled investing skills.

Structure, characteristics and attractiveness of hedge funds

Hedge funds are investment companies with legal and organisational structures conducive to an aggressive investment style. They typically operate as limited partnerships or choose to register offshore, in order to minimise reporting and regulatory requirements that apply to more widely marketed investment companies such as mutual funds. To minimise liquidity requirements, the funds place restrictions on withdrawals by investors. More importantly, the incentive structure for the managers encourages aggressive investment strategies. Management fees are highly sensitive to performance, which is in turn measured in absolute terms rather than relative to a peer group as is

[63] For a more detailed account of Alfred Jones's fund and the early years of the hedge fund industry, see Caldwell (1995).

often the case with other professional asset managers. In addition, fee structures often contain "high watermark" provisions that require the manager to make up for losses before receiving further incentive fees. In return, fund managers typically invest a substantial amount of their own money in the fund.

These attributes imply constraints on the size of the fund both because of legal restrictions on the maximum number of investors and on permitted marketing channels and because the inherent inertia of larger portfolios can cramp the opportunistic investment style. The absence of reporting requirements for most hedge funds means that there are no comprehensive data on the size of the industry. Estimates by the main commercial suppliers of hedge fund information range between 2,500 and 5,000 funds with between $200 and $300 billion in assets under management.[64] According to one of these sources, the average fund had just under $100 million in assets under management at end-1998, with more than 50% of all funds being smaller than $25 million. There were only 32 funds with more than $1 billion in assets under management. Nevertheless, the two largest families of macro funds managed sums in the neighbourhood of $20 billion each at their peak in mid-1998.

Yet the size of assets under management alone is not an accurate indicator of the potential impact of a single player on financial markets, since control over a much larger portfolio can be obtained through leverage. Indeed, more than other collective investment vehicles, hedge funds make use of leverage to enhance the potential profitability of their positions. Survey evidence indicates that three quarters of all funds make use of leverage, although only 16% volunteer that they operate with gearing ratios greater than 2:1. According to a different survey that focuses on a group of larger hedge funds, roughly one quarter of the equity invested in these funds is leveraged at least 10 times and one half is leveraged less than three times.

As is often the case in the professional portfolio management industry, hedge funds market themselves as following specialised investment strategies, or *investment styles*. It is useful to distinguish between two broad categories of investment style based on the fundamental investment philosophy. Funds in the first category take directional positions in expectation of an appreciation or decline in a specific asset's price. These strategies represent bets that existing relationships between asset prices are not sustainable. The "global macro" fund style is representative of this category. The second category comprises styles that aim at exploiting pricing anomalies or temporary distortions of securities' prices using strategies that bear closer resemblance to that followed by Alfred Jones. These funds use diversified strategies that combine both long and short positions on similar securities, the prices of which they judge to be misaligned, in the expectation that historical relationships will eventually reassert themselves. Leverage is also used to magnify potential profits since the pricing discrepancies that the funds attempt to exploit are typically very narrow. The strategy often relies on financial derivative instruments (frequently contracted in the over-the-counter market) to help insulate portfolio returns from other market risk factors unrelated to the specific pricing anomaly that is being exploited. Investment styles such as "market neutral" and "relative value arbitrage" fall into this category.[65]

The hedge fund industry has experienced rapid growth over the past several years, with the number of funds increasing each year since 1988. At end-1999, some industry observers estimated that there were more than 5,000 funds in operation, a fourfold increase from 10 years earlier. Assets under management have grown at twice this pace to surpass $300 billion. One remarkable feature of this steady growth is that the industry as a whole has weathered adverse market conditions relatively well,

[64] Assets under management refer to the sum of contributions by the hedge fund's principals and outside investors.

[65] Hedge funds share many of the above characteristics, including their investment styles, with other types of so-called highly leveraged institutions (HLIs). The proprietary trading operations of investment banks and securities companies are, for instance, virtually indistinguishable from hedge funds along many of these dimensions. The focus on hedge funds is nevertheless justified to the extent that they operate as separate institutions. They are thus distinct from other entities that may be subject to some degree of oversight – either because they fall under the supervisory umbrella or because they are subject to more demanding disclosure requirements.

Table V.1

Number, size and leverage of funds

		1990	1994	1995	1996	1997	1998	1999	2000[1]	Leverage
Global macro	Number of funds	16	80	68	69	74	74	66	66	161%
	Assets under management[2]	4.5	28.8	24.0	31.4	32.2	30.4	24.9	14.3	
Global established	Number of funds	42	179	196	239	284	314	291	329	142%
	Assets under management[2]	1.5	6.6	8.9	12.1	18.4	25.0	37.7	40.7	
Global emerging	Number of funds	24	166	191	247	218	154	142	148	139%
	Assets under management[2]	0.7	13.0	13.2	17.9	20.4	8.7	10.2	10.2	
Long only	Number of funds	–	10	11	21	27	25	25	24	223%
	Assets under management[2]	–	0.1	0.2	0.5	0.4	0.3	0.6	0.5	
Short sellers	Number of funds	7	18	14	18	20	22	20	21	113%
	Assets under management[2]	0.2	0.6	0.5	0.5	0.6	0.8	11.8	1.1	
Sectoral	Number of funds	1	22	35	54	80	83	100	133	124%
	Assets under management[2]	0.0	0.2	0.7	1.9	3.4	3.0	5.0	9.2	
Market neutral	Number of funds	20	148	179	227	276	288	277	292	256%
	Assets under management[2]	0.9	6.4	7.5	12.9	23.8	26.3	27.6	32.0	
Event-driven	Number of funds	20	66	85	118	135	129	118	133	133%
	Assets under management[2]	0.9	3.9	4.7	6.7	10.4	11.6	13.1	16.6	
Total (excl funds of funds)	Number of funds	130	689	779	993	1,114	1,089	949	1146	168%
	Assets under management[2]	10.2	70.3	71.2	99.2	132.1	127.9	130.9	121.9	
Funds of funds	Number of funds	33	198	232	284	314	296	318	346	114%
	Assets under management[2]	1.5	11.3	11.5	15.3	22.3	21.7	25.0	27.4	

Note: Leverage refers to the ratio of the sum of the funds' portfolio assets and liabilities to total assets under management, as reported to MAR Hedge by the funds. The reported figure corresponds to the size-weighted average for all the funds in each group that reported their leverage to MAR Hedge.

