

V. Foreign exchange markets

Highlights

The continued broad depreciation of the US dollar was the most notable development in foreign exchange markets in 2003 and the early months of 2004. The dollar depreciated markedly against the euro and a number of other floating currencies. Its decline was particularly pronounced vis-à-vis the pound sterling and the Australian, Canadian and New Zealand dollars. By contrast, its depreciation against the yen and Asian emerging market currencies was limited. Between February and mid-May 2004, the downward trend in the US dollar partially reversed.

Three main factors appeared to drive exchange rate movements during the period under review. First, market participants focused on the widening US current account deficit and changes in the composition of its financing as a key determinant of the dollar's decline. Second, against the background of ample global liquidity and uncertain trends in stock markets, interest rate differentials continued to be a major determinant of exchange rate movements. The search for yield often took the form of carry trades. Third, unprecedented intervention by the Japanese Ministry of Finance and large reserve accumulation by several central banks elsewhere in Asia limited the dollar's depreciation against Asian currencies. As in previous years, market participants focused on the Chinese monetary authorities' exchange rate policy.

The role of the US external imbalance and that of official reserve accumulation in Asia are examined in more detail in the second half of the chapter. An empirical analysis of the financial flows associated with current account adjustments since the mid-1970s reveals sizeable swings in a number of categories of capital flows during these episodes. Nonetheless, an analysis of the experience in the United States around 1987, in the light of somewhat different conditions today, suggests that the pattern of adjustment of the present US external imbalance cannot be predicted with confidence. This is particularly so given the role currently being played by public sector capital flows. While traditional determinants of official reserve holdings do provide some explanation of the extent of reserve accumulation observed in Asia, there is also some evidence of a change in the motivation behind reserve accumulation during the past two years.

Conditions in foreign exchange markets in the period under review were characterised by an unusually sharp rise in overall activity, driven mainly by speculative players. A notable exception was the yen/dollar market, which appears to have experienced a decline in liquidity.

Exchange rate movements: the facts

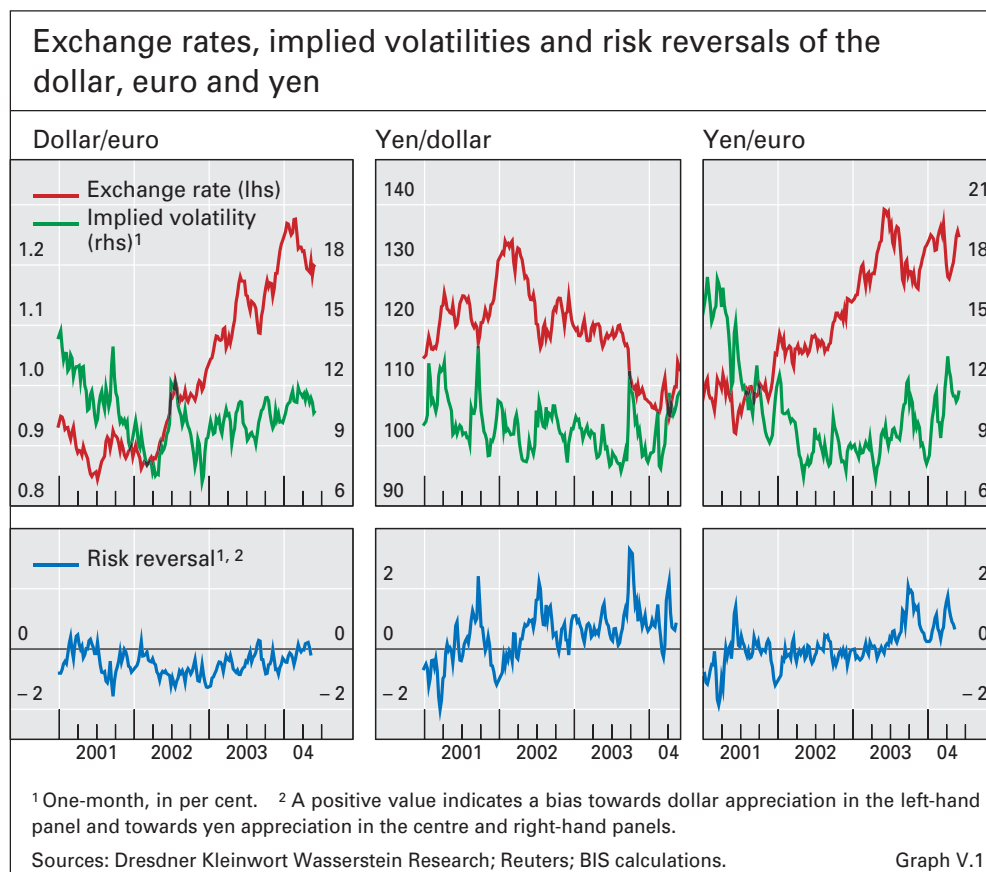
The broad depreciation of the dollar, which had started in January 2002, continued until early 2004, when the US currency began to recover some ground (Graph V.1). Between its peak in January 2002 and its trough in February 2004, the dollar depreciated by 22% in nominal effective terms. During the same period, the euro gained 12%, while the yen appreciated by around 6%. Between mid-February and mid-May, the dollar regained 6%, the euro depreciated by 2% and the yen declined by 4% in nominal effective terms.

