V. Turmoil in asset markets

Highlights

To an observer armed only with annual observation points the period under review would present itself simply as the continuation of previous years' trends. Compared to the beginning of 1998, buoyant equity markets in most of the industrial world reached new heights, government bond yields declined further and real estate prices consolidated their rebound. There would be little in this picture to betray the fact that the defining events of this period occurred in the two months that followed the announcement of the Russian debt moratorium in mid-August 1998. During this brief spell, financial markets around the globe experienced extraordinary strains, raising apprehensions among market participants and policymakers of an imminent implosion of the financial system. As investors appeared to shy away from practically all types of risk, liquidity dried up in financial markets in both industrial and emerging economies, and many borrowers were unable to raise financing even at punitive rates. Prices for all asset classes except the major industrial country government bonds declined and issuance of new securities ground to a halt. Equally remarkable, however, has been the recovery of equity prices in most countries since November 1998 and the relative calm that has returned to fixed income markets. The first part of this chapter discusses asset price developments in the industrial world and offers some thoughts on the issues related to the current valuation of equity markets.

The events of last year, however extraordinary in scope, could arguably be viewed as a natural by-product of the modern financial landscape as it has been reshaped by the combined influence of innovation and liberalisation. Larger and more complex financial markets are more efficient in allocating capital and risk but are also potentially more exposed to turbulence as strains can spread across more closely integrated market segments faster than ever before. Drawing on this most recent experience of market turmoil, the second part of this chapter considers some salient features of financial market behaviour in periods of stress.

Asset market developments in the industrial world

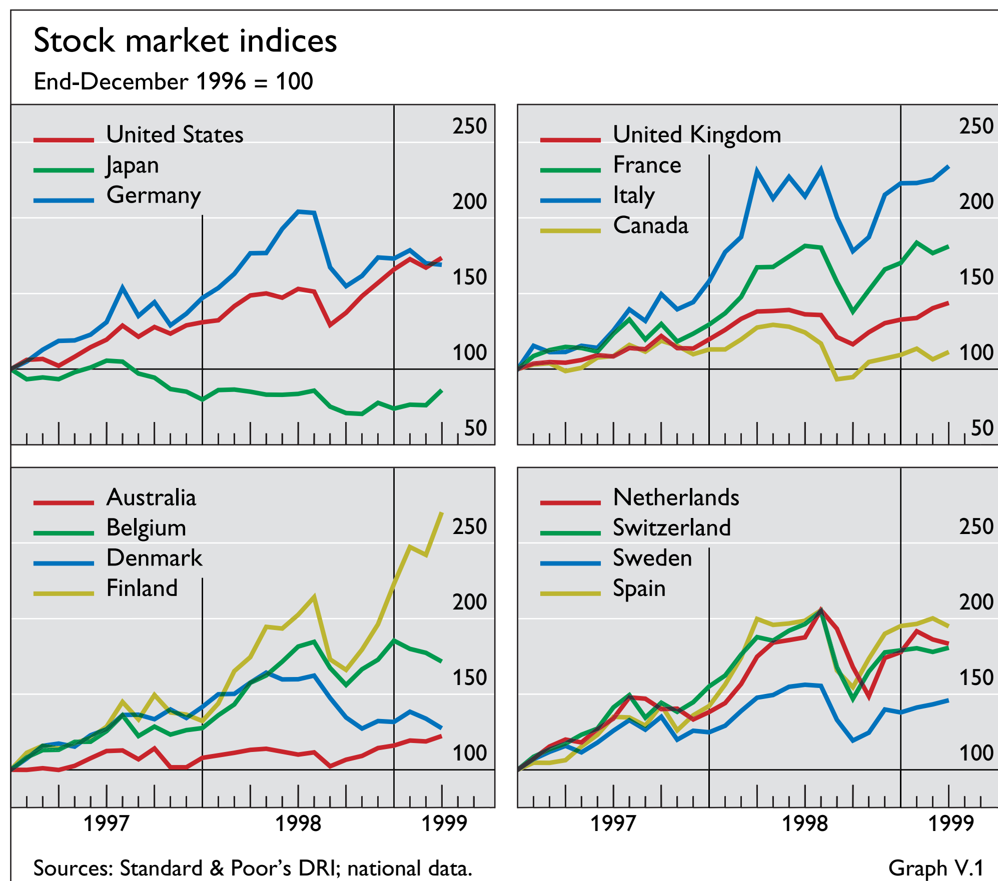
Mature financial markets, outside Japan, had demonstrated considerable resilience to the turmoil that engulfed South-East Asia in 1997. By early 1998 it appeared as if there was little else besides historical valuation relationships that could threaten the upward trend in financial asset prices. The effect of sagging demand from Asia was viewed as a beneficial check on price pressures for North America, against a buoyant outlook for domestic demand. Financial

markets in Europe were already anticipating the potential benefits from the introduction of the single currency as the uncertainty about the initial composition of the euro zone was being resolved. As equity prices regained the lost ground and surpassed previous peaks, the only trace of the October 1997 correction was an aftertaste of uncertainty as volatility remained relatively high. This complacency was abruptly challenged by Russia's announcement of a moratorium on part of its national debt obligations. The announcement acted as a catalyst in prompting a general re-evaluation of market participants' outlook and triggered a chain reaction that quickly affected virtually all market segments, in many instances impairing their ability to function. The gradual easing of these strains after October 1998 was facilitated by the loosening of monetary conditions in most major economies, but not before apprehensions were raised regarding the profitability, and at times the survival, of major financial intermediaries.

Equity markets

Sharp price declines in autumn ...

With the notable exception of Japan, equity prices continued their trend to record highs up to mid-1998. In most major markets this trend was interrupted in mid-July amid concerns about the effect of the Asian financial crisis on corporate profits. Market participants' reappraisal of risk following the Russian debt moratorium put additional downward pressure on prices. Consequently, stock markets suffered their largest setbacks since 1987, with major market indices declining by 20–40% between mid-July and the first week



of October. The fall in prices was especially severe in continental Europe, perhaps owing to the region's close economic ties with Russia and the simultaneous perception of a weakening of economic activity. Equity markets in all major economies recovered during the fourth quarter of 1998, and in many cases prices climbed back to their early summer highs. While the easing of the monetary policy stance in the United States and Europe contributed to the recovery, if only as a signal of central banks' readiness to confront the dangers posed by financial market turbulence, the pace of recovery surprised many observers. The rebound was particularly strong in the United States, where equity prices closed the year at record highs. In Japan, by contrast, the ongoing recession continued to depress stock prices for most of the period under review. A rise in the price of bank shares, due to increased investor confidence about the planned restructuring of the banking sector, supported a limited rally in Japanese equities in the first quarter of 1999.

… were later reversed

Current levels of equity prices may be a cause for concern, at least when judged by historical valuation criteria. Dividend yields have been trending lower in most G10 economies since the early 1980s, as equity prices have been growing faster than dividend payouts. At present, with the exception of Japan, Italy and Sweden, current dividend yields stand near their troughs, and have actually touched historical lows in the United Kingdom and the United States (Table V.1). On the assumption that dividends will continue to increase at about their past average growth rates, the generally low levels of dividend yields would imply that many stock markets are currently overvalued. In the case of the United States, the bull market that began in the early 1980s bears some resemblance to that of the 1950s and 1960s, which was also characterised by declining dividend yields. That previous protracted stock market rally ended with the sharp fall of equity prices following the first major oil price shock in 1973.

Current valuations difficult to explain by historical norms …

Indicators of valuation of share prices[1]

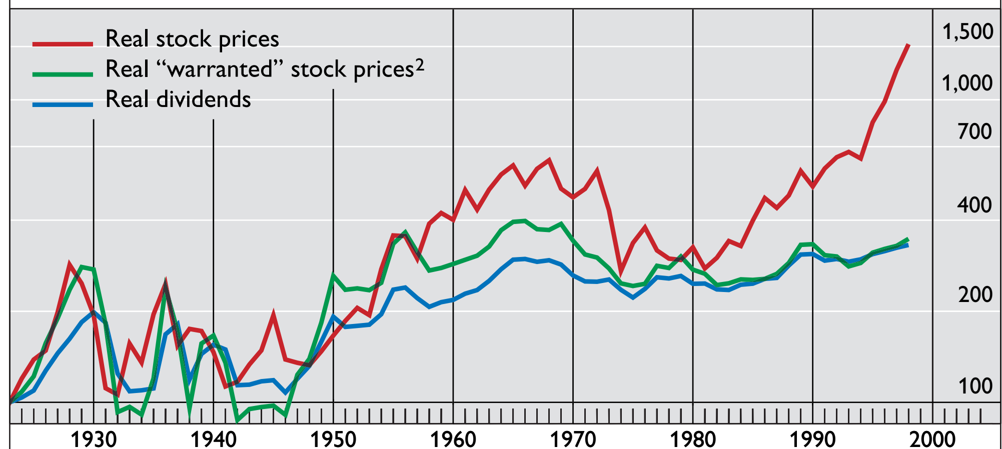
	Dividend yields				Price/earnings ratios[2]			
	Trough		Average	March 1999[3]	Peak		Average	March 1999[3]
	level	date			level	date		
United States	1.3	1999	2.7	1.3	34	1998	11	34
Japan	0.4	1987	0.9	0.8	77	1987	27	60
Germany	1.2	1998	1.9	1.4	26	1998	9	19
France	2.0	1998	2.9	2.2	30	1973	9	22
Italy	1.0	1981	2.1	2.0	34	1998	13	26
United Kingdom	2.6	1999	3.4	2.6	26	1994	9	24
Canada	1.4	1998	2.4	1.6	37	1998	9	26
Netherlands	1.7	1998	3.4	2.2	27	1998	8	27
Belgium	1.4	1998	3.0	1.6	29	1973	9	21
Switzerland	1.0	1998	1.7	1.4	28	1998	9	24
Sweden	1.1	1994	1.7	1.8	30	1994	12	21

[1] Since 1973; based on daily data. [2] For Italy, since June 1986; for the United Kingdom, since 1980; for Canada, excluding 1991–94, when the ratio was exceptionally high owing to very low earnings due to write-offs (peak in 1994: 504). [3] Month-end.