[1] Figures for the year 2000 refer to September. For all other years they refer to December. [2] In billions of US dollars.

Sources: FSF; MAR Hedge; author's calculations.

even the volatility that has characterised markets for most of this year. Indeed, on average, hedge funds have generated handsome returns for their investors, outpacing market benchmarks as well as other investment vehicles such as mutual funds. The fact that this investment performance typically exhibits a low correlation with broad market indices is an additional attractive feature of hedge fund investments. This last characteristic is a direct consequence of an opportunistic investment style that favours dynamic investment strategies and high portfolio turnover compared with other types of institutional investor that typically operate with a longer investment horizon. Hence, hedge funds offer considerable scope for yield enhancement and diversification to the sophisticated investor, at the cost of greater risk.[66] This risk is evident not only from the relatively high volatility of typical hedge fund returns but also from the high attrition rates in the industry. It is estimated that each year on average 7% to 10% of all funds cease operations.

[66] See Fung and Hsieh (1999).

Table V.2

Financial performance of hedge funds

	1994-97		1998		1999		2000	
	Return	**Sharpe ratio**	**Return**	**Sharpe ratio**	**Return**	**Sharpe ratio**	**Return**	**Sharpe ratio**
Convertible arbitrage	9.66	1.18	– 4.41	– 1.10	16.04	5.37	34.53	9.61
Dedicated short bias	0.26	– 0.33	– 6.00	– 0.35	–14.22	– 1.29	–19.55	– 1.21
Emerging markets	12.32	0.39	–37.66	– 1.61	44.82	2.05	8.23	0.14
Equity market neutral	9.86	1.22	13.31	2.48	15.33	5.45	19.25	9.18
Event-driven	15.18	2.35	– 4.87	– 0.70	22.26	4.43	10.73	1.35
Fixed income arbitrage	9.36	1.45	– 8.16	– 1.49	12.11	3.47	6.26	0.27
Global macro	20.68	1.10	– 3.64	– 0.45	5.81	0.07	3.32	– 0.22
Long/short equity	12.62	0.89	17.18	0.74	47.23	2.82	9.18	0.15
Managed futures	4.68	– 0.03	20.64	1.20	– 4.69	– 1.13	–10.15	– 3.48
All hedge fund styles	15.69	1.16	– 0.36	– 0.42	23.43	1.91	8.08	0.18
S&P 500	19.15	1.23	26.10	0.99	18.75	1.08	– 2.50	– 0.45
MSCI world equity	11.78	0.64	22.54	0.90	22.01	1.43	–10.96	– 1.06
Merrill Lynch corporate master bond index	– 0.26	– 0.83	5.45	0.10	–12.02	– 3.91	4.24	– 0.34

Sources: CSFB/Tremond; Datastream; author's calculations.

Hedge funds and episodes of financial market turmoil

Before discussing the role of hedge funds in different episodes of market turmoil, it is useful to distinguish between two types of potential disruption to market functioning arising from the activity of any financial institution. Financial stability can be compromised when a market player is able to amass enough resources to single-handedly influence specific asset prices or tactically exploit its influence on other participants' behaviour to tilt market momentum in favour of its own positions. In such circumstances, both the information content of market prices and their relationship with fundamentals are severely weakened, possibly giving rise to heightened price volatility. A quite different type of disruption arises when a highly leveraged institution with large and concentrated positions is confronted with a liquidity or solvency crisis. In this case, not only may the functioning of the markets where the institution has been particularly active be disrupted, but the institution's counterparties, which helped it finance these positions, are also likely to experience serious losses. In both cases, the costs of misjudged investment decisions are likely to spread well beyond the equity holders of the leveraged institution. Indeed, depending on the nature of exposures and prevailing market circumstances, there may potentially be systemic implications. Hedge funds have been linked to both types of market disruption.

The 1992 ERM crisis

The ERM crisis was for many a milestone event that highlighted the ability of financial markets to disrupt policy targets. In particular, the fact that mounting speculative pressures forced several currencies to breach their respective fluctuation limits under the ERM, despite unprecedented amounts of official intervention, seemed to demonstrate the capacity of markets to overwhelm even the most formidable defences. The well publicised role played by the Quantum family of macro funds during this episode helped to elevate hedge funds near to the top of the list of those market players regarded

as having this capability. Public claims by the fund's manager of impressive profits from taking short positions against the pound sterling can be corroborated by the co-movement of Quantum's net asset value with the UK currency, as depicted in Graph V.1.[67] Furthermore, this episode helped illustrate the increasing significance of non-bank investors in a foreign exchange market which had traditionally been dominated by interbank activity.

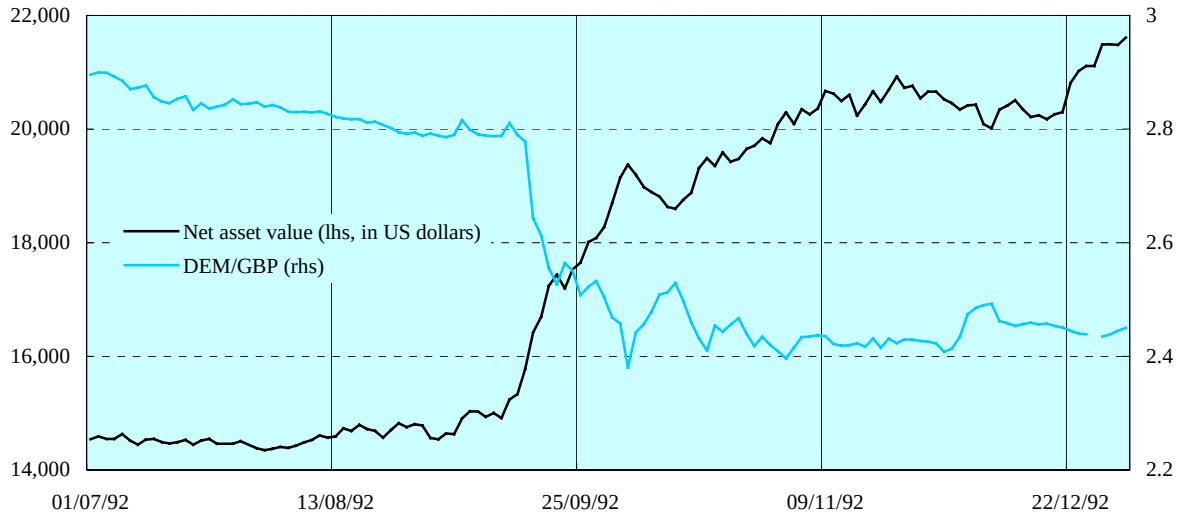
The Asian currency crises of 1997, and beyond

