

V. Foreign exchange market developments

Highlights

The strength of the yen, the weakness of the euro and the intermediate position of the US dollar were the salient features in the major foreign exchange markets in 1999 and early 2000. The movements in the main exchange rates seem to have been primarily determined by the interaction of current and prospective relative cyclical positions, along with technical factors as well as portfolio and foreign direct investment (FDI) flows. Market perceptions of changes in underlying structural characteristics of the three major economies may also have played a role. In emerging market countries, foreign exchange markets returned to calmer conditions after the periods of turbulence in 1997, 1998 and early 1999. Local stock markets moved closely with US equity prices and with the dollar exchange rate of the domestic currency.

Over the last two years, foreign exchange markets have been affected by significant structural changes, including the introduction of the euro, the trend towards concentration among market players and the increasing role of electronic broking. While these changes were also accompanied by a general reduction in trading activity, it is too early to determine their impact on general patterns of exchange rate volatility.

The price of gold trended downwards in the first three quarters of 1999 but rose sharply in late September following an agreement limiting official gold sales over the next five years. While there were occasions when news about central bank gold sales seemed to influence the gold price, this relationship was by no means systematic.

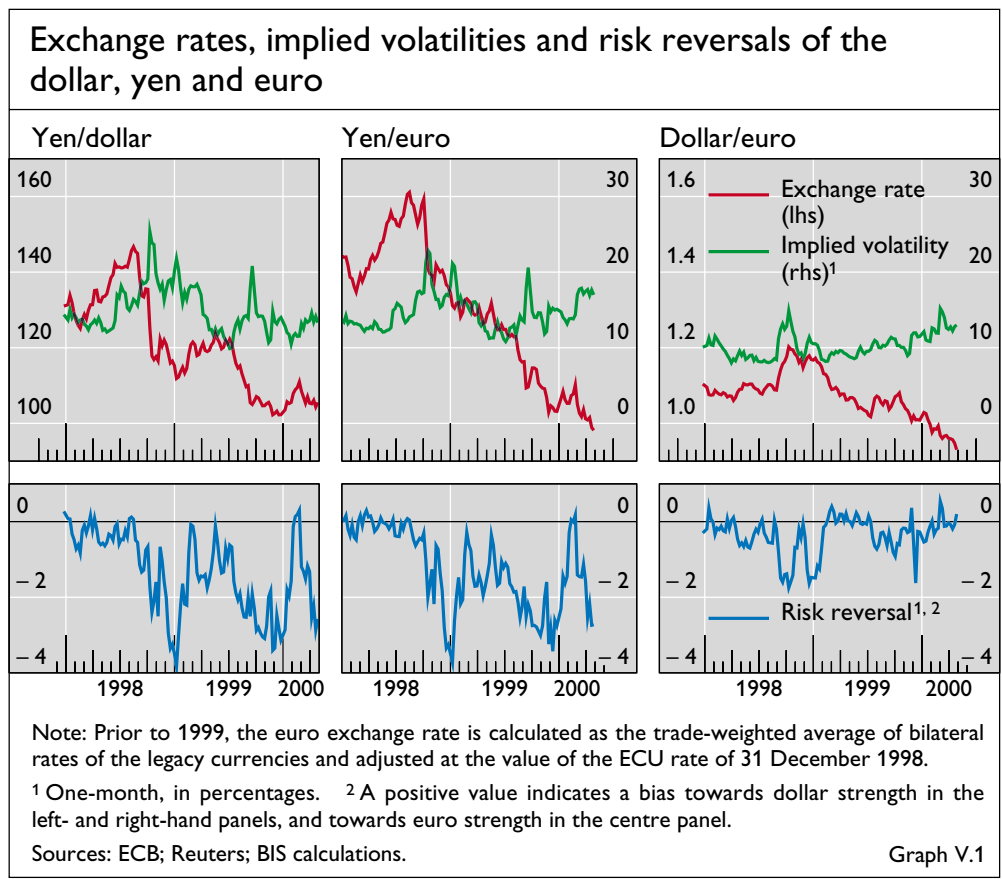
The dollar, yen and euro

The movements of the main currencies in 1999 and early 2000 were influenced by cyclical factors and associated expectations of monetary policy adjustments in the United States, Japan and the euro area, but also by technical factors and portfolio and FDI flows. The euro's exchange rate may also have been influenced by negative market sentiment based on views about lagging structural adjustments in continental Europe.

Key developments and long-term perspectives

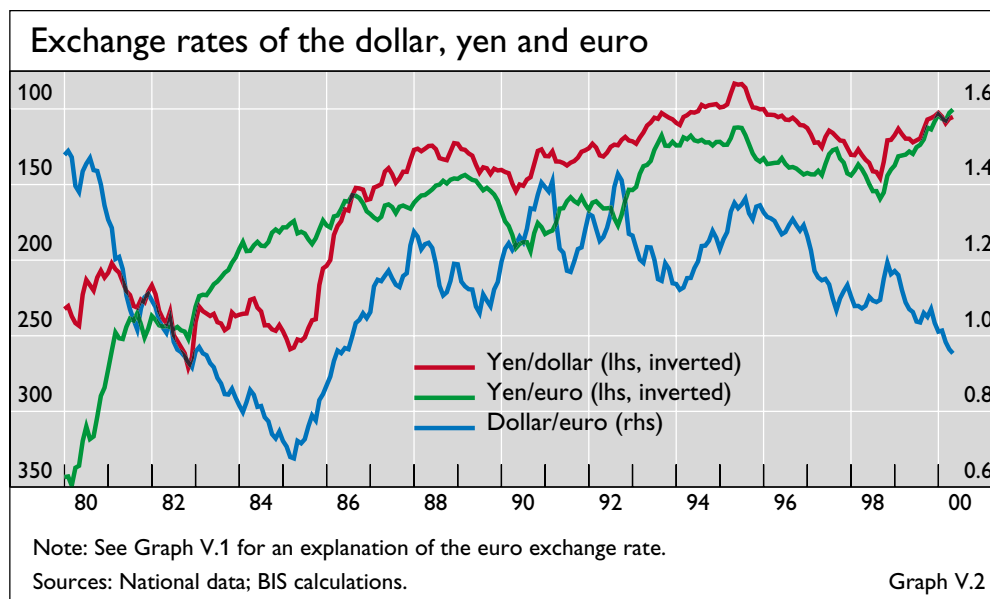
The major exchange rates swung substantially during the period under review (Graph V.1). In the first half of 1999, the dollar strengthened by about 14% against both the yen (from ¥109 to ¥124) and the euro (from \$1.18 to \$1.03). By contrast, it was the yen which appreciated markedly during the second half of 1999, reaching ¥102.30 per dollar and ¥102.70 per euro by year-end.

Wide exchange
rate swings



Although the euro recovered some ground against the dollar between June and September, it weakened again in the last quarter of 1999. In the first four months of 2000, the yen's appreciating trend became more muted, while the euro fell significantly below parity with the dollar. The euro's weakness throughout the period confounded earlier general expectations that it would trend upwards. Moreover, risk reversals suggest that, even during most of 1999, option traders were willing to pay more for exposure to (or insurance against) a much stronger rather than a much weaker euro vis-à-vis the dollar (Graph V.1, lower panel).

From its lows in 1998 to its highs in early 2000, the yen posted an almost 45% gain against the dollar and a 65% appreciation against the euro. The amplitude of these swings in the major exchange rates was noteworthy, but not unprecedented. At the levels reached in early 2000, the yen appeared to be very strong by historical standards, having reached values against the dollar that were exceeded only in 1995. Moreover, taking a "synthetic" euro as the benchmark, the yen posted a record high against the euro (Graph V.2). Using the same benchmark, the euro touched a 13-year low against the dollar in March 2000, but was still trading well above its all-time low reached in the mid-1980s. The dollar's intermediate course – a depreciation against the yen accompanied by an appreciation against the main European currency – was last seen in summer 1997, when the yen rose significantly against the dollar and even more against the mark following a turn in sentiment (in the event erroneous) about a prospective recovery of the Japanese economy.