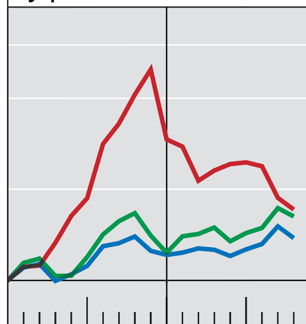
Source: Datastream. Table V.1

Actual and "warranted" stock prices and dividends
Indices, deflated by consumer prices, at year-end (semi-logarithmic scale)[1]

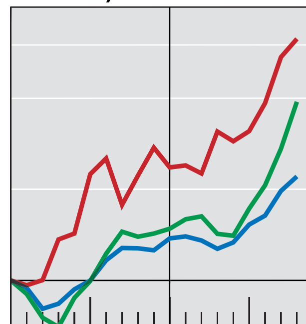
United States



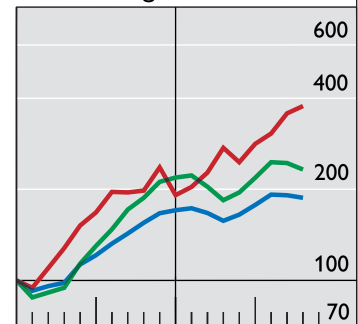
Japan



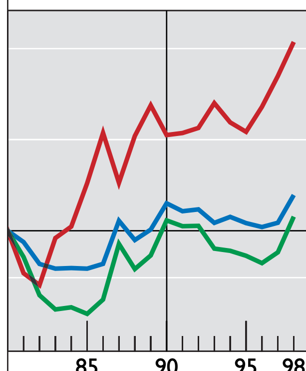
Germany



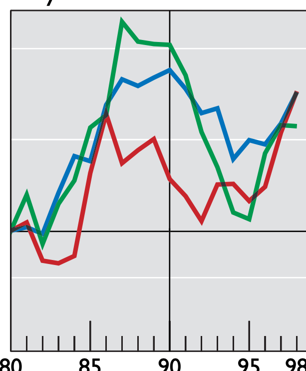
United Kingdom



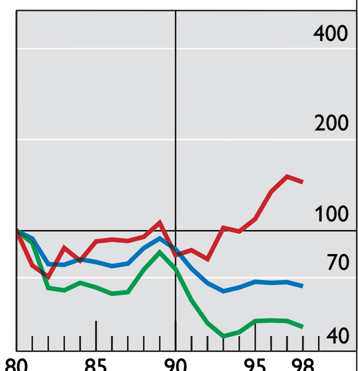
France



Italy



Canada



[1] For the United States, 1923 = 100; for the other countries, 1980 = 100. [2] Computed assuming that investors extrapolate an average of past dividend growth into the future (see Barsky and De Long, "Why does the stock market fluctuate?", in *The Quarterly Journal of Economics*, May 1993).

Sources: Standard & Poor's Statistical Service; Datastream; national data; BIS calculations. Graph V.2

A sustained decline in dividend yields would be consistent with expectations of a permanent increase in the future rate of growth of real dividends. If investors extrapolate recent dividend growth rates, the strong growth of dividends in the United Kingdom since the mid-1980s and in Germany since the mid-1990s may indeed be a reason for even stronger equity price growth in these countries. However, a significant part of current valuations remains unexplained since "warranted" share price growth based

on this assumption falls short of observed rates of equity price increases (Graph V.2). Furthermore, this hypothesis cannot account for the global strength of equity markets as recent dividend growth has been relatively modest in countries such as the United States and France, and falling in Canada. Another reason for expecting an imminent rise in dividend payments would be the strong growth of corporate earnings over a sustained period. However, Germany is the only country where earnings growth has outpaced that of dividends since 1980. Real earnings per share have grown at about the same rate as real dividends per share in the United States and France, and have lagged dividend growth in the other G10 economies (Table V.2). Finally, a recent rise in the number of share buybacks, often a surrogate for dividend payouts, could also be a reason why below average dividend yields need not signal stock market overvaluation. However, share buybacks, which have been particularly strong in France, Germany, the United Kingdom and the United States, do not necessarily affect current levels of price/earnings multiples that are well above historical averages in all markets (Table V.1).

… or recent trends …

A plausible explanation for the combination of low dividend yields and high price/earnings multiples in many markets might be found in investors' anticipation of above average growth in corporate earnings. Indeed, it might be argued that the rapid adoption of new technology has enhanced business efficiency. Assuming that investors expect a permanent shift in business profitability, the last column of Table V.2 calculates the levels of future earnings growth that are implicit in price/earnings multiples and long-term interest rates in the G7 countries in March 1999. These implied rates of earnings growth are generally similar to those recorded from the previous trough, but are several times greater than their historical averages. Whether such expectations are reasonable depends in part on the longer-term sustainability of the accelerated pace of productivity growth.

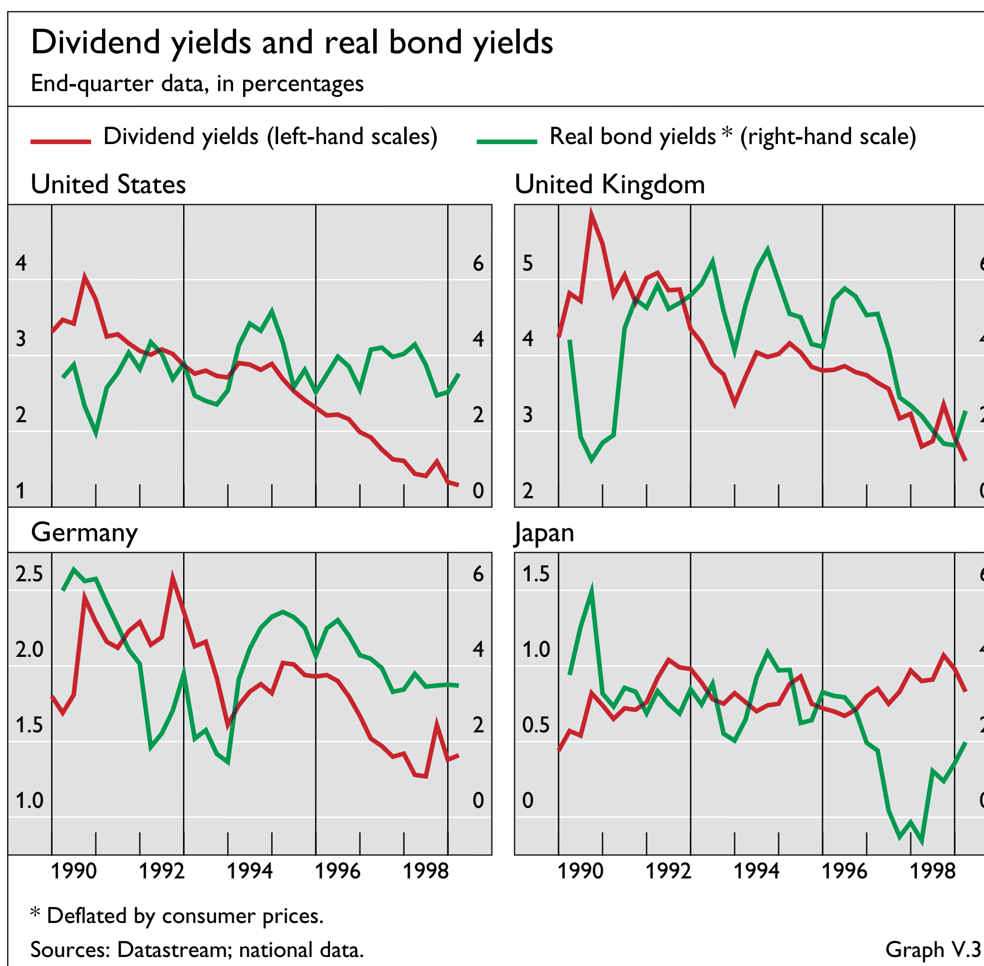
… as they imply accelerating profit growth …

Real dividends and earnings per share[1]

	Real dividends	Real earnings per share		*Implicit future growth of earnings[3]*
	Annualised average growth rate			
	1980–98		from previous trough[2]	
United States	1.6	1.6	8.6	*8.3*
Japan	0.0	–2.1	–	*7.0*
Germany	4.5	5.2	8.8	*8.3*
France	2.7	2.7	7.1	*7.9*
Italy	6.0	–0.2	7.6	*7.5*
United Kingdom	3.3	1.4	5.3	*6.6*
Canada	–2.3	–5.6[4]	2.7[4]	*9.3*

[1] Deflated by the CPI. [2] Not applicable for Japan, as the trough was in 1998. [3] Expected permanent annual rate of growth in earnings implicit in the March 1999 price/earnings ratio and the real long-term interest rate, assuming an equity risk premium of 5%. [4] Excluding 1991–94, when earnings were exceptionally low due to write-offs.