The background to the currency crises that rippled through the emerging economies of Southeast Asia during the second half of 1997 bears some similarities to that of the ERM crisis. Namely, the combined influence of external shocks and domestic financial imbalances undermined the credibility of exchange rate targets and eventually led to their abandonment. In contrast to the ERM episode, however, the role of hedge funds in this latter case has been less clear. Officials from the affected countries have often singled out hedge fund activity as a major factor behind the pressures that culminated in the devaluation of many currencies in the region. Anecdotal evidence also lends support to the view that individual funds put in place short positions on Asian currencies in the expectation that their US dollar parities would not be sustainable. To date, however, there has not been concrete evidence of large-scale involvement of hedge funds, certainly not to a degree that could account for the total cost to official reserves from defending the national currency. Statistical estimates of the aggregate short positions of the largest macro hedge funds on the affected currencies never exceed the equivalent of $11 billion during 1997, mostly concentrated on the Thai baht.[68] This contrasts with the nearly $35 billion reduction in lending by BIS reporting banks to the region during the second half of 1997.

Hedge funds reportedly maintained a presence in the Pacific region during most of 1998 and intermittently exerted pressure on the Australian and New Zealand currencies as well as Hong Kong's financial markets. Several local market observers have pointed to a build-up of short currency positions by hedge funds through forward sales and derivatives. These plays were often combined with matching short positions in the bond or equity market designed to profit from interest rate

Graph V.1

The Quantum Fund and the pound sterling in 1992



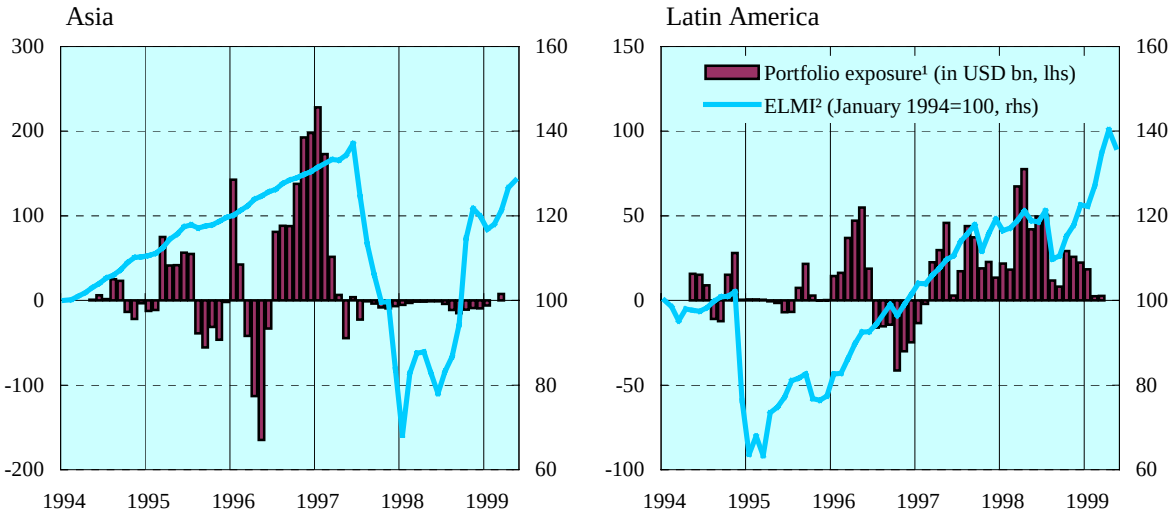
Sources: Reuters; Financial Times; national data.

[67] Net asset value (NAV) is a measure of the fund's net worth akin to that of the share price for a company.

[68] See Fung et al (2000).

Graph V.2

Estimated portfolio exposure of hedge funds to emerging markets



¹ Calculated as the product of the fund size and the sensitivity of reported portfolio returns to the market index. ² JP Morgan Emerging Local Markets Index.

Sources: Managed Accounts Report Inc; JP Morgan Securities Inc.; BIS calculations.

increases in defence of the exchange rate. Moreover, officials in the region have also pointed to questionable practices by the funds and other players, such as engaging in collusive behaviour and spreading selective or false information, that verge on unethical market conduct.[69]

While evidence of this activity has been mainly anecdotal, Graph V.3 presents some circumstantial support for the view that leveraged plays were behind the pressure on the Australian and New Zealand dollars in the third quarter of 1998. Between 9 and 16 October 1998, both currencies registered their largest one-week gains against the US dollar since 1985. These gains came on the heels of several weeks of near-record losses for the two currencies during the preceding two months.[70] The sharp appreciation of the Australian and New Zealand dollars also coincided exactly with a 12% appreciation of the yen against the US currency. This last event caught off-balance many speculative portfolios, including hedge funds, that had taken advantage of the combination of persistently low Japanese interest rates and a strong yen in the so-called yen carry trade. Indeed, the magnitude of the yen's move was partially attributed to panic buying of the currency to cover short positions.[71] The losses experienced by the Jaguar fund, flagship of the Tiger family of macro hedge funds, were estimated to exceed $2 billion during that same week. The timing of these events lends support to the view that the unwinding by leveraged investors of the yen carry trade forced these players to liquidate profitable investments and to re-evaluate the profitability of other speculative positions, including those against the Australian and New Zealand dollars.

69 For an examination of these practices and their impact on market integrity, see the "Report of the market dynamics study group" included in the Financial Stability Forum's report on HLIs.