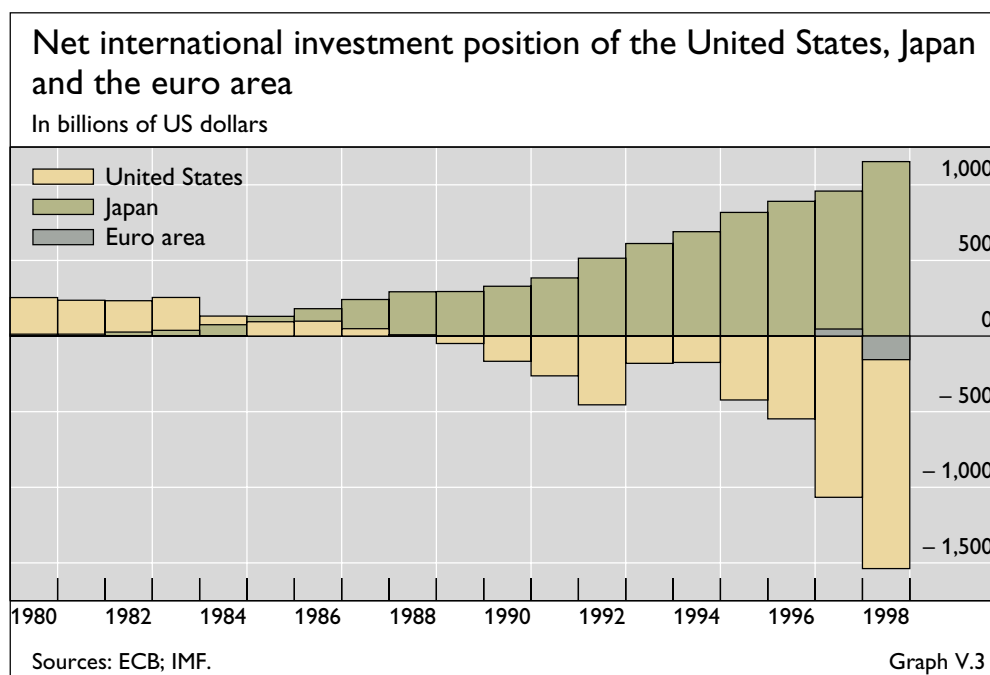


Short-run ...

From the viewpoint of redistributing world aggregate demand from the strongly growing US economy to economies with insufficient demand, the dollar's continuous appreciation against the euro and, during the first half of 1999, against the yen was desirable for the global economy. Conversely, the strengthening of the yen from June 1999 is likely to have restrained demand for Japanese products at a time when the economy was not yet showing signs of self-sustaining growth.

... and long-run perspectives

In a longer-term perspective, the widening US current account deficit and the build-up of US external liabilities (Graph V.3) raised the issue of the sustainability of current exchange rate levels. Evaluating the longer-term appropriateness of exchange rate levels is generally difficult in the absence of precise estimates of long-term equilibrium exchange rates. In terms of their real effective exchange rates, in 1999 the dollar exceeded by 11% and the yen



Official foreign exchange reserves					
	1996	1997	1998	1999	Amounts outstanding at end-1999
in billions of US dollars					
	Changes, at current exchange rates				
Total	172.3	62.4	58.4	127.5	1,746.0
Industrial countries	69.6	-12.0	-10.5	46.1	704.7
Asia ¹	64.4	8.5	62.2	79.1	642.0
Latin America ²	18.4	16.5	- 8.4	-8.0	124.7
Eastern Europe ³	-2.6	4.9	5.1	0.8	74.3
Other countries	22.5	44.5	9.9	9.4	200.3
	Changes, at constant exchange rates ⁴				
Total	200.3	121.2	21.0	159.4	1,746.0
Dollar reserves	161.7	87.6	40.2	191.1	1,358.9
Non-dollar reserves	38.7	33.7	-19.2	-31.7	387.1
Note: Flows calculated for 1999 exclude the reduction in reserves due to the disappearance of holdings of legacy currency reserves of EMU member countries.					
¹ China, Hong Kong, India, Indonesia, Korea, Malaysia, the Philippines, Singapore, Taiwan and Thailand.					
² Argentina, Brazil, Chile, Colombia, Mexico and Venezuela. ³ Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Russia, Slovakia and Slovenia. ⁴ Partly estimated; valued at end-of-year exchange rates.					
Sources: IMF; national data; BIS.					Table V.1

by 4% their respective averages over the last decade, while the euro appeared to be about 4% below its 1990s average.

Estimates of the fundamental equilibrium exchange rate (FEER), which try to identify the real exchange rate level that is compatible with a stable ratio of external debt to output in the long run, can vary considerably and can therefore provide only very tentative evidence. According to FEER calculations, the yen/dollar exchange rate observed in April 2000 was close to its long-term equilibrium level, while the dollar appeared substantially overvalued vis-à-vis the euro. The latter finding must, however, be further qualified in that net income on the US external position turned negative only in recent years and is still very small in terms of GDP, as US investments abroad have traditionally yielded higher returns than foreign investment in the United States.

Private and official investors apparently remained more than willing to finance the current account deficit in the United States, which rose to \$339 billion in 1999. Official foreign exchange reserves held in dollars rose strongly, particularly in Asia (Table V.1). Private investment flows into the United States also surged (see Chapter II), with FDI equivalent to about 40% of the US current account deficit, which reduced the country's overall dependence on portfolio inflows. However, the sharp increase of international flows to US equity markets raised concerns about the impact of possible strains in these markets on the future financing of the external deficit (see below).

Factors driving exchange rate movements

The dollar's strength against the euro and its appreciation against the yen during the first half of 1999 were consistent with the strong performance of

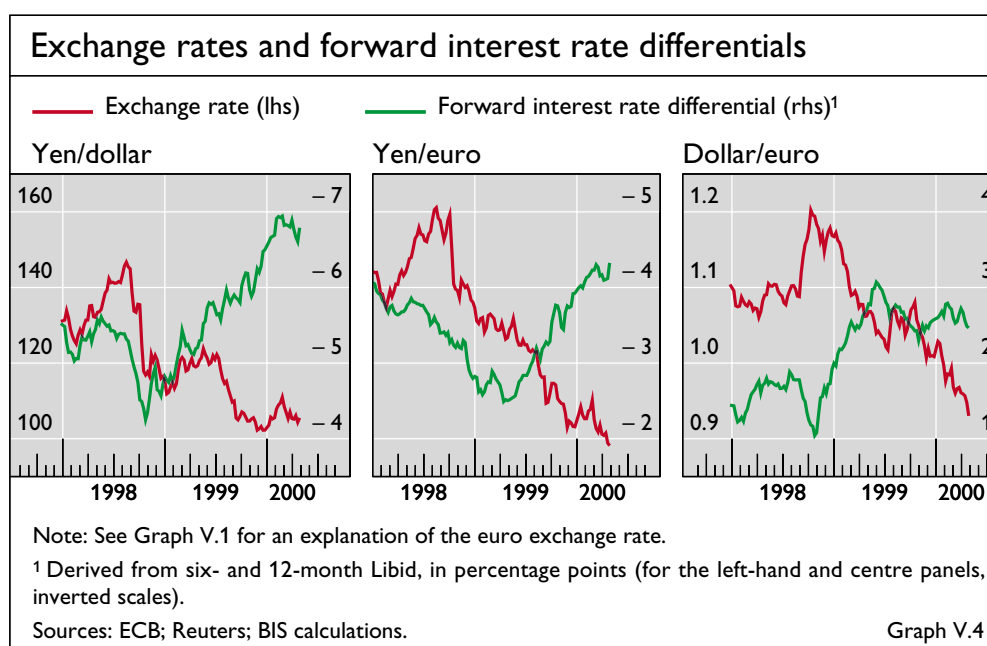
Changing views about the cycle

the US economy compared with slower growth in the other areas. Moreover, continuing positive surprises about US growth in 1999 contrasted with more mixed signals in the euro area and Japan, and underpinned the widening of short-term interest rate differentials in favour of the dollar (Graph V.4).

The yen's sharp rise after June 1999 can to some extent be attributed to a narrowing of expected growth differentials between the United States and Japan (Graph V.5). By contrast, the euro continued to weaken in late 1999 in spite of unchanged expectations regarding differences between euro area and US growth. It is also true that, particularly in the second half of the year, the euro did not seem to respond in a systematic fashion to positive news about macroeconomic developments. In part this may have reflected a persistent and excessive focus by foreign exchange market traders, as well as portfolio managers, on developments in the German economy, on which they had traditionally tended to concentrate their attention. On 28 January 2000, for example, the euro fell several cents and broke dollar parity, although on the same day there were several positive macroeconomic data releases in other euro area countries. From January to March 2000, the euro weakened further in spite of a narrowing of forward rate differentials between the euro area and the United States.