Sources: Datastream; national data; BIS calculations. Table V.2

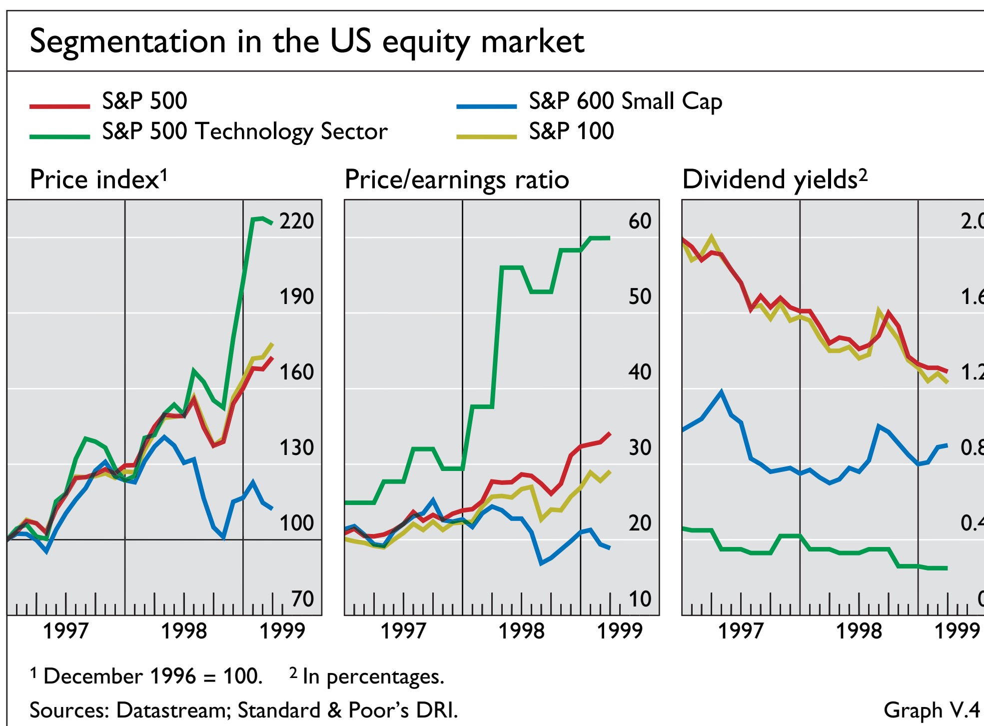


… or permanently lower required returns

The above calculation may overstate the expected earnings growth rate to the extent that investors anticipate a further decline in long-term interest rates. Indeed, the decline in real interest rates in many countries over the past four years has played a significant role in sustaining lower dividend yields (Graph V.3). However, this does not seem to be the case in the United States, where dividend yields have been halved in the same period while real bond yields have hovered around 3.5%, raising the possibility of a decline in the premium required by investors to compensate for the greater risk of holding equities. Such a decline might reflect the view that the probability and severity of future recessions have been reduced because of the better management of fiscal and monetary policies.

Segmentation in the US market

Current aggregate equity market valuations in the United States mask a substantial degree of divergence between different sectors of the market. Shares of firms in the broad area of computing and communications technology have spectacularly outperformed the aggregate price index (Graph V.4). The notable success of many firms in this sector in raising public equity has spurred a flurry of activity in the primary market, with prices often soaring immediately after the introduction of a stock. This could be interpreted as symptomatic of a shift in attitudes towards the composition of external finance, with public equity assuming the role previously played by the private equity market in the financing of highly risky but potentially very profitable ventures.



[1] December 1996 = 100. [2] In percentages.
Sources: Datastream; Standard & Poor's DRI. Graph V.4

Thus, while valuations based on current earnings levels for the technology sector may seem abnormally high compared to historical ratios, they accord better with expectations of enhanced future profitability similar to that typically enjoyed by companies in more mature sectors.

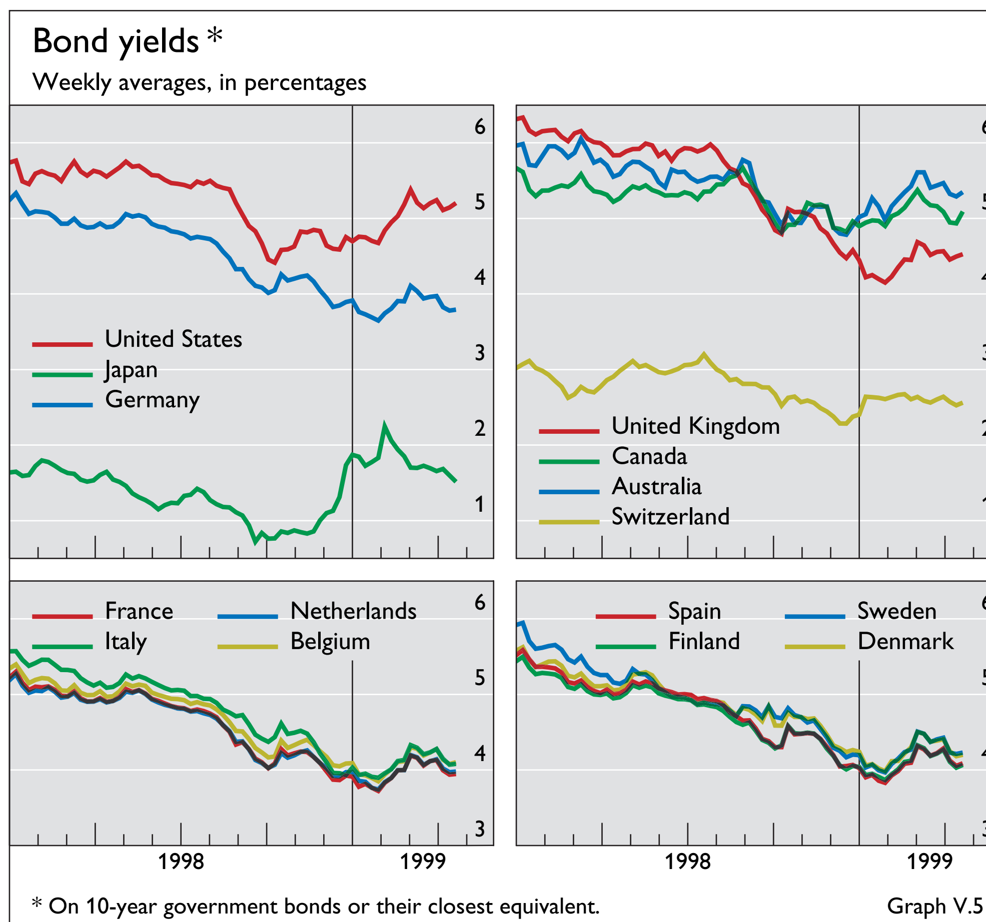
Bond markets

The trend decline in bond yields ...

In the first half of 1998, long-term interest rates in the industrial countries continued to decline and, in most cases, dropped below the 5% mark. A favourable inflation environment, accommodative monetary policies and confidence in the prospects for EMU contributed to this trend (Graph V.5). There were few harbingers of the financial turbulence to come. Historical and implied bond yield volatility indicators were actually at or near a trough in July in all countries except Japan. A year after the onset of the Asian crisis, low credit spreads on US and European debt, especially for lower-quality corporate instruments, were suggestive of a certain market complacency towards risk, also evidenced by the continued flow of private sector funds into emerging markets outside Asia (see Chapter III).

... accelerated in August ...

The sudden reversal in market sentiment sparked by the Russian moratorium disrupted the convergence trend in long-term interest rates that had characterised mature financial markets since the end of 1994. Investors' attempts to ride out the turmoil by shifting into traditional havens accentuated the downward trend in long-term rates for government bonds, but there were some differences across countries. Bond yield differentials edged up vis-à-vis the United States and Germany as interest rates declined further in those two countries, but the widening of spreads was relatively less pronounced within the future euro area (Graph V.6).