70 The Australian dollar, in particular, marked its largest and 10th largest five-day fall against the US dollar for the past five years during the weeks of 24 August and 21 September 1998 respectively.

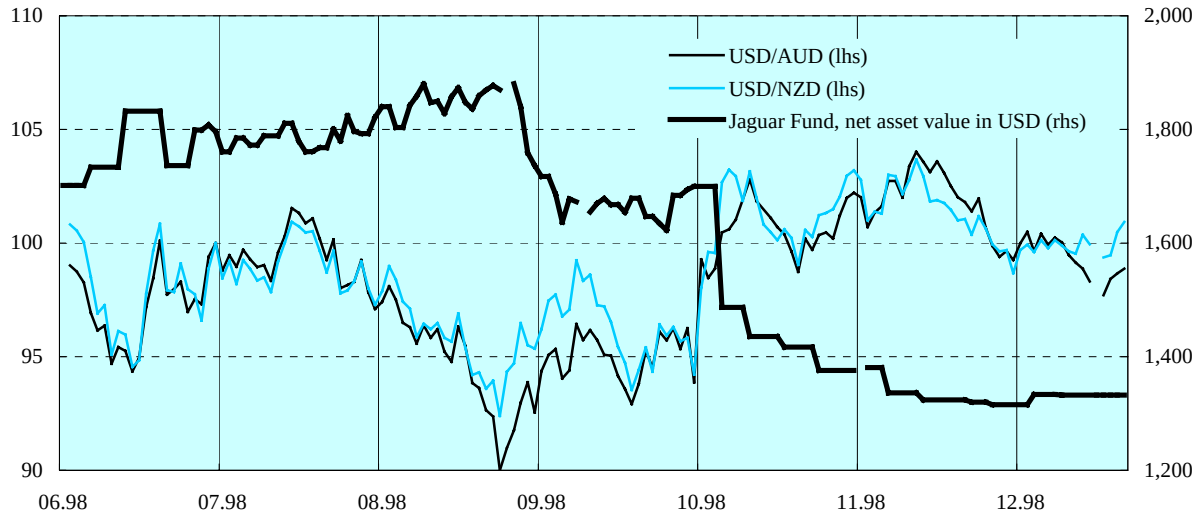
71 For a discussion of the yen carry trade and its role in the appreciation of the yen in October 1998, see BIS (1999).

The near collapse of LTCM

The disorderly market conditions that prevailed as investors sharply repriced risk in the wake of the Russian debt moratorium gave rise to highly atypical asset price dynamics and played havoc with investment strategies based on historical pricing relationships. Long-Term Capital Management (LTCM), a large hedge fund marketed as specialising in leveraged relative value arbitrage strategies, found its portfolio heavily exposed and its management was unable to contain the deterioration of its financial position.[72] Funded by credit at favourable terms supplied by many leading institutions, the fund had been able to build a portfolio that exceeded its assets under management by more than 25 times. Moreover, the fund was arguably the most active user of interest rate swaps in the world, with such contracts accounting for $750 billion of its total notional derivatives exposure of more than $1 trillion in August 1998. The uncertainty about the potential ramifications of a disorderly bankruptcy of LTCM both for its immediate counterparties and, given the already fragile state of financial markets at the time, for the financial system at large prompted the intervention by the Federal Reserve to facilitate a private sector solution. A consortium of 14 of the fund's creditors injected $3.6 billion of new capital into the fund in exchange for a 90% ownership stake and the assumption of control over the reduction in the fund's leverage and the unwinding of its portfolio.

Graph V.3

The effect of deleveraging on the Australian and New Zealand dollars



Sources: International Herald Tribune; Financial Times; national data.

The policy response

The repeated coincidence of financial turmoil and market disruption with hedge fund activity has raised the question of the appropriateness of the existing operating and regulatory framework for the sector. In the wake of the LTCM episode several groups, from both the official and private sectors, were established to consider the issues and propose action.[73] Given the sophistication of hedge fund

[72] See also *A Review of Financial Market Events in Autumn 1998* published in October 1999 by the Committee on the Global Financial System.

[73] The official sector groups were: the Basel Committee on Banking Supervision HLI Working Group, the IOSCO Task Force, the Financial Stability Forum HLI Working Group and the US President's Working Group. Private sector initiatives include the Counterparty Risk Management Policy Group, ISDA and a group of five large hedge fund managers.

investors and creditors, the focus of these groups was on intervention that would limit the potential economic costs from the funds' activity that are external to these parties. Particular attention was paid to how best to minimise the potential for market disruption without distorting market players' incentives or compromising the efficiency of the market mechanism.

The bulk of the proposals focus squarely on the main channel through which a fund's difficulties may be transmitted more widely: its effect on creditors. Sound risk management practices by hedge fund counterparties represent the most effective safeguard against the build-up of excessive leverage. Correct assessment and pricing of credit exposures needs to feed through into comprehensive measurement and management systems for both current and future risk exposures. These have to be complemented by due diligence procedures as well as pricing and collateralisation arrangements that accurately reflect the underlying risks. Both the private and the official sector bodies stress the importance of strengthening internal risk management structures.

Another common feature of the proposals is the emphasis on the importance of institutions regularly requesting from their highly leveraged counterparties all the information necessary to form a comprehensive view of their risk profile. Despite the fact that the shortcomings of current business practices are generally accepted, private sector initiative has fallen short of generating an adequate level of disclosure. Recognising this deficit, many reports also suggest that market discipline should be supported by the establishment of disclosure standards for a wide range of individual institutions. Developing such standards is a complex task that requires the careful balancing of the natural tension between meaningfulness, comparability and timeliness of the information disclosed against the legitimate desire of institutions to protect their commercial interests and competitive advantage.

In a further effort to enhance market transparency, it has been argued that quantitative and qualitative information on supervised institutions' exposures to hedge funds and other highly leveraged institutions should also be collected by regulators. This information would help the official sector to make a more accurate assessment of individual institutions' soundness as well as systemic fragility. To the same end, the official sector has been encouraged to strengthen the surveillance of financial market activity by refining and expanding the collection of information on OTC derivatives and foreign exchange markets.