Technical factors influence short-term dynamics

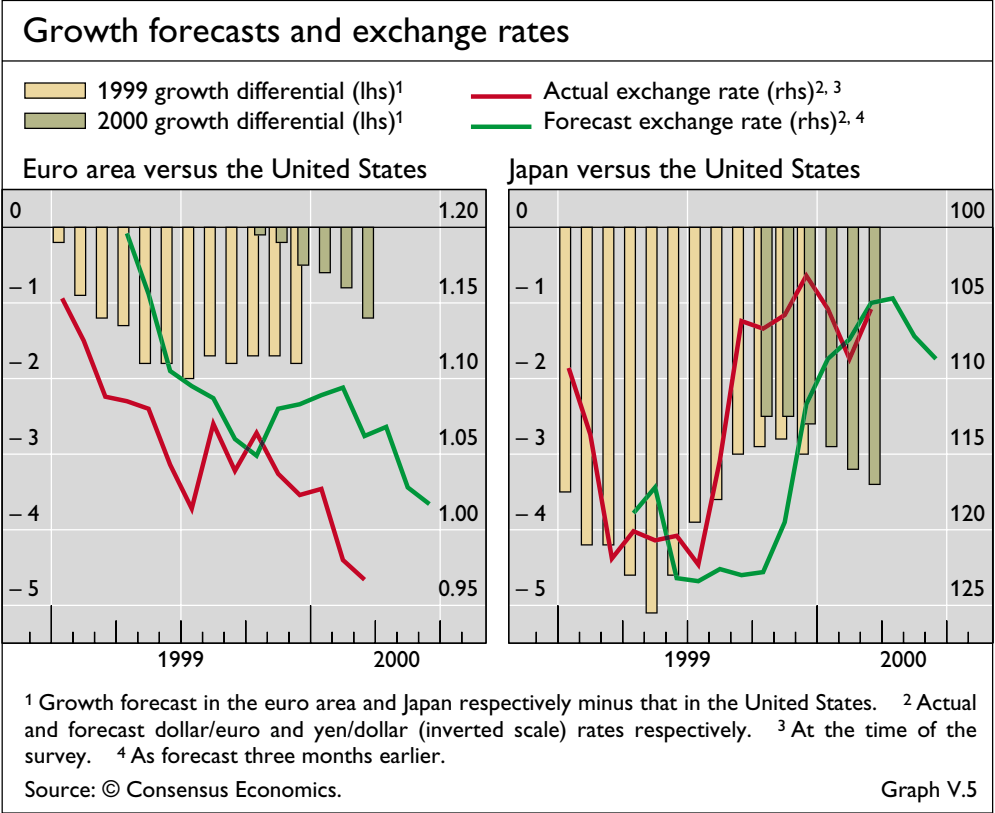
Technical factors might also help explain part of the exchange rate dynamics of the three major currencies during the period under review. The unwinding of yen carry trades, possibly by hedge funds, as the yen trended upwards after June 1999 may at times have intensified the yen's appreciation. Stop-loss orders around symbolic levels such as euro/dollar parity or an implicit mark/dollar exchange rate of DM 2.00 appear to have reinforced the momentum of the euro's depreciation. The dynamics of traders' expectations may occasionally have played a role in early 2000. Dollar/euro risk reversals give an indication of option traders' balance of weight on a much stronger and a much weaker euro against the dollar with respect to the forward rate. These

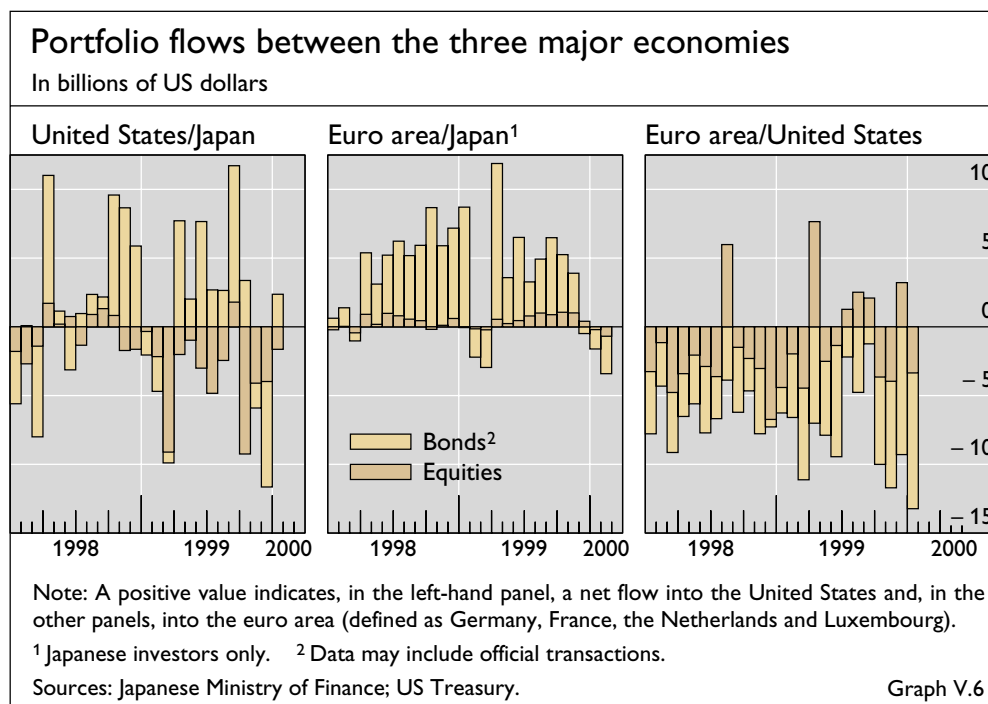


risk reversals suggest extrapolative fears about the euro at times when the currency fell sharply (Graph V.1). The repatriation of funds by Japanese institutions ahead of the fiscal year-end in March 2000 may also have reinforced the yen's strength. On 28 February 2000, the limited size and liquidity of the euro/yen market magnified a sudden jump in the value of the yen vis-à-vis the euro, leading to a temporary exchange rate change of about ¥3 in the space of a few hours.

Nevertheless, while such technical factors can have an important influence on short-term exchange rate dynamics, their influence is typically short-lived. It is therefore likely that the medium-term swings of the major exchange rates were driven by other determinants, such as the dynamics of international investment flows, that were only partly related to cyclical considerations. The large-scale net purchases of Japanese equities by US investors in 1999, which outweighed net purchases of US bonds by Japanese investors, may have contributed to the dollar's depreciation against the yen (Graph V.6). Likewise, the dollar's strength against the euro is consistent with substantial portfolio investment flows from the euro area to the United States in 1999 and early 2000. These were the result of net purchases of US bonds and equities by euro area investors, as well as net sales of euro-denominated assets by US investors. The influence of portfolio flows on the euro was compounded by the even greater flow of foreign direct investment, with FDI inflows of \$130 billion into the United States compared to outflows of €147 billion from the euro area in 1999 (see also Chapter II). However, while the direction of net flows related to mergers and acquisitions involving US and European companies is consistent

The role of portfolio flows and FDI





with the euro's weakness against the dollar, announcements of such deals or reports of cash transactions did not seem to have a systematic impact on the exchange rate.

The broad movements of international investment may have been affected not only by cyclical considerations but, in particular for FDI, also by the perception that structural changes were proceeding more rapidly in some currency areas than others. The direction of net portfolio flows away from continental Europe towards Japan is consistent with market participants' optimistic views about corporate restructuring in Japan. These contrasted with the markets' more sceptical assessment of progress on structural reforms in the euro area. Portfolio outflows from the euro area in part may also reflect US investors' disappointment about losses on euro-denominated assets in 1999 and surprising gains on Japanese assets. On the other hand, Japanese investors bought euro-denominated assets during the period under review, except in the months preceding the 1999 fiscal year-end.

In the case of the euro, the influence of international investment flows was compounded by the attitude of liability managers. A strong increase in issuance in euros in 1999 in comparison with its predecessor currencies could be observed in both the private and the official sectors (see Graph VII.4 on page 128). While the lack of information on hedging by liability managers makes any inference from this issuance with regard to exchange rate movements difficult, the imbalance between the responses of borrowers and lenders to the introduction of the euro may have been an additional factor weighing on the new currency.

Stock markets and exchange rates

The role of portfolio flows in recent exchange rate movements coincides with a shift in international investment from bond to equity markets (Table V.2). This

Co-movement ...