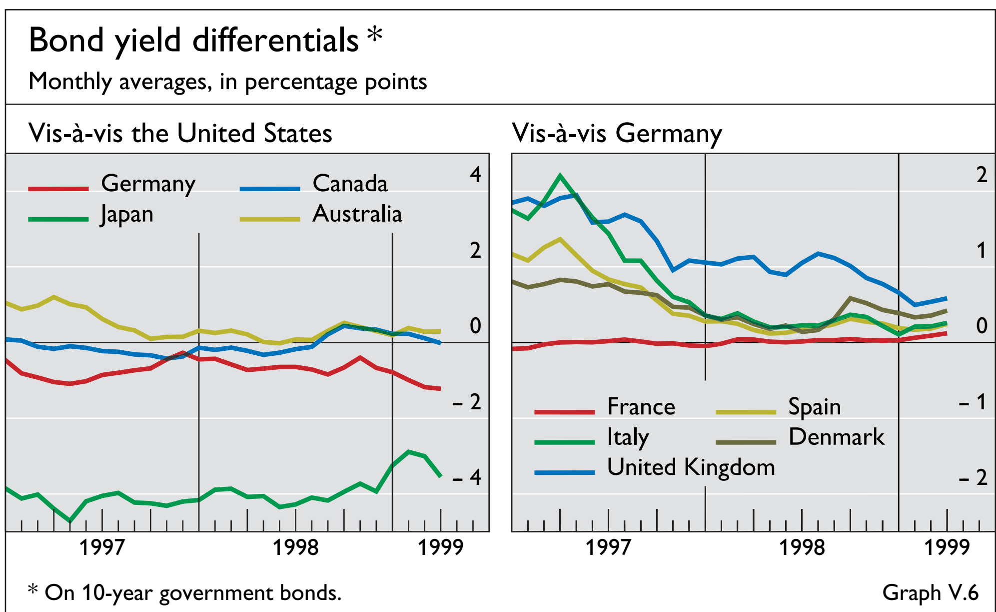
* On 10-year government bonds or their closest equivalent.

… but was interrupted in October

The generalised flight to quality culminated in the last week of September and early October. The rise in bond yield volatility, both historical and implied, was validated in October by a shift in international bond yields, which ratcheted back up in most countries (Graph V.7). These developments reflected in part investors' decisions to reduce their exposures worldwide, as exemplified by the large-scale unwinding of the yen carry trades which contributed to the abrupt appreciation of the yen in early October (see Chapter VI). Market conditions were further disturbed as highly leveraged investors unwound their cash exposures and off-balance sheet position-taking as a result of margin calls when asset prices fell.

Cyclical differences remained …

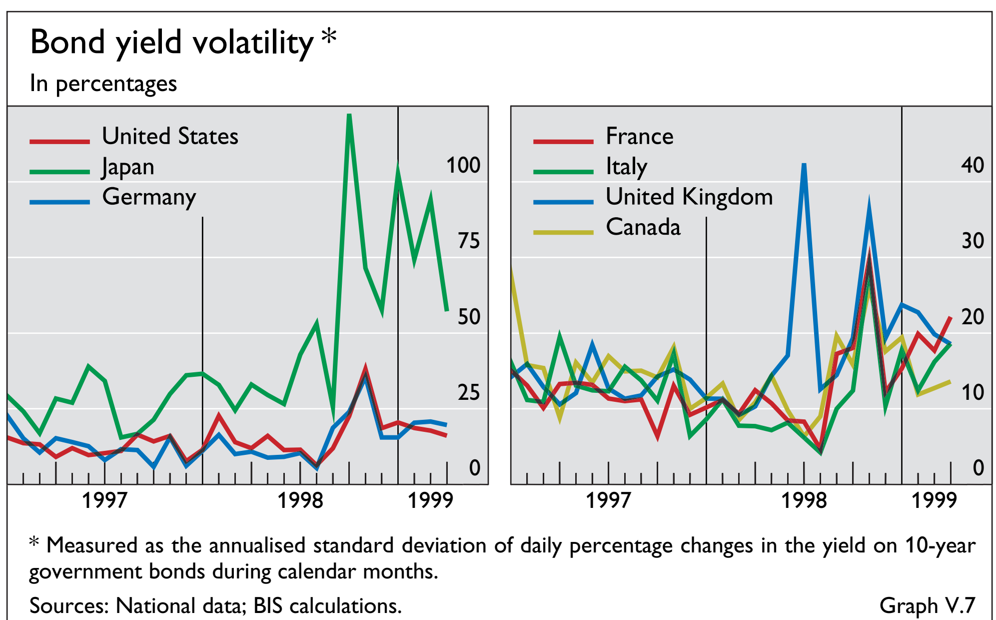
With marked differences across countries in both their cyclical positions and their sensitivity to losses in emerging markets, movements in long-term interest rates became much less synchronous when benchmark yields rebounded in the aftermath of the crisis. In the United States, the leveraged tendencies of both firms and households tended to exacerbate increases in bond yields after October 1998 in the context of a strong economy. In Europe, by contrast, changes in rates and spreads were much less pronounced, partly due to signs of weaker than expected economic activity but also supported by the cushioning influence of bank intermediated finance, traditionally more prominent on the European continent. In the euro area, the turnaround in bond yields did not manifest itself until the first quarter of 1999. The situation was different again in Japan. Government plans for fiscal expansion and bank



recapitalisation triggered a sharp steepening of the yield curve at the turn of the year, when the Ministry of Finance and the Bank of Japan temporarily changed their policy with a view to restricting the purchase and use of long-term government bonds by the latter.

… as calm returned to the markets

The gradual decline of spreads to pre-crisis levels from mid-October to the end of November revealed an uneven recovery in market confidence. Volatility measures abated significantly, though they remained at high levels in comparison with the first half of the year. In many cases policy actions played a significant role in restoring liquidity and persuading market participants that, on balance, world bond prices were more in line with fundamentals. In Europe and the United States markets reacted positively to the timing of monetary policy actions during the reverberations of the crisis. Similarly, the agreement



on an economic programme for Brazil signalled the international community's resolve to contain contagious forces, thus helping allay investor fears of an intensification of the emerging market financial crisis.

Nominal and inflation-adjusted real estate prices

	Nominal prices				Inflation-adjusted prices			
	1995	1996	1997	1998	1995	1996	1997	1998
	indices, 1994 = 100							
	Residential property prices							
United States	101	106	113	119	99	100	104	108
Japan[1]	97	96	94	91	97	96	93	89
Germany[2]	99	99	94	89	97	96	89	84
France	100	101	102	105	98	98	97	100
Italy	101	98	93	94	96	90	83	83
United Kingdom	101	104	114	127	97	99	104	112
Canada	95	95	98	97	93	92	93	91
Spain	104	105	107	112	99	97	97	100
Netherlands	104	114	125	133	102	110	118	123
Australia	101	102	106	114	97	95	99	105
Switzerland	95	90	85	85	94	88	83	82
Belgium	105	109	114	116	103	106	108	109
Sweden	100	101	107	118	98	98	104	114
Denmark	108	119	133	143	105	114	124	132
Norway	108	117	127	139	105	112	119	127
Finland	96	102	119	132	96	100	116	126
Ireland	107	120	139	171	105	115	132	158
	Commercial property prices: major cities							
New York	100	109	125	150	97	103	115	136
Tokyo[1]	83	72	66	59	83	72	65	58
Frankfurt	97	97	97	105	95	94	92	98
Paris	89	83	88	102	88	80	83	96
Milan	100	91	88	111	95	84	79	98
London	107	112	128	132	103	106	118	117
Toronto[3]	91	84	87	100	89	81	83	94
Madrid	100	118	128	183	95	109	116	162
Amsterdam	109	118	128	156	107	114	121	144
Sydney	102	106	113	118	97	99	105	109
Zurich	99	90	87	84	97	88	84	81
Brussels	100	106	109	109	99	102	104	103
Stockholm	129	137	163	185	126	133	158	179
Copenhagen	107	107	119	124	105	103	111	115
Oslo	108	115	131	119	105	111	123	110
Helsinki	105	107	111	121	104	105	108	116
Dublin	112	134	169	241	109	128	160	222

Note: 1998 data are preliminary for the Netherlands, Belgium and Denmark.

[1] Land prices. [2] Four major cities. [3] Price index for offices in Ontario.

Sources: National Association of Realtors; Frank Russell Canada Limited; Jones Lang LaSalle; Ministère de l'Équipement, des Transports et du Logement; Nomisma; OPAK; Sadolin & Albæk; Investment Property Databank Ltd; Wüest & Partner; other private real estate associations; national data.

Table V.3

Real estate markets

Property prices consolidated their rebound

In most industrial countries, real estate prices registered gains in 1998. However, in some countries current inflation-adjusted price levels remain below the peaks attained in the first half of the 1990s. Residential price increases have been the most pronounced in the Nordic countries, the United Kingdom and Ireland, while in most continental European markets valuations have simply kept pace with inflation. Land prices in Japan have continued their gradual but steady decline from the peak reached in 1990. Residential property prices currently stand at a 30% discount compared to that peak, while the harder-hit commercial real estate sector has retained little more than one-quarter of its peak value. The acceleration in the pace of price decline in Japanese commercial real estate over the last year, albeit small, has nevertheless renewed concerns that a turnaround in economic activity will be more difficult than anticipated given the sensitivity of the banking sector's balance sheet to real estate prices. Outside Japan, the performance of the commercial real estate segment has been generally more buoyant, with prices registering double-digit gains in many cities, frequently also marking the reversal of a recent declining trend. Strong demand for office space in combination with the relatively restrained pace at which new buildings have been made available in the recent past has supported such price gains.