Between January 2002 and February 2004, the dollar declined by 43% against the euro, which on 17 February reached the highest value since its inception, at \$1.29. During this period, the dollar also depreciated vis-à-vis other floating currencies, in particular sterling (30%) and the Australian (51%), Canadian (20%) and New Zealand dollars (64%) (Graph V.2). Several emerging market currencies – especially the real, the rand and the Chilean peso – also appreciated substantially against the dollar (Graph V.3). The rise in all these currencies became less uniform around July–August 2003, as market participants reacted to various changes in expected and current policy rates.

Between mid-February and mid-May 2004, the downward trend in the US dollar partially reversed. The trough in the dollar's trend coincided with official remarks pointing to the excess volatility in recent exchange rate movements. Subsequently, the dollar appreciated by about 6% against the euro. Similar

Broad depreciation of the dollar ...

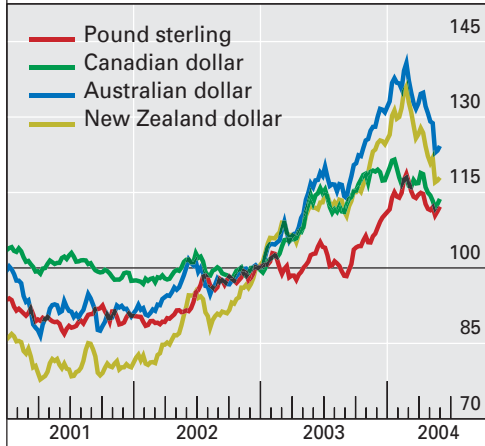
... partially reversed starting in February 2004



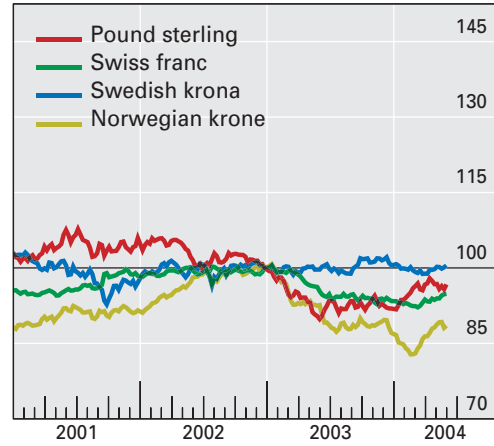
Exchange rates of other industrial countries

Weekly averages, end-2002 = 100

Against the US dollar



Against the euro



Note: An increase indicates an appreciation.