Cross-border transactions in bonds and equities ¹								
	1975–79	1980–89	1990–94	1995	1996	1997	1998	1999 p
as a percentage of GDP								
United States								
Bonds	4.0	36.5	94.0	110.2	129.0	163.6	166.3	125.8
Equities	1.9	6.7	14.7	22.4	27.2	44.3	56.5	53.1
Japan								
Bonds	2.2	63.3	74.5	55.2	66.1	78.3	72.4	56.0
Equities	0.6	9.7	9.8	9.6	13.4	17.1	18.2	29.1
Germany								
Bonds	5.3	25.0	87.3	148.8	171.0	211.6	259.1	250.9
Equities	1.6	7.3	15.2	18.5	24.8	44.7	69.8	83.4

¹ Gross purchases and sales of securities between residents and non-residents.
Source: National data. Table V.2

raises the broader issue of the relationship between equity markets and exchange rates, given the concern that a fall in US equity markets coupled with a weakening dollar could potentially exert a deflationary influence on the rest of the world.

The extent to which stock markets and exchange rates move together varies widely across countries. Over the last 25 years, the correlation of monthly returns on stock market indices and changes in the value of the domestic currency, measured in terms of the nominal effective exchange rate, is positive in Australia, Canada, Japan, Italy and the United Kingdom, but negative in the United States, Germany and some other continental European countries (Table V.3). Over this horizon, stock market returns generally explain between 5 and 20% of monthly exchange rate returns in the countries considered.

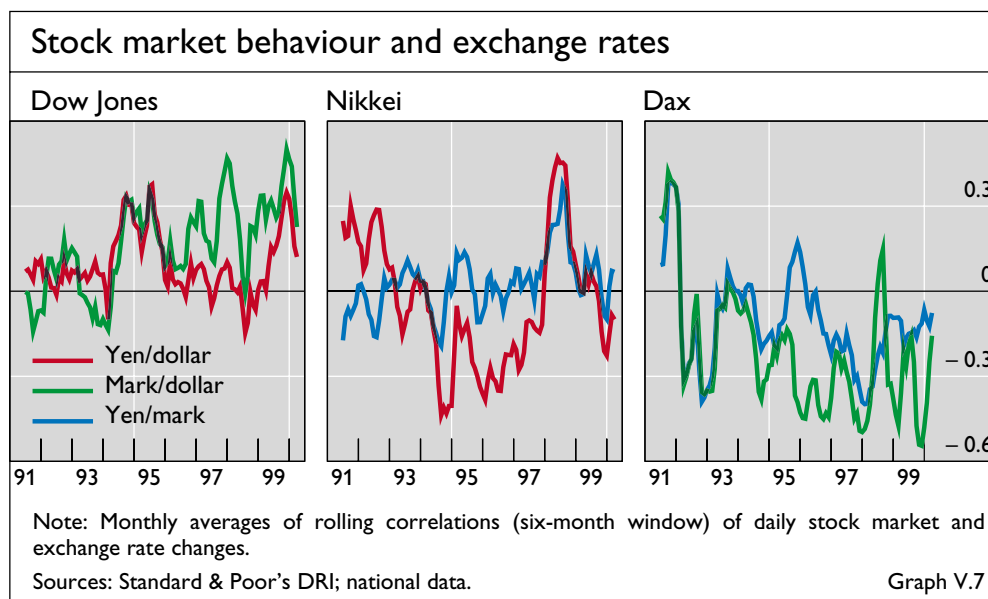
... varies across countries ...

The sign and strength of the statistical relationship between stock market returns and exchange rate changes also vary considerably over time (Graph V.7). Daily returns on the US stock market moved quite closely with changes in the value of the dollar vis-à-vis the yen and the mark in the mid-1990s. The co-movement of US equity markets and the dollar intensified again during 1999, when almost half of the daily movements in US stock prices were matched by changes in the yen/dollar or mark/dollar exchange rates. However, this correlation weakened considerably in early 2000, when episodes of falling US stock prices were not accompanied by a depreciation of the dollar. It is noteworthy that the same pattern shown for the Dow Jones index in Graph V.7 can

... and over time

Stock markets and exchange rates in selected industrial countries ¹									
AU	CA	JP	IT	GB	FR	US	SE	CH	DE
0.20**	0.17*	0.11*	0.10	0.06	-0.02	-0.06	-0.08	-0.09	-0.15**

Note: For an explanation of the country codes, see Graph II.2. * and ** mean statistically significant at the 95% and 99% level respectively.
¹ Correlation coefficients over the period 1975–2000 of monthly returns on stock market indices and nominal effective exchange rates defined as log differentials.
Sources: National data; BIS; BIS calculations. Table V.3



also be observed for the broader S&P index and the Nasdaq index, which gives more weight to shares in the high-tech sector.

The pattern of correlations of daily movements of the Japanese and German stock markets with the yen and the mark (or euro) looks different. Returns on the Nikkei and on the yen vis-à-vis the dollar moved together in 1996 and 1997, when a downward trend in Japanese equity markets was accompanied by a weakening of the yen. Contrary to the Dow Jones and the dollar, however, daily changes in the Nikkei and the yen were not closely correlated in 1999. Results for the German stock market and the mark are even less clear-cut, as upward movements in the Dax during the last five years have often been positively correlated with changes in the mark against the dollar, but not against the yen. Moreover, the euro's depreciation in 1999 contrasted with the upward trend of the Dax (and other stock market indices in the euro area).

Overall, these results suggest that the relationship between exchange rate movements and stock market returns is weak. The movements of the major bilateral exchange rates do not appear to be influenced to any significant extent by the performance (be it absolute or relative) of the US, Japanese and German stock markets. Moreover, the time pattern of these correlations does not support the conclusion that they were broadly driven by key macro-economic fundamentals, such as the cyclical performance, or by the relative monetary policy stance.

Developments in other foreign exchange markets

Movements of the major European currencies outside the euro area were to a large extent driven by cyclical factors. Currencies of other industrial countries responded, in addition, to changing trends in commodity prices. In emerging market economies, currencies remained fairly stable, reflecting improved domestic conditions, higher commodity prices and ample global liquidity

Overall, the relationship is weak

conditions. Local stock markets in these countries moved fairly closely with US equity markets and with the dollar exchange rate of the domestic currency.

European currencies

The pound sterling has experienced a prolonged period of sustained strength, against the background of an economy operating near full capacity and high short-term interest rates relative to other industrialised economies. Between January 1999 and March 2000, the currency appreciated by about 15% against the euro (Graph V.8) while remaining fairly stable against the dollar, and in real effective terms came close to the record level set in 1980. In both its broad swings and its daily movements, the pound is maintaining an intermediate position between the dollar and the euro, as it did with the mark in the past, when sterling tended to share about one half of the daily changes of the dollar against the mark.

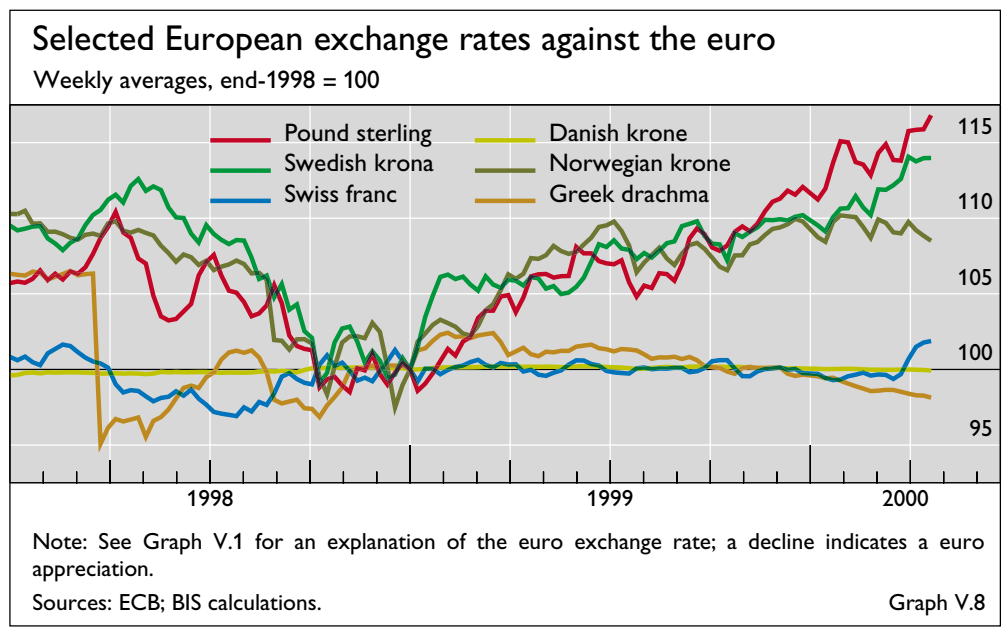
Cyclical developments supported the pound ...

Somewhat like sterling, the Swedish krona appreciated steadily vis-à-vis the euro during the period under review, against the background of positive growth differentials between Sweden and the euro area (see Chapter II). Overall, the co-movement of the krona with the euro appears similar to its past link with the mark. On average, for every 1% depreciation of the euro against the dollar, the krona tended in 1999 to depreciate by about 0.7% against the dollar.