Addressing concerns that certain trading practices adopted at times by market participants, including hedge funds, can compromise the integrity of financial market, the issue of a code of market conduct has been revisited. More specifically, the report by the Financial Stability Forum encouraged both leading market participants and competent national authorities to articulate new market codes and guidelines and revise existing ones as necessary. A draft model set of such guidelines has been produced by a working group of private sector participants and is expected to form the basis for future discussions.

Complementary to the above proposals, there have also been calls for more direct supervision of hedge funds themselves. The underlying rationale is that, to the extent that hedge fund activity may give rise to disruptions with systemic implications, these institutions should be subject to rules broadly similar to those that apply to other regulated financial entities. Such rules could take the form of more demanding reporting requirements or, at the extreme, a prudential regulatory framework including a licensing regime and explicit leverage and liquidity standards. Clearly, this would raise a number of practical and conceptual questions by requiring a legal definition of what constitutes a hedge fund and a prudential assessment of what constitutes the appropriate financial structure for its operations. It would also raise the risk that official oversight could substitute for market discipline. The official bodies decided against taking steps in this direction but reserved the right to revisit the issue should progress along the other lines not be adequate.

Hedge funds post-1998: dinosaurs or Darwinian survivors?

Arguably, the LTCM episode represented a landmark event in the evolution of the hedge fund industry. In its aftermath, an extensive re-examination of the role and the business framework of hedge funds by the industry itself, its counterparties and the policy community has resulted in a number of

significant changes. One could broadly describe the situation as one of "*cleansing*" to rid the financial system of the combination of high leverage and ill-controlled counterparty exposures related to hedge funds, and one of "*institutionalisation*" of investment in hedge funds as a legitimate alternative asset class for institutional portfolios.

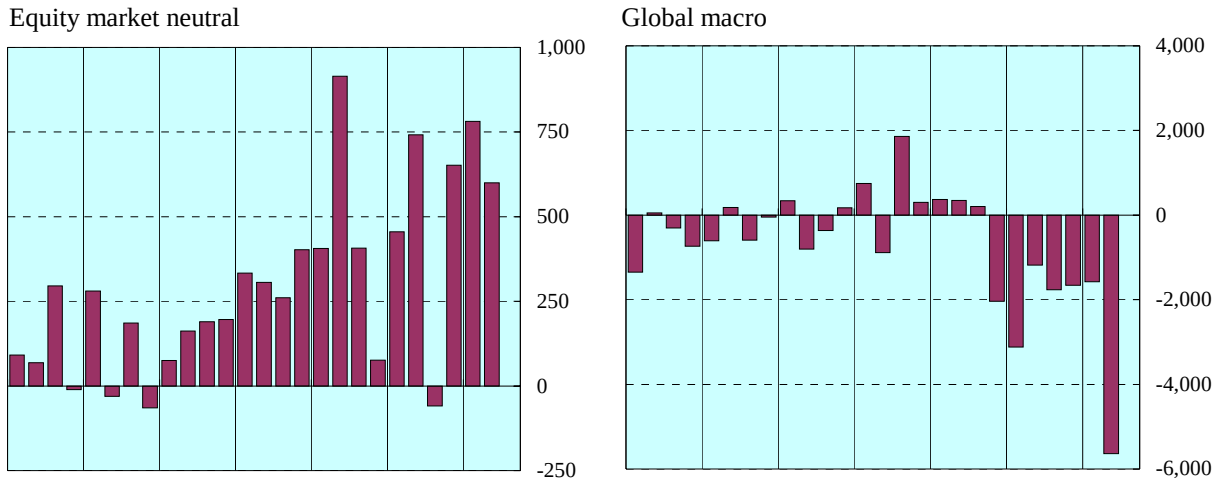
Over the past two years, three of the most celebrated fund names have withdrawn from the front stage of the investment world and the macro fund sector has experienced a haemorrhage of investors' funds. The management team of LTCM has overseen the repayment of the creditors' consortium, but has fallen short of the fundraising target for its new hedge fund as investors are reportedly less forthcoming than expected, despite the less aggressive investment profile of the new venture. In March this year, the Tiger family of funds was liquidated after being unable to either reverse its sagging performance or stop the outflow of investors' funds. One month later and on the heels of persistent disappointing returns, the management of the Quantum family of funds announced its plans for downsizing, including the closure of some funds and the adoption of a less opportunistic investment strategy.

The travails of Tiger and Quantum are indicative of the problems confronting macro hedge funds in general (Graph V.4). In fact, many commentators have argued that these problems are symptomatic of more general factors affecting the hedge fund industry overall as well as the profitability of the investment philosophy underlying the macro style. The immediate reaction of many hedge fund creditors to the LTCM episode was to sharply curtail their exposure and institute tighter control over

Graph V.4

Flows into macro and market neutral funds

In millions of US dollars



Source: TASS.

further extensions of credit. As leverage is a key element in hedge fund strategies, many funds had difficulties in returning to a pre-crisis scale of activity. In addition, some macro hedge fund managers have also lamented that a strong historical investment performance record has been of no help to them in understanding, let alone predicting, asset price movements over recent years that defy their analytical framework. Finally, commentators have also pointed to the multibillion size of the largest families of funds, arguing that growth had bred inertia and reduced stealth and nimbleness. It became increasingly difficult for the funds to quickly enter and exit markets and take advantage of opportunities without inviting a large number of followers.

Independently of the exact causes of the decline in their fortunes, the retrenchment of macro fund activity has been viewed by many as having reduced the number of investors more likely to take a contrarian view. The fact that liquidity in many markets, most notably foreign exchange, has failed to regain levels seen before autumn 1998 is cited as a consequence of the reduced diversity in the

composition of market participants. Arguably, dynamic investment strategies practised by hedge funds can strengthen market mechanisms for price discovery by contributing to market liquidity, especially in certain peripheral and OTC market segments. Clearly, however, these benefits are heavily conditional on the financial soundness of the funds themselves. Price discontinuities can result if hedge funds confronted with losses or liquidity problems suddenly curtail their active participation in these markets.