Despite the impetus from strong fundamentals, real estate operators did not escape unscathed from the stress in financial markets during the second half of 1998. Premia in the US market for mortgage-backed securities doubled as investors demanded higher compensation for risk during August and the supply of new issues suffered a severe setback in the third quarter of the year. Similarly, the tightening of credit standards and terms of new loans by banks had an adverse impact on the ability of real estate investors to raise financing for new deals. Despite the mitigating influence of these factors, the price of commercial real estate rose by 20% in New York in 1998.

Features of financial markets under stress

Most financial contracts represent some form of intertemporal transfer of wealth and as a result financial market transactions are more sensitive to the shifts in participants' expectations about the future and confidence in the market process. This confidence is often reinforced during periods of enhanced profitability, when competitive pressures encourage risk-taking, while it can be shaken by events that call into question the prevailing assessment of risks. Dissipating investor confidence in the wake of such events creates powerful interactions between investors' assessment of the capacity of borrowers to honour their commitments and their expectations regarding the availability of willing trading partners in the secondary securities market. This in turn gives rise to atypical price dynamics which can further exacerbate market strains by invalidating previous projections of required capital based on assumptions that reflect normal market conditions, and by leading to a rush towards safety and liquidity. Such cycles are certainly not a new phenomenon, as financial history

offers many examples of feast–famine cycles. The new element is the increased vulnerability of today's financial structure stemming from the combination of the rapid growth of markets and institutions with the increased complexity and interdependency that characterises their relationships.

Swings in investor sentiment

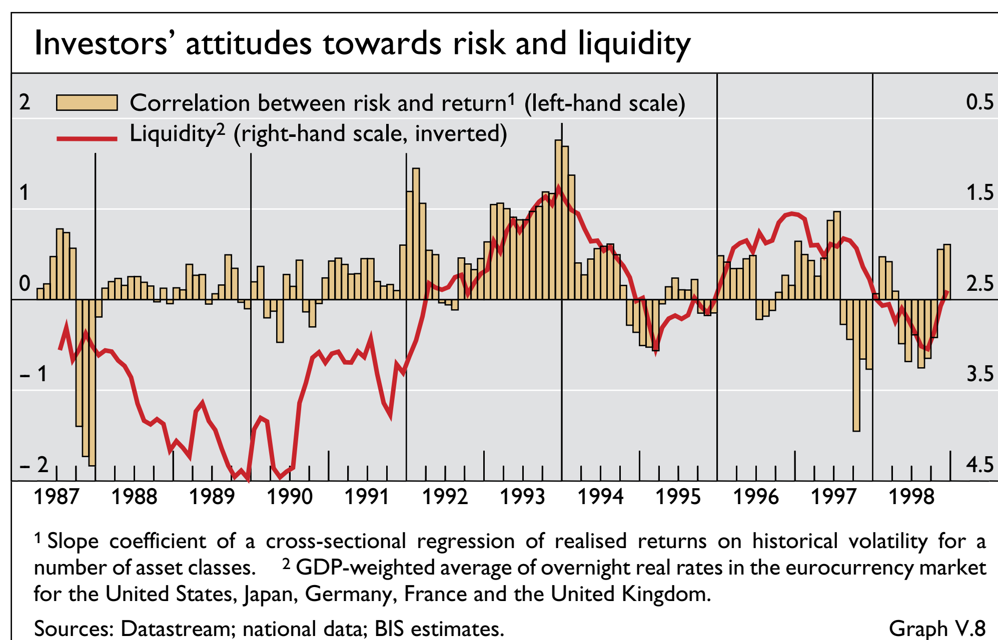
Changing attitudes towards risk ...

The combination of sharply increased risk and liquidity premia with declining rates of securities issuance for virtually all asset classes in the wake of the announcement of the Russian moratorium is suggestive of a large-scale retrenchment in the supply of risk capital. It is, however, difficult to reconcile the negligible fraction that rouble-denominated securities represented in global investment portfolios with the magnitude and the extent of strains experienced by mature financial markets. The importance of this event is, therefore, better understood in terms of its catalytic influence in prompting a fundamental re-examination of the appropriateness of risk and return trade-offs prevailing at the time. The announcement was interpreted as marking a shift in regime, given that the implementation of official support programmes had consistently prevented large unilateral sovereign defaults in the recent past.

... have an effect on asset prices ...

The average relationship between ex ante perceived risk and ex post realised returns for a cross section of financial asset classes can be used as an indicator of investors' attitude towards risk. This relationship is strongly positive in periods when concerns about risk are overcome by investors' appetite for higher yields. During such periods, improved investor sentiment stimulates interest in riskier asset classes, judged by their past record of higher volatility. By bidding up their prices, increased demand enhances disproportionately, if only temporarily, the realised returns on such assets. Conversely, returns on asset classes that entail greater risk suffer the most when market participants' apprehensions drive them to safety (Graph V.8).

Investors' attitudes towards risk and liquidity



[1] Slope coefficient of a cross-sectional regression of realised returns on historical volatility for a number of asset classes. [2] GDP-weighted average of overnight real rates in the eurocurrency market for the United States, Japan, Germany, France and the United Kingdom.

Sources: Datastream; national data; BIS estimates.

Graph V.8

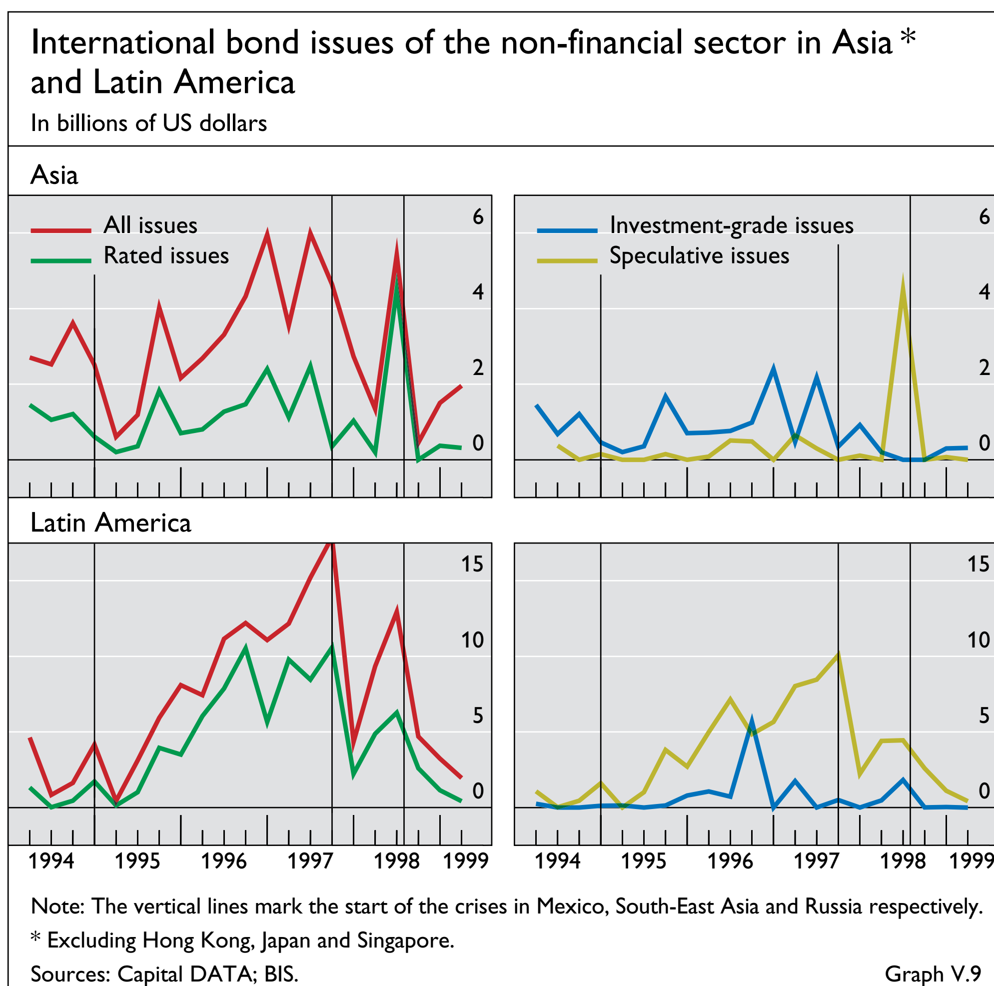
Sharp reversals in the indicator of market sentiment can be identified with a number of episodes of market turmoil in the recent past, such as the stock market crash in 1987, the bond market strains and the crisis in Mexico in 1994–95 and, more recently, the Asian crisis in 1997 and the events of last autumn. The apparent co-movement of market participants' attitude towards risk and money market liquidity in major financial centres suggests that their appetite for higher yields is often whetted by inexpensive leverage opportunities and is frequently reversed when these opportunities disappear. Low levels of interest rates may also encourage investors' apparent discounting of risk through their generally beneficial effect on portfolio valuations.