... and the krona

In 1999, the Swiss franc moved mostly within a narrow range of 1.59–1.61 against the euro and on average matched the euro's daily changes against the dollar. The closer co-movement of the Swiss franc and the euro was associated with fairly synchronous monetary policy moves during the year. This contrasted with the behaviour of the Swiss franc observed in the past, when it tended to depreciate (appreciate) against the mark when the German currency weakened (strengthened) against the dollar. The large shift in trading volumes away from the euro's most heavily traded legacy currency, the mark, towards the dollar confirmed foreign exchange traders' view that a tighter link

The changing link between the Swiss franc and the euro

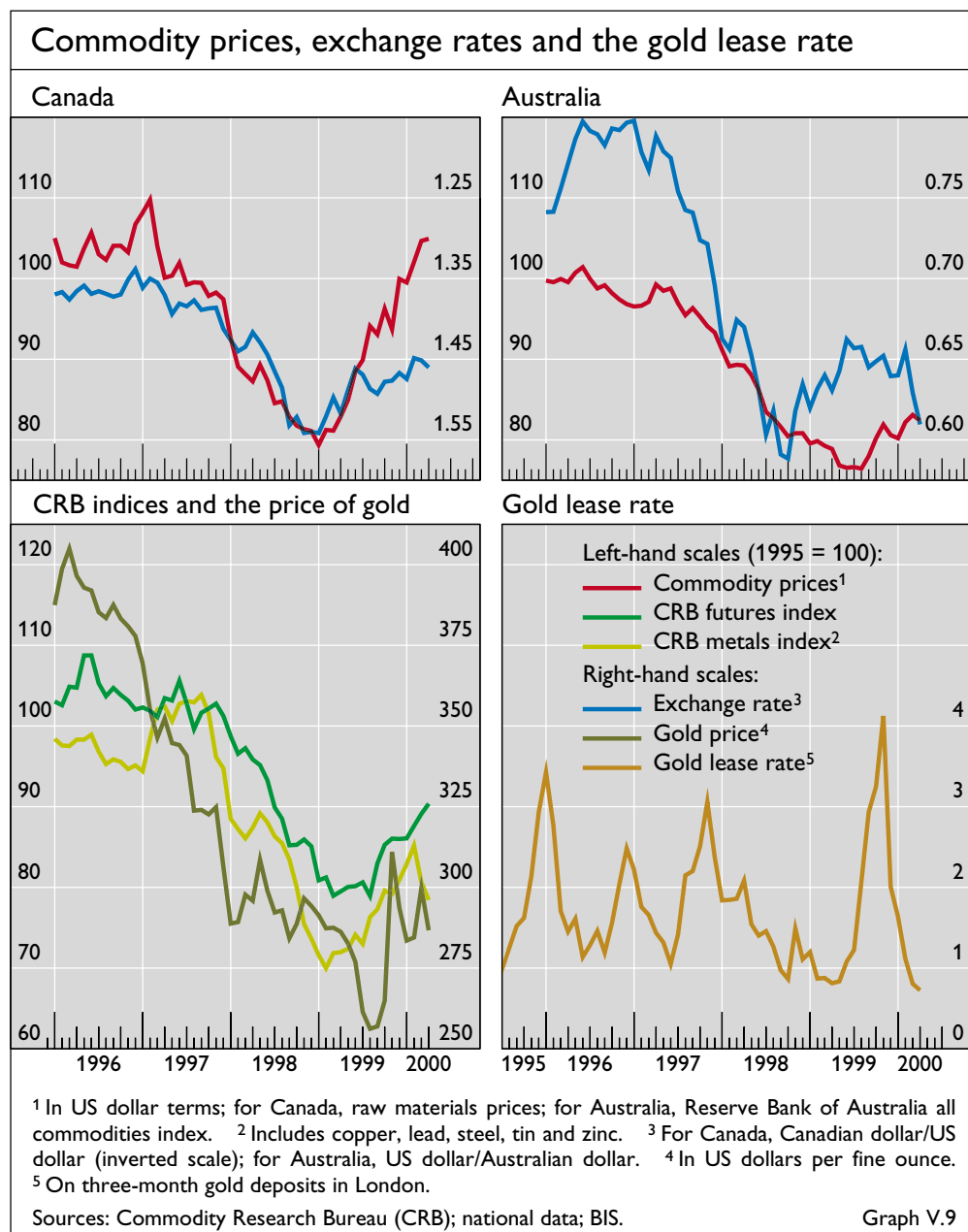


between the Swiss franc and the euro had reduced profit opportunities in this market. In late March 2000, however, the Swiss authorities tightened monetary policy much more than did the ECB and in the weeks that followed the Swiss franc gained 2.5% against the euro.

Currencies of other industrial countries

Divergent paths of the Australian and Canadian dollars

Commodity prices have traditionally been regarded as an important determinant of the Canadian dollar and, to an even greater extent, the Australian dollar. Foreign exchange traders outside the two countries are generally believed to associate both currencies with the Commodity Research Bureau (CRB) index, which has risen by 10% since mid-1999. This link appears to have weakened last year. As commodity prices rebounded in the summer after having declined for several years, the Canadian dollar strengthened while the Australian dollar depreciated against the US dollar (Graph V.9). In part this



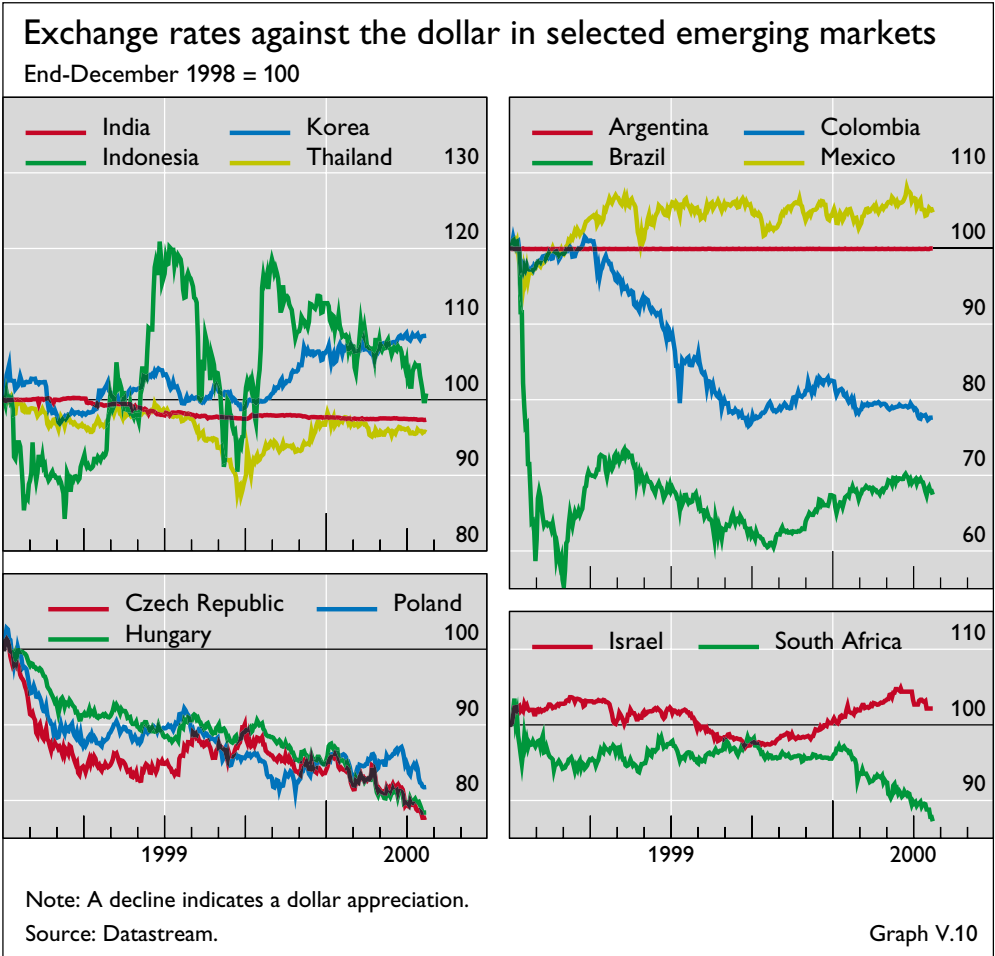
divergence may be explained by traders starting to focus on the different commodity composition of Australian and Canadian exports, as the commodity index that is relevant for Canada rose sooner and much more sharply than the corresponding index for Australia. It may also have reflected expectations of slower growth in Australia, compared to signs of a continuing robust expansion in Canada.