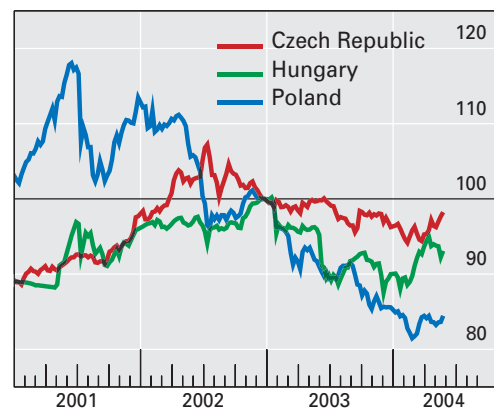
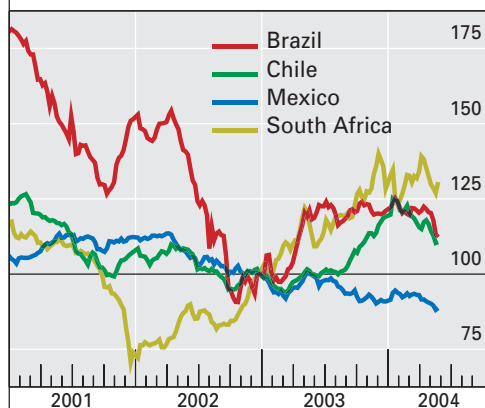
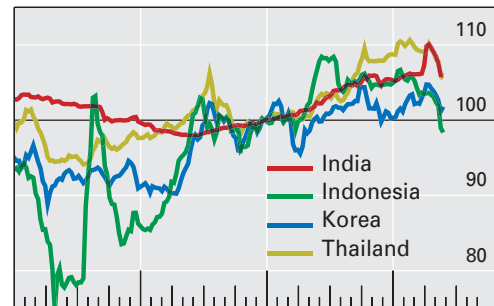
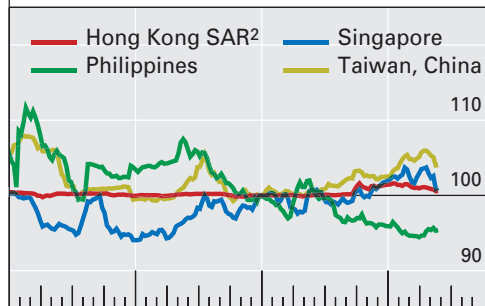
Source: National data.

Graph V.2

downward movements were recorded by the pound (-8%) and the Canadian dollar (-6%), while the Australian and New Zealand dollars depreciated by 14% and 15%, respectively.

Exchange rates in emerging markets¹

Weekly averages, end-2002 = 100



¹ Against the US dollar (in the bottom right-hand panel, against the euro); an increase indicates an appreciation against the dollar (euro). For the bottom left-hand panel, compressed scale. ² Twelve-month forward rate.

Sources: ECB; Bloomberg; Datastream.

Graph V.3

The principal exceptions to the general pattern of strong appreciation against the US dollar until February 2004 were the yen and most Asian emerging market currencies. A number of currencies in Asia are pegged to the US dollar, most notably the renminbi and the Hong Kong dollar, but even amongst those that are not pegged, the appreciation over this period was considerably more muted than, for example, that of the euro or the pound.