… and financial flows

The composition of borrowers and the volume of issuance in the primary international bond market can also be used to exemplify the impact of swings in investor attitudes towards risk on the general availability of risk capital. Some tiering in the increase of external finance costs reflecting differences in the perceived creditworthiness of borrowers would be a natural first sign of deteriorating market confidence. Some non-bank borrowers might even be shut out of the credit market altogether, leaving only the most creditworthy to launch new issues. The distribution of credit flows may be further accentuated by changes in the costs of financing for banks, insofar as they themselves rely on securities markets for raising funds.

International bond issues of the non-financial sector in Asia * and Latin America

In billions of US dollars



Note: The vertical lines mark the start of the crises in Mexico, South-East Asia and Russia respectively.

* Excluding Hong Kong, Japan and Singapore.

Sources: Capital DATA; BIS. Graph V.9

Graph V.9 shows the amount of bonds issued by the non-financial sector in Asia and Latin America broken down by credit rankings. In the period leading up to the crises, there was a sharp upsurge in sub-investment-grade issuance, mainly by sovereign borrowers in Latin America in 1997 and in both regions in 1998. To this extent, the crises of the last two years appear as corrections following earlier periods of speculative excesses and overextended portfolios. At the peak of the crises, differentiation between issuers seemed to depend less on the quality of the ratings than on their very existence. In all instances considered, the tightening of credit was primarily obtained through sharp reductions in the share of non-rated issues. Finally, in the period following the Russian debt default, the severity of deteriorating credit conditions was felt equally by investment-grade and speculative bonds, as the markets dried up almost completely. In particular, there were virtually no rated issues in the private non-financial sector. This feast–famine syndrome supports the view that the financial crisis of August 1998 was largely a supply-side phenomenon, driven by a reduction in the availability of risk capital and the threat of potential losses at banks and securities firms.

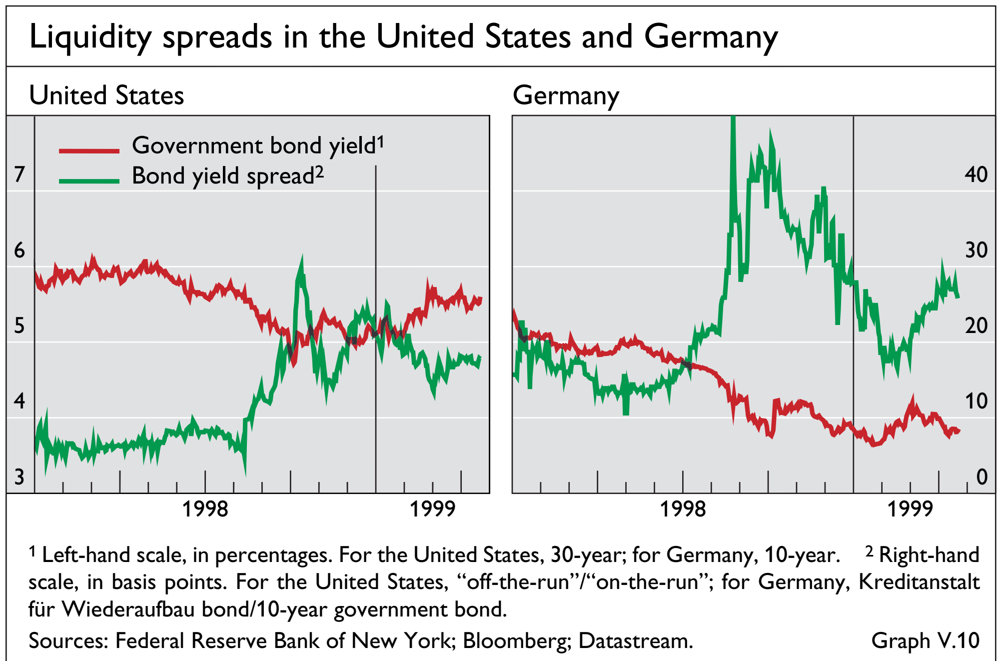
Flight to quality and liquidity

The generalised flight from risk when markets are under stress typically originates in well-identified concerns about credit quality but may later develop into a full-blown liquidity crisis. It is important to disentangle altered views of borrowers' creditworthiness from more generalised disruptions pertaining to the very functioning of credit markets. The interaction between credit risk and liquidity risk seems to have had an important bearing on the interdependencies between markets and the speed of crisis propagation over the last two years.

Departure from normal pricing relationships ...

A few pricing anomalies illustrate how the normal pricing relationship between spreads and counterparty risk broke down during the recent crisis, and also help delineate the boundary between a flight to credit quality and one to liquidity. First, in certain instances marked increases in spreads could not have been fully ascribed to credit risk, as they reflected lower yields on safe assets rather than increases in defaultable rates. Second, the yield differentials between the benchmark 30-year US Treasury bond issue and other less recent issues peaked at a level of over 30 basis points in mid-October, signalling an abrupt rise in investors' demand for the liquidity afforded by the "on-the-run" issue (Graph V.10). Similarly, the spread between the 10-year Kreditanstalt für Wiederaufbau bond and the German government benchmark issue of the same maturity more than doubled in a span of only two weeks last August. Since both bonds benefit from the same government guarantee, this rise must have been due to the former's lower liquidity in international bond markets. Finally, secondary market yields on the most highly rated corporate eurobonds converged sharply in September, and their subsequent strong co-movement suggested that their performance was driven by financial institutions' liquidity needs rather than the probability of default by individual corporations.

Marked increases in spreads also serve to highlight the complexities involved in the risk management practices of intermediaries. The surge in swap spreads in the United States and Europe was consistent with a global

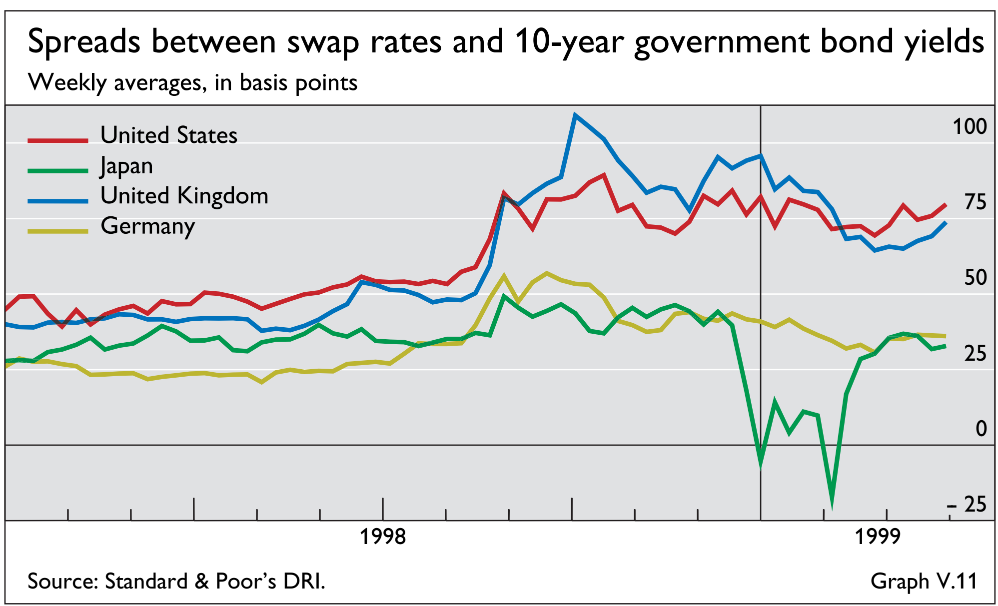


[1] Left-hand scale, in percentages. For the United States, 30-year; for Germany, 10-year. [2] Right-hand scale, in basis points. For the United States, "off-the-run"/"on-the-run"; for Germany, Kreditanstalt für Wiederaufbau bond/10-year government bond.

Sources: Federal Reserve Bank of New York; Bloomberg; Datastream. Graph V.10

… interferes with risk management practices

repricing of credit risk, to the extent that wholesale market players were themselves exposed to emerging markets and leveraged entities. However, the marked fluctuations observed in the German swap market cannot be explained by credit factors alone (Graph V.11). Indeed, they partly reflect a substitution of swaps for bund futures contracts as hedging instruments of choice for long positions in derivatives markets. With hedging costs soaring as a result of the widening of spreads and declining bund yields, market-makers had to fall back on swaps as a cheaper alternative to futures. Financial intermediaries, which stood as counterparties to market-makers, in turn held burgeoning long positions in swaps that had to be offset. This eventually resulted in a contagion effect in the swap market, as the concomitant sales of swaps depressed their prices, thus putting sharp pressure on their fixed rates.