Market commentary attributed the weakness of the Australian foreign exchange and stock markets in the first few months of 2000 to offshore investors' focus on the modest weight of high-tech shares in the local stock market. This would tend to brand Australia as an "old" rather than a "new" economy, in contrast to Canada. However, it is much too early to assess the impact of the high-tech sector on foreign exchange markets. Moreover, while the Australian economy is not heavily involved in high-tech production, the strong growth in productivity in Australia suggests that it is a heavy user of new technology.

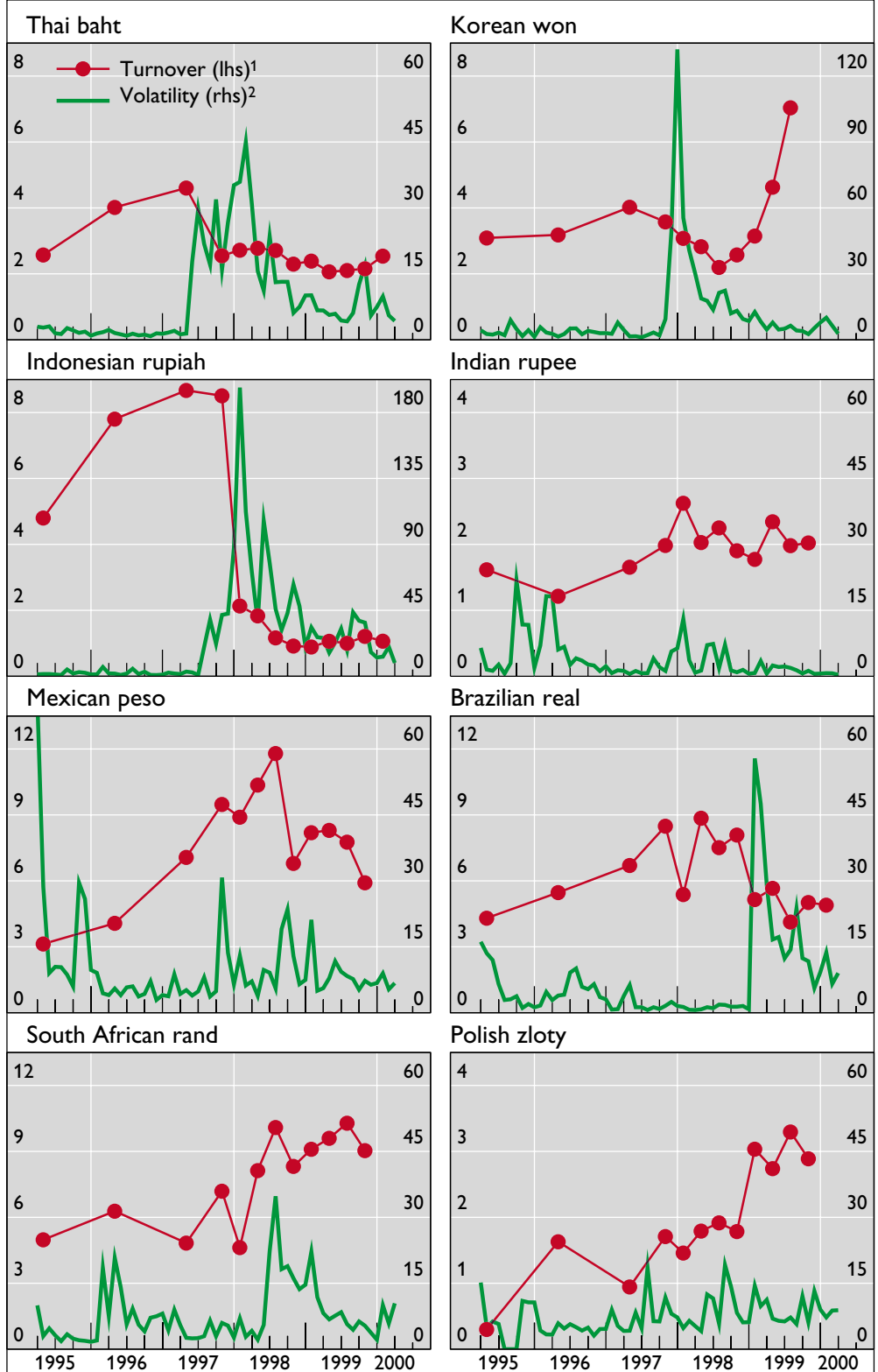
Emerging market currencies

In contrast to recent years, foreign exchange markets in emerging market countries remained fairly calm during the period under review. Most Asian currencies remained broadly stable or strengthened in 1999 and early 2000 (Graph V.10). In the second half of 1999, the won appreciated by about 7%

Markets remained broadly calm



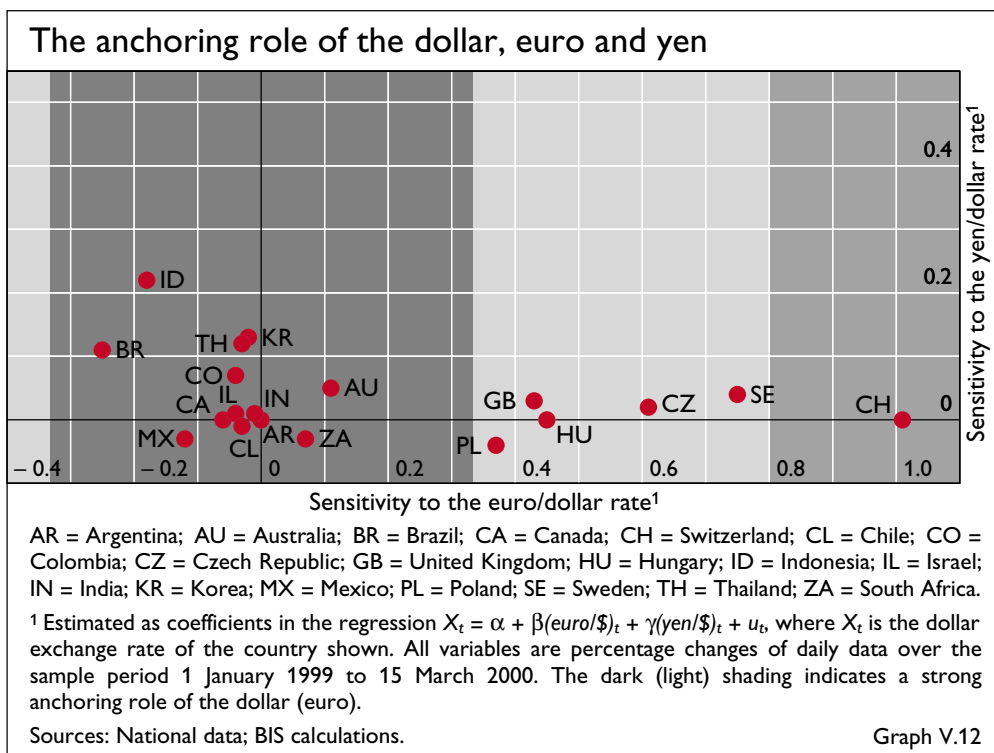
Turnover and volatility in selected emerging markets



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 Mexico, Brazil and South Africa, including other currencies; for Indonesia and Poland, on a gross basis; for Thailand, 1995 second half and 1996 annual averages; for Indonesia, 1995 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.

Graph V.11



against the dollar, while the baht and the rupiah first depreciated but then regained the ground lost. In the months following the speculative attack on the real and its subsequent floating, Latin American markets suffered some pressure, particularly Colombia, where the peso fell markedly between April and July 1999, and Ecuador, where dollarisation was officially introduced in early 2000. Foreign exchange markets in the region were, however, sheltered from major turmoil. Eastern European currencies generally remained stable against the euro and weakened by about 20% against the dollar. Elsewhere, the rand experienced some pressure in early 1999 and again in January 2000 as monetary policy was eased.

The volatility of exchange rate movements in Asian and some Latin American markets generally continued to decline but in some countries remained above values seen before the Asian crisis in 1997 and 1998 (Graph V.11). Local trading volumes were stable or increased, although in many cases they were still far below the levels reached in the mid-1990s. The Korean foreign exchange market was a notable exception: trading activity surged in 1999, accompanying a boom in local equity markets, which received a \$5.2 billion inflow from abroad in 1999 and a further inflow of more than \$6 billion from January to mid-March 2000.