Headline news of the macro fund demise, however, should not mask a number of gradual but no less important developments that are likely to permanently affect the operating framework of the hedge fund industry as well as its function within the financial system. Hedge fund creditors and counterparties have been re-evaluating procedures for the assessment and pricing of risks and practices regarding their business relationships with the funds. While progress has been uneven and some areas require closer attention, a number of steps have been taken in the right direction.[74] The initial credit crunch has given way to more sophisticated management and control of exposures. In general, more detailed and timely information is now required, and increasingly greater attention is paid to the legal detail of master agreements regarding collateral, margining and default. Hedge funds themselves have also begun to adjust to the new environment, demonstrating a greater willingness to abide by more demanding disclosure standards and tighter credit exposure control procedures than in the past. Some funds have openly collaborated with private and official groupings in examining ways that could prevent LTCM-style episodes from happening in the future and minimise their impact if they did. Many have also supported mechanisms that promote transparency in practical ways, such as the establishment of an open exchange for shares in hedge funds that agree to predetermined disclosure standards.

On the other hand, there appears to be a greater acceptance of the idea that hedge funds represent legitimate investments that can complement well diversified institutional and high net worth individual portfolios. A number of pension funds and other mainstream institutional investors have publicly advertised their increased interest in so-called alternative investment vehicles, which include hedge funds. The example of the California Public Employees retirement fund is probably the best known, but by no means the only case. The impressive gains of equity markets over the recent period have augmented the ranks of wealthy private investors but have also created anxiety with the high valuation of the markets and uncertainty regarding the correct paradigm for the interpretation of those valuations. Market neutral investment styles practised by many hedge funds have attracted the attention of investors seeking to protect their gains against equity market swings. Tapping into the high net worth market has been a driving force behind the accelerated growth of the hedge fund industry in new regional markets such as East Asia and especially Europe. Market observer reports bring the number of new European funds to 75 for the first half of this year, five more than the equivalent figure for the whole of 1999.[75] Many of these funds have been created by banks and asset managers as part of a more general business growth strategy based on a strong private banking arm.

In summary, the two years since the LTCM episode have been a period of reassessment of the role of hedge funds in the financial system. Drawing on its own experience and the proposals of official bodies, the private sector has begun to address the practices that left many institutions vulnerable to the failure of HLIs. Similarly, the hedge fund industry itself appears to be in the process of moving gradually away from the image of aggressive and secretive speculators, and towards one of controlled, sophisticated investment vehicles that offer opportunities for a well planned diversification and yield enhancement to "real money" investors. While these trends enhance the resilience and efficiency of financial markets, it is important that current gains are consolidated and further improvements are made along the same lines. This would be the only way to ensure that appropriate structures are in place to deal with market turmoil long after the memories of autumn 1998 have faded.

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[74] The review by the Basel Committee on Banking Supervision of the implementation of its report on sound practices in banks' interaction with HLIs provides a detailed assessment of the response to the report's recommendations.

[75] See Farrow (2000).

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VI. Structural and regulatory developments

Initiatives and reports concerning financial institutions

July

The Basel Committee on Banking Supervision (BCBS) released a consultative paper highlighting the importance of the work of internal auditors in banking organisations and the need for cooperation between banking supervisors and banks' internal and external auditors.[76] The paper, prepared by the Basel Committee's Task Force on Accounting Issues, calls for independent internal audit functions with professional competence in banks. It notes that every activity and every entity of a bank should fall within the scope of internal audit. The Basel Committee said that it was seeking comments on: (i) the definition of internal audit; (ii) the "whistle-blowing" function of internal auditors; (iii) the degree to which the internal audit function might be outsourced; and (iv) internal audit by an institution's external auditor.

September

The BCBS issued a revised version of its supervisory guidance on the management of settlement risk arising from foreign exchange transactions.[77] The guidance stresses that foreign exchange settlement risk is a form of credit risk that banks should manage, like other credit risks of a similar size and duration, through a formal process of measurement and control with active senior management oversight. It also suggests that supervisors focus on whether a bank has evaluated potential FX settlement risk reductions from netting and other private sector initiatives. The revised guidance was drawn up in close consultation with the Committee on Payment and Settlement Systems (CPSS) and builds on the work of that Committee, in particular its reports *Settlement Risk in Foreign Exchange Transactions* (March 1996) and *Reducing Foreign Exchange Settlement Risk: A Progress Report* (July 1998).

The BCBS issued two papers on the issue of credit risk. The first, *Principles for the Management of Credit Risk*, is a revised version of its guidance on credit risk management and disclosure. The paper specifically addresses the following areas: (i) establishing an appropriate credit risk environment; (ii) operating under a sound credit-granting process; (iii) maintaining an appropriate credit administration, measurement and monitoring process; and (iv) ensuring adequate controls over credit risk. The second paper, *Best Practices for Credit Risk Disclosure*, aims to promote adequate and effective transparency of banks' credit risk profiles by providing guidance to banks on useful credit risk disclosures and discussing the information needs of supervisors with respect to credit risk. The guidance covers credit risk in all types of banking activities, including lending, trading, investments, liquidity/funding and asset management. Both papers are intended to be applicable in a wide range of jurisdictions and for banking institutions of varying degrees of sophistication.

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[76] See *Internal Audit in Banking Organisations and the Relationship of the Supervisory Authorities with Internal and External Auditors*, Basel Committee on Banking Supervision, Basel, July 2000 (available on www.bis.org).

[77] See *Supervisory Guidance for Managing Settlement Risk in Foreign Exchange Transactions*, Basel Committee on Banking Supervision, Basel, September 2000 (available on www.bis.org).

On 20 and 21 September 2000, representatives of about 160 banking supervisory authorities from more than 125 countries met in Basel for the 11th International Conference of Banking Supervisors (ICBS) at the invitation of the Swiss National Bank, the Swiss Federal Banking Commission and the BIS.[78] The two main themes of the conference were the Review of the Capital Accord, and The Financial Industry in the 21st Century and the Consequences for Bank Supervision. William McDonough, the Chairman of the BCBS, said that the new Accord would be structured on the "three pillars" of minimum capital requirements, effective bank supervision and market discipline. He highlighted that the centrepiece of the new Accord would probably be the internal ratings-based approach to credit risk, which would be applicable to those institutions that have in place strong internal rating systems and controls. He mentioned that the Committee would also revise the standardised approach given that banks and supervisors in some countries did not yet have the necessary resources to implement an internal ratings approach. He said that, while the risk sensitivity of the standardised approach would be improved, the need to maintain simplicity would favour the use of external credit risk assessments. He acknowledged that such a proposal had raised concerns, such as the limited availability of credit ratings in emerging market countries and the performance record of some rating agencies in the context of recent financial crises, but he noted that few alternatives were suggested during the previous comment period. Attempts would be made to address these concerns, perhaps through the use of other indicators of a borrower's credit quality and additional risk weights.[79] The Committee will also be working on other key aspects of the new framework, including assessing a capital charge for operational risk. Mr McDonough said that he expected the Committee to publish a revised version of the Accord in January 2001 and a final one in autumn 2001.