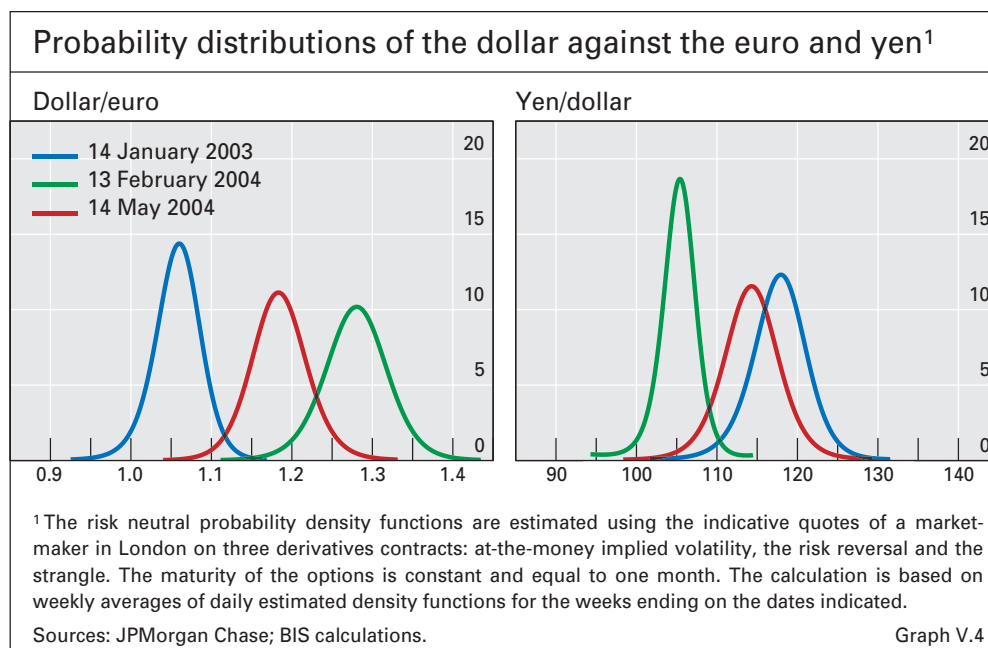
Limited appreciation of Asian currencies against the dollar

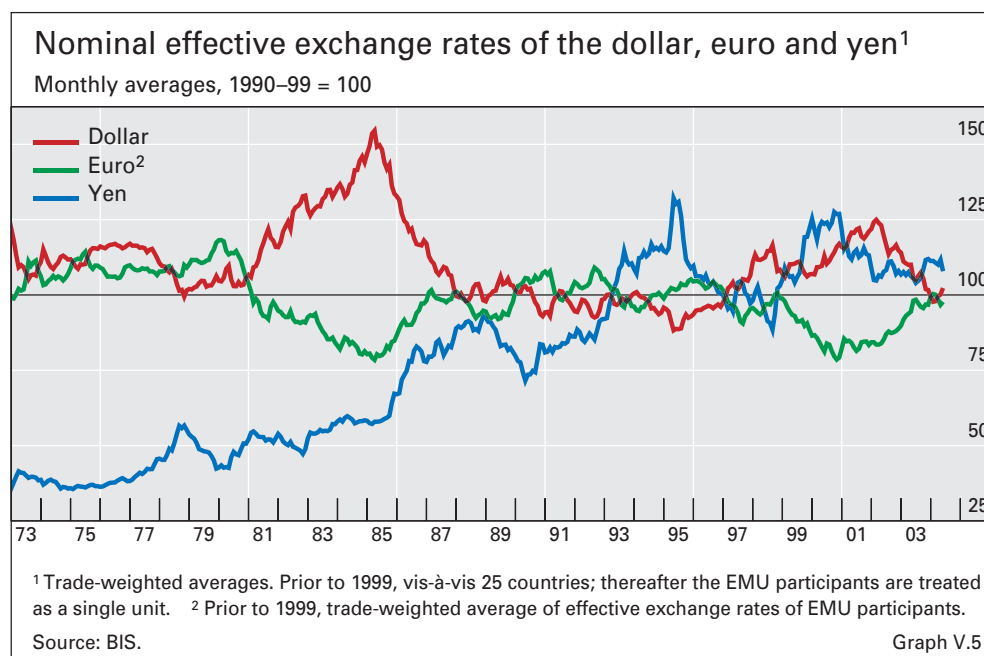
Visible changes in market sentiment accompanied the reversal of the trend of the dollar. During most of 2003, market participants' expectations of the future exchange rate of the currency, measured by the mean of estimated risk neutral probability density functions, continued to decline. Moreover, markets' assessment of the balance of risks between a much stronger and a much weaker dollar, described by the skewness of these density functions, was weighted noticeably towards the latter (Graph V.4). This pattern was particularly pronounced in the dollar/euro market. These expectations started to change in early 2004. Between February and mid-May, option prices suggested that the attitude towards the dollar became less negative. The previous skewness largely disappeared, with the market assigning approximately equal likelihood to a substantial strengthening or weakening of the dollar.