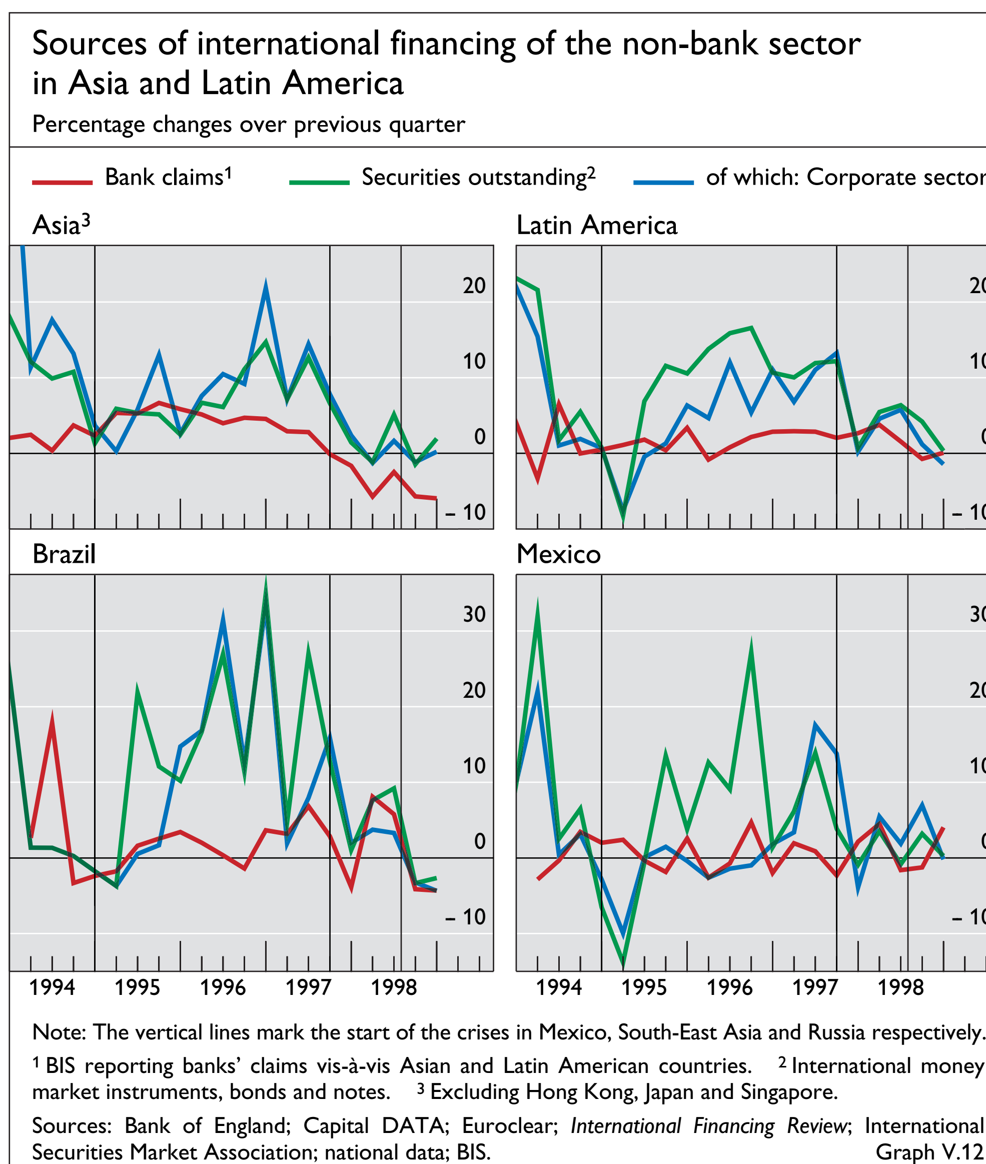
Source: Standard & Poor's DRI. Graph V.11

Relationship lending aspect of bank loans …

The pattern of net international financing in Asia and Latin America offers a few glimpses of the interdependencies at play between financial institutions and markets in different episodes when investors were withdrawing from risk. Financial liberalisation has encouraged borrowers to obtain funds at lower costs by tapping the international bond markets. However, a well-documented stylised fact is that riskier borrowers continue to rely on banks, because the latter are better at helping them in times of financial distress. This reliance may actually grow in periods of increased risk aversion characterised by high expected volatility. In those periods, the costs of loan renegotiations are generally lower than those of bond restructurings, which require a consensus among a variety of creditors. Banks also have long-standing relationships with their customers and often privileged access to information, allowing them to make better continuation/liquidation decisions than more impersonal markets. By contrast, bond investors' "frenzy of activity" as they search for high yields may well turn into a "fright" with a fire sale of assets should a crisis erupt.

Sources of international financing of the non-bank sector in Asia and Latin America

Percentage changes over previous quarter



Note: The vertical lines mark the start of the crises in Mexico, South-East Asia and Russia respectively.

[1] BIS reporting banks' claims vis-à-vis Asian and Latin American countries. [2] International money market instruments, bonds and notes. [3] Excluding Hong Kong, Japan and Singapore.

Sources: Bank of England; Capital DATA; Euroclear; *International Financing Review*; International Securities Market Association; national data; BIS.

Graph V.12

Graph V.12 provides some evidence pertaining to these observations using data from Asia and Latin America. Some broad features emerge. First, the stock of international debt securities has been more volatile than outstanding bank credit, in terms of both the amplitude and the dispersion of the swings. Banks have therefore been relatively supportive of borrowers, as suggested above. Second, the observed trend decline in the share of intermediated debt helps explain the increased sensitivity of the financial sectors in these countries to mercurial shifts in market sentiment. Third, unlike the period around the Mexican peso crisis and in the second half of 1997, when they partly compensated for the drying-up in international debt securities, banks did not appear to cushion the outflow of capital in the wake of the Russian moratorium.

… was put to the test during the crisis …

In some measure, this change in behaviour bears witness to the increased dependence of banks on global market conditions. A central feature of last year's episode seems to be that banks were constrained by the same funding problems that their customers were facing. Having made more loans than could be financed through existing deposits, both US and European banks ran into liquidity shortages which could not be dealt with by market-oriented solutions. The securitisation of assets and issuance of new securities were difficult at a time when equity indices in the banking sector were plummeting. Banks' financial slack including repayments on previous loans and all liquid assets in their portfolios was also directly impaired by the overhang of emerging market losses in the third quarter of 1998. Consequently, banks had to rely on a narrower set of financing sources, such as the recycling of funds through the international interbank market and the build-up of new direct deposits from non-bank investors.

… as banks' financial slack eroded

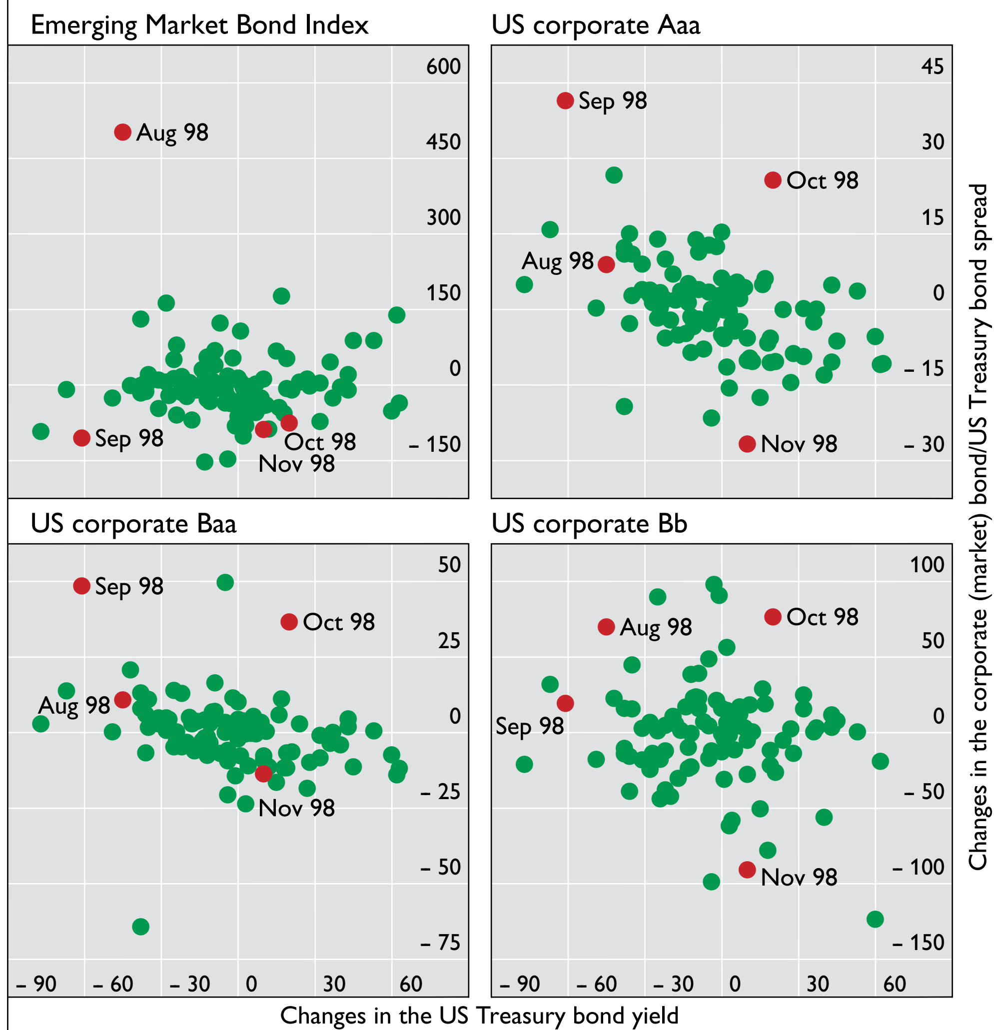
Atypical asset price dynamics

Market participants' reappraisal of risk following the Russian debt moratorium put substantial downward pressure on equity prices in all major markets. Although relatively uncommon, a simultaneous equity market correction across a majority of G7 economies is not an unprecedented phenomenon, as it was also observed in October 1987. A further similarity between the two episodes was the exceptionally high cross-country correlations of stock price changes. Global investors found considerably less benefit from international diversification of their equity holdings during this recent period of stress than they enjoy during more normal times.