Initiatives and reports concerning financial markets

August

The Financial Stability Forum (FSF) held its fourth meeting at the BIS in Basel on 7-8 September 2000.[80] In addition to its regular exchange of views on developments affecting financial stability and on ongoing work by Forum members, the meeting considered a report on possible incentives to foster implementation of international standards to strengthen the financial system, the progress being made in setting out international guidance on deposit insurance schemes, and the implications of e-finance for supervision, regulation and market functioning. The FSF also reviewed progress in implementing the recommendations of the reports on highly leveraged institutions, capital flows, and offshore financial centres that were endorsed by the Forum at its March meeting in Singapore. It welcomed the considerable progress made in a wide range of areas and emphasised the importance of keeping up the momentum in ongoing implementation efforts, including concrete actions by national authorities and the private sector.

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[78] These international conferences, held at two-year intervals since 1979, are designed to promote cooperation among national authorities in the supervision of international banking and to enable senior representatives of supervisory authorities from a large number of countries to exchange views on a range of current issues of common concern.

[79] Other suggested measures include ratings provided by export credit agencies and the use by less sophisticated banks of rating systems developed by more sophisticated banks.

[80] The FSF was created in February 1999 by G7 finance ministers and central bank governors to promote international financial stability through enhanced information exchange and cooperation in supervision and surveillance. It brings together on a regular basis national authorities responsible for financial stability in significant international financial centres, international financial institutions, sector-specific international groupings of regulators and supervisors, and committees of central bank experts. The FSF is chaired by Andrew Crockett, General Manager of the Bank for International Settlements, in a personal capacity.

September

The Executive Board of the International Monetary Fund discussed an array of possible changes to the Fund's financing facilities. It acknowledged that the Contingent Credit Line (CCL), a new facility which was approved by the Board in April 1999, but which had not yet been used by members, had not achieved its objectives, and that a number of changes were needed to allow it to play an effective role. While the eligibility criteria for the CCL remained appropriate, the Board agreed on a major overhaul of other features of the facility in order to make it a more effective instrument for preventing crises and resisting contagion in countries pursuing sound policies (including a reduction in the rate charged on CCL resources and in commitment fees). The Board also examined whether standby arrangements and the Extended Fund Facility were being used efficiently, particularly against the background of the increasing growth and integration of global capital markets. It considered amendments to these facilities aimed at encouraging countries to avoid reliance on IMF resources for unduly long periods and in unduly large amounts (including expectations of early repurchase of Fund resources and surcharges at high levels of credit outstanding). Finally, the Board examined ways of enhancing post-programme monitoring, especially when credit outstanding exceeded a certain threshold level.

The US Securities and Exchange Commission (SEC) and the US Commodity Futures Trading Commission (CFTC) agreed on an amendment to the legislation ruling futures markets. The pact reached by the agencies calls for an end to the 18-year-old ban on the trading of futures on individual stocks and for joint regulatory oversight of single stock futures and narrow stock index futures (which are both defined as security futures in the agreement). Broad-based indices will remain subject to the CFTC's exclusive jurisdiction. Single stock futures and narrow stock index contracts could be traded on both stock and futures exchanges and by both stock and futures brokers. Futures exchange had argued in favour of allowing such contracts as a means of gaining new business, while securities exchanges had expressed concerns about investor protection and unfair competition with stock options. In order to address these concerns, the new rules state that single stock and narrow index futures will fall under the customer protection provisions of US securities laws and that margin levels will not be lower than those on comparable stock options. The new measure is not intended to address the comparative tax treatment of security futures and equity options.

Initiatives and reports concerning market infrastructure

July

An international Task Force established by the CPSS released a consultative report setting out core principles for systemically important payment systems and guidance on the interpretation of those principles.[81] The principles, which are expressed in general terms, suggest key characteristics that all systemically important payment systems should satisfy. The Task Force sought comments on, inter alia, the clarity of the explanations given, the range of issues covered, particular difficulties expected to be encountered in implementing the principles, and plans for compliance with them.

The European Commission's Council of Economic and Finance Ministers appointed a seven-member group of "wise men" to review regulation and disclosure in European securities markets in the light of globalisation. The Committee on the Regulation of European Securities Markets will discuss how to implement the Financial Services Action Plan endorsed by EU leaders at their March 2000 summit in Lisbon, and designed to remove the most important barriers to a single financial market in Europe by 2005. It will: (i) report on the current status of regulation in EU securities markets; (ii) assess how regulation can best respond to developments such as cross-border stock market alliances and technical

[81] The Task Force was made up of payment system experts from 23 central banks as well as the International Monetary Fund and the World Bank. See *Core Principles for Systemically Important Payment Systems*, Committee on Payment and Settlement Systems, Basel, July 2000 (available on www.bis.org).

innovation; and (iii) propose scenarios to ensure greater convergence and cooperation in the day-to-day implementation of regulation. In August, the Committee sent an online questionnaire requesting suggestions on what type of regulatory arrangements would best support an integrated European securities market.

The Swiss Exchange and Tradepoint Financial Services, the electronic stock exchange, joined forces to create virt-x, a pan-European electronic exchange for blue-chip stocks. The new exchange, which will use the Swiss Exchange's EBS trading platform, will offer a single rule book, an anonymous electronic order book, and fully integrated clearing and settlement through the London Clearing House, Euroclear, SIS SegaInterSettle and Crest. The United Kingdom's Financial Services Authority will be the sole regulator. The exchange should begin its operation in the first quarter of 2001, when it will become the sole trading platform for Swiss blue-chip stocks.