Significant shift in market sentiment

According to market participants, these broad exchange rate movements took place against the background of two noteworthy developments in foreign exchange market conditions. First, the volume of trading generally rose sharply, continuing a trend that had started in early 2001. This was reportedly driven to a large extent by the greater activity of the leveraged investor community. Particularly prominent was the increase in the activity of macro hedge funds, which base their strategies on views about fundamentals such as interest rate differentials, and momentum players, which typically track trends in asset prices. Institutional investors and corporate treasurers were also seen as being much more active. The rise in turnover appeared to be

Two noteworthy changes in market conditions





most pronounced in the dollar/euro market. Liquidity conditions in most foreign exchange markets did not seem to change noticeably over the period, with liquidity generally remaining very high. Second, and in contrast to the other main market segments, traders suggested that the yen/dollar market in 2003 was characterised by both a decline in activity and a lower level of liquidity, as indicated by reduced trading volumes and tighter intraday trading ranges. These changes were seen to be associated with the two-way risk introduced into that market by systematic official intervention.

The longer-term perspective

Despite the large movements in exchange rates over the period, two points are worth noting from a longer-term perspective. First, in nominal effective terms the three main currencies are now very close to their averages for the 1990s (Graph V.5). Second, the dollar's depreciation between January 2002 and February 2004 was much smaller than the major correction in the mid-1980s, when the currency lost around 50% of its value against both the yen and the Deutsche mark, following a period of overshooting in the first half of that decade.

Exchange rate movements: determinants

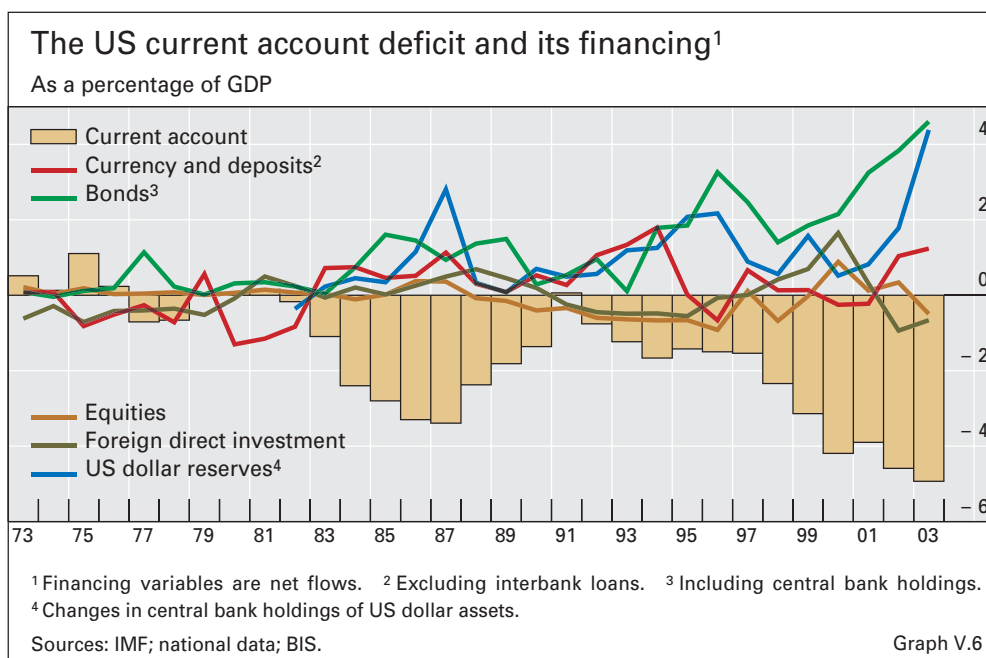
Three main determinants of exchange rate movements

The broad exchange rate movements during the period under review appeared to be driven by three main factors: the external imbalance of the United States, interest rate differentials, and exchange rate policies in Asia.