To a large extent, these generally improved conditions reflected domestic factors, such as the recovery in growth. In some Asian countries, substantial current account surpluses combined with capital inflows put upward pressure on the exchange rate, and in certain cases the monetary authorities intervened in the foreign exchange market to stem the appreciation of the domestic currency.

During the period under review, currencies in Asia and Latin America remained heavily influenced by the behaviour of the dollar and tended to

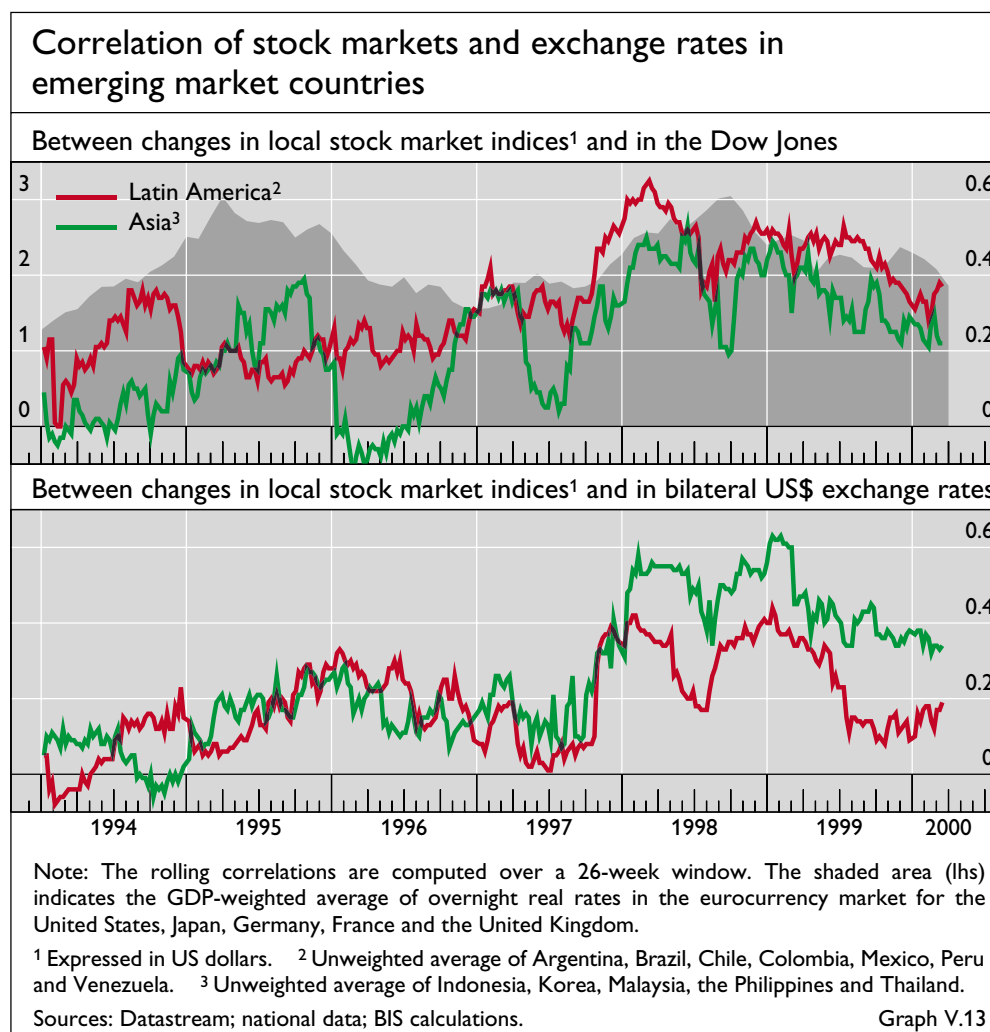
The role of the dollar ...

... and US stock markets

track very closely its movements against the yen and the euro (Graph V.12). In contrast, the yen continued to play a minor role, even in the Asian region, while the euro's influence closely matched that of the mark.

A related factor in the improved performance of emerging market currencies may have been the rally in US stock markets, which appeared to exert an important positive influence on local stock markets. While low interest rates in these countries may have favoured equity purchases by domestic investors, it is also true that local stock markets have moved quite closely with US equity markets over the past few years (Graph V.13). Moreover, changes in local stock markets and in the dollar exchange rate of the domestic currency appear to have been highly correlated over the same period. Given the tight link of emerging market currencies in Asia and Latin America with the dollar, the correlation appears to be explained in part by the broad influence of US monetary policy changes.

Several other external factors also had a positive impact on emerging market currencies in 1999 and early 2000. The rebound of commodity prices in summer 1999 helped the currencies of countries that traditionally rely on commodity exports. More importantly, continued ample liquidity in international financial markets (see the shaded area in Graph V.13) was generally beneficial for emerging markets.



Structural changes and trading activity in foreign exchange markets

The period under review was characterised by subdued overall foreign exchange market activity. Informal estimates by market participants suggest there had been a sizeable decline in turnover in the major centres, which can be traced back to autumn 1998, when activity had fallen sharply in response to the broad financial market turbulence and the associated global decline in liquidity. While short-term developments may have kept trading volumes low, activity may also have been influenced by major structural changes that have affected foreign exchange markets in the last few years. An important question is whether the reduction in trading volumes was also reflected in continuing low levels of liquidity.

Subdued global activity ...

European markets began to shrink several years ahead of the introduction of EMU. Figures from the 1995 and 1998 triennial central bank surveys of foreign exchange and derivatives markets suggest that the approach of EMU had led to a gradual reduction of about 8% of total foreign exchange turnover. In 1999, this reduction was not reversed by any increase in trading in the euro over that in its predecessor currencies. The share of trading in the euro against the dollar in 1999 roughly matched that of the mark, French franc and lira against the dollar in April 1998. Moreover, the euro/yen market appeared to be as small as the mark/yen market in 1998. Commercial banks' desire to compensate for the anticipated loss of revenue from European trading had supported the rapid growth of foreign exchange markets in emerging market countries. However, with the onset of the Asian crisis, activity also declined in these markets, and thus did not offset the reduction in trading in Europe.

... influenced by EMU ...

Apart from leading to the disappearance of intra-European trading, the introduction of the euro also appeared to influence the level of foreign exchange market activity indirectly by spurring the consolidation in the banking sector in continental Europe (see Chapter VII) and the consequent reduction in the number of market players. This influence was compounded by the increase in mergers and acquisitions in the US and UK banking sectors in recent years.

A further reason for lower trading volumes during 1999 may have been an acceleration of the trend towards concentration among brokers in foreign exchange markets. In the course of the year, electronic broking expanded further in the spot market, to the disadvantage of traditional means of dealing such as voice broking or direct dealing. Between 1995 and 1998, the share of electronic broking in spot foreign exchange market activity increased from about 10% to about 15%. The share doubled in the following two years, and in certain market segments, such as those involving the major currencies, electronic brokers reportedly covered between 50 and 80% of the market.

... and the growing role of electronic broking

The advance of electronic broking owes much to its lower costs, higher efficiency and, most importantly, greater transparency compared to traditional means of dealing. Spot foreign exchange markets have traditionally been opaque, given the difficulty of disseminating price information in the absence of centralised exchanges. Before the advent of electronic broking, dealers had typically to enter into a number of transactions to obtain information on prices available in the market. Traders operating through electronic brokers, by

Volatility in the major foreign exchange markets			
	Yen/dollar	Yen/euro ¹	Dollar/euro ¹
Historical volatility ²			
1980–89	10.1	7.3	11.4
1990–98	10.9	10.4	10.3
Implied volatility ³			
1997	11.6	10.9	10.1
1998	16.1	14.9	9.8
1999	14.5	14.4	10.0
2000 Q1	13.6	16.5	13.5
High-low difference ⁴			
1997	6.9
1998	17.7	15.8	0.4
1999	14.3	17.4	2.7
2000 Q1	4.6	16.9	21.5

¹ Prior to 1999, yen/mark and dollar/mark. ² Annualised standard deviations of daily returns computed over calendar months. ³ One-month. ⁴ Frequency of days, in percentages, when the intraday difference between high and low was greater than 2%.

Sources: ECB; Standard & Poor's DRI; BIS calculations. Table V.4

contrast, are able to know instantly the “best” price available in the market and to them, depending on their and their counterparties’ credit limits, without having to go through an uncertain price discovery process. This implies that foreign exchange dealers generally need to enter into a significantly lower number of transactions when they use electronic brokers than with traditional means of trading. The same level of market liquidity might therefore be compatible with lower turnover. A further consequence is that bid-ask spreads on the main exchange rates have fallen dramatically, reaching about two to three hundredths of a US cent.