Clearstream International, the clearing entity created by the merger of Cedel SA and Deutsche Börse Clearing AG, announced the launch of Creation, a new settlement platform integrating end-to-end processing through the three main functional business areas of clearing and settlement, custody and connectivity, and reporting. In addition to these core services, the platform will incorporate other aspects, including securities lending, collateral management, tripartite repo, management information systems, and billing within a unified technical architecture. Creation will replace the old Cedel legacy systems with the latest computer software and hardware. The development of the facility forms part of Clearstream International's strategy to create an integrated global securities market.

August

Clearstream International and CrestCo published details of a low-cost settlement arrangement for the cross-border clearing of securities.[82] The solution would enable customers to settle transactions in German and UK securities (and in the relevant currencies) through the existing interfaces of Crest or Clearstream. From a customer's perspective, such an initiative would offer a single integrated trading and settlement process, minimise changes to systems and reduce the overall cost of cross-border settlement (to the same level as that of domestic trades). The settlement model would support trades with or without a central counterparty. The two groups said that the plan would be implemented independently of developments involving the London Stock Exchange.

September

A working group of the Committee on the Global Financial System (CGFS) released a new report on the BIS international banking statistics.[83] This followed earlier work carried out by the CGFS in the wake of the Asian financial crisis, and was inspired by the perception that greater emphasis needed to be placed on the value of good financial statistics to support informed decision-making by the private sector. In the course of its deliberations, the group concluded that the consolidated banking statistics should aim to be a key source of information on the country risk exposures of internationally active banks. It was thus decided that, where feasible, consolidated banking data should cover all relevant aspects of financial institutions' exposures – including guarantees by third parties, undrawn contingent credit facilities and off-balance sheet financial contracting. In addition, the focus of the BIS statistics was to be changed so as to adopt detailed reporting of data collected on an ultimate risk basis, with a view to developing a statistical system consistent with commercial banks' own risk management practices. At the same time, the working group appreciated the importance of information on the basis of residence of the immediate borrower. Such information was crucial, for example, to enable cross-checks on country compilations of external debt statistics. The working group decided to call for a modification of the existing BIS international banking statistics and recommended the following

[82] CrestCo offers real-time settlement of UK, Irish and international securities.

[83] See *Report of the Working Group on the BIS International Banking Statistics*, Committee on the Global Financial System, Basel, September 2000 (available on www.bis.org).

actions: (i) the BIS consolidated banking statistics should be restructured to present data on an ultimate risk basis; (ii) the target date for the new data series should be set at the end of 2004; and (iii) the BIS should revise its presentation of the commitment data to emphasise their interpretation as a measure of a contingent source of borrower funding and hence credit risk.

Euroclear, the international clearing house, announced a memorandum of understanding that will lead to the takeover of the clearance and settlement systems of the Belgian and Dutch stock exchanges. The move followed the earlier announcement that Euroclear would merge with Sicovam, the French central securities depository.[84] The consolidation of Belgian, Dutch and French clearing houses under Euroclear to create a centralised settlement facility will take place in parallel with the merger of stock exchanges from the three countries under the name of Euronext.

The proposed merger between the Deutsche Börse (DB) and the London Stock Exchange (LSE) to form iX failed to materialise. The project had faced a number of difficulties, including shareholders' concerns over corporate valuation and control of the new entity, worries that the initiative would do little to reduce clearing and settlement costs (since the exchanges had announced that they would retain their existing arrangements), fears that the separation of regulatory regimes between Frankfurt and London could not be made to work, and a perception that liquidity in mid-size companies would suffer from a split in the trading of blue-chip and growth stocks between London and Frankfurt respectively. The breakdown in the planned merger was prompted by the launch of a hostile takeover bid by OM of Sweden. Although the LSE rejected OM's offer, several other exchanges have been known to be interested in merging with the LSE. However, the success of any further merger proposals will continue to depend on a successful resolution of many of the issues raised by the initial merger proposal between the DB and the LSE. Difficulties in ironing out differences between existing exchanges might provide the opportunity for successful market entry by new electronic marketplaces operating under a single rule book and regulator.

[84] The definitive merger agreement between the two entities was signed in September. From early next year, Sicovam will become Euroclear France, a wholly owned subsidiary of Euroclear Bank.

Chronology of major structural and regulatory developments

Month	Body	Initiative
July 2000	Basel Committee on Banking Supervision	• Releases *Internal Audit in Banking Organisations and the Relationship of the Supervisory Authorities with Internal and External Auditors*
	Committee on Payment and Settlement Systems	• Releases *Core Principles for Systemically Important Payment Systems*
	European Commission's Council of Economic and Finance Ministers	• Appoints the Committee on the Regulation of Securities Markets
	Swiss Exchange and Tradepoint	• Announce the creation of virt-x, a pan-European exchange for blue-chip stocks
	Clearstream International and Deutsche Börse Clearing	• Announce the launch of Creation, a new joint settlement platform
August 2000	Financial Stability Forum	• Fourth meeting held at the BIS
	Clearstream and CrestCo	• Publish details of a low-cost settlement arrangement for the cross-border clearing of securities
September 2000	Basel Committee on Banking Supervision	• Releases *Supervisory Guidance for Managing Settlement Risk in Foreign Exchange Transactions*
	Basel Committee on Banking Supervision	• Releases *Principles for the Management of Credit Risk* and *Best Practices for Credit Risk Disclosure*
	Basel Committee on Banking Supervision, Swiss National Bank and Swiss Federal Banking Commission	• Hold the 11th International Conference of Banking Supervisors
	Committee on the Global Financial System	• Releases *Report of the Working Group on the BIS International Banking Statistics*
	International Monetary Fund	• Agrees on an overhaul of the IMF's financing facilities
	US Securities and Exchange Commission and US Commodity Futures Trading Commission	• Agree on an amendment to the regulation of US futures markets
	Euroclear and Belgian and Dutch stock exchanges	• Euroclear takes over the clearance and settlement systems of the Belgian and Dutch stock exchanges
	Deutsche Börse and London Stock Exchange	• Collapse of planned merger