Tighter co-movement of equity prices …

For fixed income markets, one aspect that sets this most recent episode apart from previous cases of market turmoil is the extent to which interest rate spreads widened as a result of investors' flight from risk. In the span of only a few days, required premia for credit and liquidity exposure reached levels close to historical peaks and in some cases even surpassed these peaks. In contrast with the bond market turbulence of 1994, when increasing interest rates in the United States and Germany exposed leveraged duration bets, last year's events took place against a background of declining nominal interest rates. An unusual constellation of market price dynamics for a range of asset classes played havoc with investment strategies and risk management systems based on historical statistical relationships (Graph V.13). As certain

… and unusual combinations of price dynamics in bond markets



Sources: JP Morgan; national data. Graph V.13

correlations across asset returns tightened and various spreads moved abruptly in the opposite direction to benchmark rates, projections of required capital cushions often proved inadequate, triggering a hastened search for liquidity by investors. At the same time, generalised uncertainty and heavily skewed demand for only the safest of assets quickly overwhelmed the capacity of a shrinking capital base of market-makers and intermediaries to accommodate these needs. The resulting credit crunch in the form of higher margin calls and curtailment of credit lines forced investors to raise required funds by selling securities in markets that initially appeared to be relatively liquid, thereby transferring the strains to the government bond markets of advanced industrial countries.

The LTCM episode: a sign of the times?

The near-failure of the Long-Term Capital Management hedge fund prompted intervention by the Federal Reserve Bank of New York to facilitate a private sector solution as an alternative to a disorderly bankruptcy. The event provides

a vivid example of the nature of problems that can arise given the complexity of today's financial markets. Although they are not new institutions by any means, recent attention to hedge funds is a result of the growth in their size and in their capacity to affect the functioning of markets. By some estimates there were at least 1,200 hedge funds with own assets of over $150 billion by mid-1998. These institutions are speculative funds that sidestep certain disclosure and leverage regulations by limiting their clientele to a small number of wealthy investors and frequently by operating offshore. They seek high rates of return by investing in a variety of financial instruments using considerable amounts of borrowed funds.

An example of the opportunities …

LTCM, in particular, appears to have pursued high returns by making directional judgements on interest rate spreads and the volatility of market prices. Since its founding in 1994, it had been able to generate consistently above normal returns of the order of 40% in 1995 and 1996 and 20% in 1997. The fund relied on very high levels of leverage to achieve these returns. Its balance sheet on 31 August 1998 included over $125 billion in assets. This implies a leverage ratio of more than 25:1 based on its $4.8 billion capital at the beginning of the year, disregarding the losses it incurred prior to August and excluding its off-balance sheet exposures. The performance record of LTCM, together with its reputed use of highly technical pricing models and trading strategies, made it a symbol of how profitable financial sophistication could be.

… and pitfalls in today's market-place, where …

Equally symbolic, in this case of the dangers of the new financial landscape, has been the near-failure of the fund. The unusual price correlations that followed the Russian debt moratorium caused problems for many financial institutions, particularly those employing a high degree of leverage. In the case of LTCM, they nearly led to the failure of the fund. Although it had invested in a wide range of securities, the fund based its strategy on an expectation of declining credit spreads and asset market volatility. This expectation was abruptly proved wrong by market developments in August. The rapid sequence of events that surrounded the fund's near-collapse illustrates well the greater speed of financial crisis propagation and the consequent narrowing of the time frame for corrective action. The first public signs of the fund's difficulties emerged after 2 September with the surfacing of the contents of a letter sent by the LTCM partners to their investors. That letter acknowledged that the fund had experienced 52% losses from the beginning of the year to 31 August and that it was seeking an injection of capital. Between 2 and 23 September, when 14 banks and securities firms agreed to inject $3.6 billion in order to recapitalise the fund, there was a growing sense of urgency in finding an orderly resolution. News of the fund's increasing difficulties was spreading, as were concerns about the instability that could arise if it were put into default and its counterparties were forced to close out their positions in an abrupt and disorderly manner. Moreover, it was felt that the liquidation of any collateral held by these counterparties, as well as the unwinding of positions similar to those of LTCM held by other institutions, would have put undue pressure on already strained financial markets and compounded participants' nervousness.

… strains propagate faster …

… and spread wider than before

The uncertainty about the potential ramifications of a disorderly bankruptcy of LTCM, in particular the concern that its impact would have extended to market participants not directly involved with the hedge fund and beyond the borders of the United States, is illustrative of how inextricably interdependent institutions and markets have become. Uncertainty was driven mainly by the scale and scope of LTCM's operations, which encompassed many financial instruments and spanned a variety of markets, as well as by the nature of its operations, which included many complex contracts. But uncertainty was also compounded by the condition of the financial markets, which were still suffering from the instability resulting from the events of the previous month. The risk of widespread financial troubles that could have arisen if the hedge fund had suddenly defaulted helps explain the willingness of a number of private sector firms to contribute to an orderly resolution through a process facilitated by the central bank.

Lessons from the crisis in September and October 1998

What took both market participants and policymakers most by surprise during last year's episode of market turbulence was the extent to which conditions deteriorated and the speed with which liquidity evaporated in several market segments. The events of last year highlighted the key role of heightened credit risk and extensive leverage in determining financial market dynamics in periods of abrupt shifts in investor sentiment. Moreover, they underscored the systemic importance of market-making institutions. Looking at the crisis and the subsequent recovery together also raises critical questions about the appropriate policy response to financial market fragility and current valuations.

Credit risk and market risk

In spite of the attention devoted to equity market valuations before last summer, the actual trigger for the crisis was the announcement of a borrower's default. The events that followed were principally driven by investors' reassessment of credit risk. The essential difference between market risk and credit risk is that, while the former is concerned mainly with the structure and dynamics of asset price volatility, the latter relates to market participants' uncertainty regarding borrowers' and counterparties' capacity to deliver value. It is no coincidence that fixed income and derivatives markets, where sensitivity to credit risk is more apparent, were the ones most affected by the turbulence and are also the ones that are suffering any lasting consequences in its aftermath. These events also illustrated how market dynamics triggered by generalised concerns about credit risk can give rise to unusual constellations of price movements. Risk management systems that have been primarily designed to measure and control market risk are not always appropriate to characterise price behaviour under these market conditions. Such systems may actually contribute to the strain as they imply that investors should scale down portfolio risk by liquidating their positions in a declining market.

Leverage

The unfolding of the crisis exposed the extent to which market participants had taken advantage of a wide variety of leverage methods, seeking to enhance the return on capital, as well as the problems that arise when a reversal in market conditions prompts an unwinding of their positions.

Permissive attitudes towards risk by lenders had generally reduced the cost and increased the availability of finance. In many cases, intensified competitive pressures tempted lenders to blunt the sharpness of their instruments designed to mitigate and control credit exposures. High levels of gearing, implicit in strategies that made extensive use of derivatives and financing of positions through short sales of securities, compounded losses as prices of riskier asset classes declined while government bonds issued by the major industrial countries became more expensive. Increased margin calls and in some cases the deteriorating value of posted collateral sent investors scrambling for liquidity, spreading the impact of this deleveraging to other market segments.

Market-makers

Another important characteristic of this most recent episode of turbulence was the fact that the functioning of some specific market segments was severely impaired, sometimes to the point of complete seizure. Institutions that typically specialise in facilitating the exchange between buyers and sellers saw their ability to perform a market-making function curtailed by the limitations of their capital base in the face of one-sided demand. Furthermore, in several over-the-counter and derivatives markets, the situation was further complicated by the fact that market-making had to some extent been performed de facto by leveraged participants such as LTCM, by virtue of the size of their positions (see Chapter VII). The urgent quest for liquidity by such participants further intensified market strains.

Finally, it is important to recognise that the recovery of many markets has been nearly as spectacular as their fall. Equity prices in almost all advanced economies have regained lost ground and in many cases have reached new highs. The spreads of corporate and emerging market bonds have fallen back from their peaks and, while they have not returned to pre-crisis levels, borrowers have met with an increasingly warm reception from investors. This recovery in itself raises a few questions regarding the correct interpretation of the crisis episode. One interpretation would view the subsequent recovery as an indication that the turmoil was the result of inherent dynamics in the behaviour of financial market participants. In this case the relevant policy issues are how to prevent, if possible, the recurrence of these phenomena and how best to promote the resilience of the financial system to such crises. If, on the other hand, the crisis was a warranted reaction to changing economic fundamentals, then current valuations may prove to be as fragile as those prevailing in early summer last year.