Some impact on volatility

While the expansion of electronic broking has certainly had a negative impact on trading volumes, it is not at all clear from the available evidence that liquidity suffered given the ease and low cost of altering positions using electronic broking. Nor is the influence on liquidity of the other structural changes described above obvious. In recent years, volatility has risen compared to the average of the last two decades, particularly in the dollar/yen and euro (mark)/yen markets (Table V.4). The dollar’s unprecedented fall by 10% against the yen on two days in early October 1998 shows that the amplitude of intraday changes has at times also been greater. Moreover, there are some indications that the frequency of sharp intraday exchange rate movements, such as the ¥3 drop of the euro within a few hours on 28 February 2000, has increased. However, there is no evidence that the persistence of spikes in volatility changed in 1999. Overall, therefore, it is too early to ascertain whether the patterns of volatility have changed significantly.

Developments in the gold market

The period under review was an eventful one for the gold market. In the first three quarters of 1999, the price of gold trended downwards from about

\$291 per ounce in January to a low of \$254 in late August (Graph V.9). The remainder of the period was characterised by two major events. The first occurred in the two weeks after the joint central bank statement of 26 September 1999, when the gold price rose by about a quarter. In the following weeks, the gold price surrendered part of its gains in a very volatile market. The second took place on 7 February 2000, when it leaped by about \$20 per ounce within a few hours of the decision of a major gold mine to alter its hedging strategies. This change was, however, reversed over the next few days.

Long-term, cyclical and more technical factors weighed on the gold price during the period under review. The global lowering of inflation expectations had reduced gold's attractiveness as a store of value and dampened its price over the preceding decade. In the last few years, the price of gold suffered in addition from the broad decline in commodity prices and depressed demand in the Asian region. The substantial fall in 1999 can also be attributed to a surge in forward sales by gold producers. In order to lock in current prices so as to gain protection against future declines, gold mines stepped up their hedging sales by more than 400% in the first three quarters of the year, an increase equivalent to about 10% of the total annual gold supply. A sharp rise in the gold lease rate in summer 1999 put pressure on banks that would normally buy gold forward from gold producers at long maturities and hedge their exposure by borrowing gold at short maturities and selling it on the spot market. In 1999, gold producers appear to have started to lock in their output prices at longer maturities (10–15 rather than 5–10 years), while banks in response were trying to lengthen the maturity of their gold borrowing beyond three to six months. Although conditions in the gold lease market eased in the autumn, hedging activity also appears to have been behind the temporary rise in volatility in October 1999 and the sharp spike in the gold price on 7 February 2000, when it jumped from \$294 to \$313.

The joint statement on gold, which pushed up the gold price at the end of September 1999, was issued by the central banks of the Eurosystem, the Bank of England, Sveriges Riksbank and the Swiss National Bank, which together hold about half of total official gold reserves (Table V.5). The signatories agreed to limit gold sales to a maximum of about 400 tonnes a year and to 2,000 tonnes over a five-year period. They also stated that gold would remain an important element in official reserves, that only sales that had already been decided could actually be carried out, and that the signatories would not expand their activity in the gold leasing and gold derivatives markets. The central banks' agreement seemed to break the declining trend of the price of gold. After the announcement, the gold price rebounded from about \$260 to more than \$330 in early October. Overall, the gold market has seen a return to calmer conditions since then.

Joint statement supported the price of gold

News about sales of official gold holdings by central banks was also viewed as a factor affecting the price of gold during the period under review. While this argument might be justified on the grounds that such sales alter the balance between the current demand for and supply of gold, these sales were relatively small compared to the size of the gold market. A sale of, say,

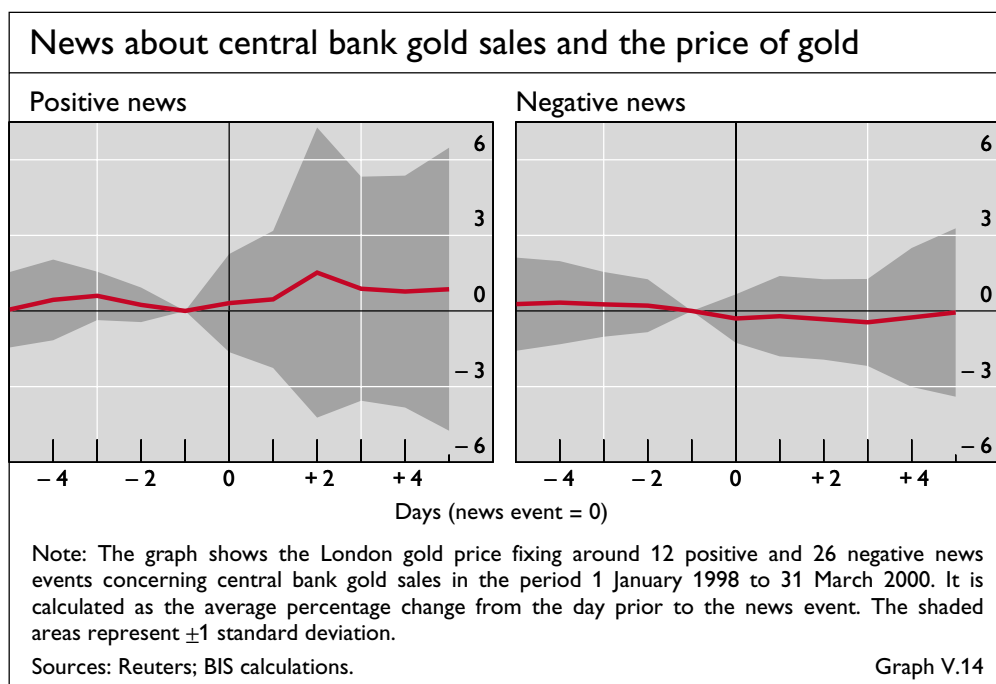
Official gold holdings ¹		
	Tonnes	Share of total (in %)
Signatories ²	15,998	47.6
Germany	3,469	10.3
France	3,024	9.0
Switzerland	2,590	7.7
Italy	2,452	7.3
Netherlands	1,012	3.0
ECB	747	2.2
United Kingdom	665	2.0
Portugal	607	1.8
Spain	523	1.6
Austria	407	1.2
Belgium	258	0.8
Sweden	185	0.6
Finland	49	0.1
Ireland	6	–
Luxembourg	2	–
Others	17,623	52.4
of which:		
United States	8,138	24.2
IMF	3,217	9.6
Japan	754	2.2
BIS	192	0.6
South Africa	124	0.4
Australia	80	0.2

¹ At end-September 1999. ² Signatories to the joint statement on gold of 26 September 1999.
Sources: IMF; World Gold Council; BIS. Table V.5

100 tonnes is equivalent to about 4% of estimated world annual production and represents around 10% of the estimated average daily turnover in the London spot gold market. An alternative explanation for the influence of official gold sales is that, despite their relative size, they provide important signals of future intentions. Central banks are the largest single group of holders together with the IMF, with official gold reserves amounting to about 33,000 tonnes, the equivalent of 13 years' production: hence, should the market start to anticipate future sales, this would probably affect current prices.

Given the impact of the central bank agreement on the gold price, it is instructive to analyse the behaviour of the gold price around all the days on which news about official sales reached the market during the period January 1998–March 2000. While it should be stressed that this analysis focuses on news about official gold sales that reached market participants, rather than actual sales figures, it would be consistent with the signalling argument above that the former is more relevant in determining the market's reaction and hence the gold price. News events can be classified according to whether ex ante they might have a positive or a negative impact on the gold price. Positive news includes decisions to abandon previously planned gold sales and official comments opposing gold sales. Negative news comprises reports of actual official sales or of increased prospects of future sales. Obviously, this

On average, the effect of news about central bank gold sales ...



classification is not incontrovertible. News about a previous sale that is only announced ex post might have a positive effect on the gold price, as the market would be encouraged to learn that a sale had been absorbed.

On average the gold price declined on days marked by the arrival of negative news about gold sales (Graph V.14). However, the decrease was very small (no bigger than 0.25%) and was almost entirely reversed in the days that followed. In the case of positive news, the gold price increased on average, but again only temporarily. It should be noted that this last result appears to have been driven mainly by the central bank agreement of 26 September 1999. When this single item is excluded from the list of positive events, they are on average followed by a small decline in the gold price.

... was not significant

Subject to the caveats mentioned above, this analysis suggests that, over the last two years, while on some occasions news about official gold sales had a substantial impact on the gold price, its average impact was not significant. One interpretation of this apparent puzzle is that, during the period 1998–early 2000, most of this news was backward-looking. That is, it provided market participants with information about sales that had already occurred.