The US current account deficit

Until February 2004, markets focused on the US current account deficit

As had been the case in 2002, the focus of market participants on the increasing size of the US current account deficit was the main determinant of the dollar's broad depreciation up until February 2004. In 2003, the deficit reached 5% of US GDP (Graph V.6), and US net international liabilities rose to 25% of GDP. Even so, the rising stock of international liabilities did not constitute a significant burden for the United States, as the yields on US international



assets exceeded those paid on the US liabilities. Thus, net income flows continued to be positive.

Arguably the main influence of the US external imbalance on the dollar was through its impact on general market sentiment, in terms of a widespread expectation of the need for a depreciation of the currency. Two related considerations led to this expectation. First, with the US fiscal deficit rising further, the need to finance a large current account deficit appeared likely to persist for longer than previously expected. Moreover, the roots of the external imbalance were increasingly seen to lie in inadequate national saving rather than high levels of productive investment. Second, changes in the composition of financial flows into the United States – a fall in the share of private flows and, within private flows, a decline in the share of equity and foreign direct investment inflows – suggested that the private sector was becoming less willing to finance the US current account deficit (Graph V.6).

A key issue is what form an adjustment of the US external imbalance might take. While some changes in the exchange rate and capital flows have already taken place over the past two years, they have been orderly. An important question is whether these conditions will continue or whether there is a likelihood of a disorderly adjustment of capital flows that might disrupt financial markets. One way to address this question is to analyse the nature of capital flows during historical episodes of current account adjustments (see below).

Interest rate differentials

The second main factor determining exchange rate movements was interest rate differentials. The correlation between exchange rate movements and both prevailing and expected interest rate differentials was evident for a large number of economies (Table V.1). Among the G3 economies, the euro's rise against the dollar and the yen between January 2002 and February 2004 was underpinned by fact that the euro area had the highest interest rates and

Interest rate differentials influenced capital movements and exchange rates

hence attracted yield-driven capital (Graph V.7). Relatively high and rising interest rates in the United Kingdom contributed to the appreciation of sterling against the dollar and the yen.

The impact of interest rate differentials was felt most conspicuously in the markets for the Australian, New Zealand and, to a lesser extent, Canadian dollars (Graph V.2), which traditionally are also influenced by commodity prices. Until early 2004, the three currencies rose markedly against the US dollar. However, the appreciation of the Australian and New Zealand dollars vis-à-vis the euro was limited, notwithstanding favourable interest rate differentials and a 39% increase in commodity prices. The Canadian dollar even depreciated against the euro in spite of similar yields and the positive influence of commodity prices.

The global search for yield and interest rate differentials also played a prominent role for a number of emerging market currencies. In a context of cheap funding, as suggested by low short-term rates (see Chapter IV), and a high tolerance for risk, as indicated by narrow credit spreads and strong bond issuance in emerging market countries (see Chapter VI), the currencies of emerging market countries with a positive interest rate differential tended to appreciate against the dollar. Noteworthy examples were the Chilean peso, which rose by around 9% between early 2002 and early 2004, the rand, which gained some 44%, and the real, which appreciated in spite of some negative domestic developments.

As in the previous year, carry trades were a popular mechanism facilitating investors' search for yield. These trades involve borrowing in a low-yielding currency and investing in a high-yielding one. Over the period, such strategies were followed not only by macro hedge funds and CTAs (commodity trading advisers), but also by institutional investors and non-financial corporates. Reportedly, the three main funding currencies were the US dollar, the yen and

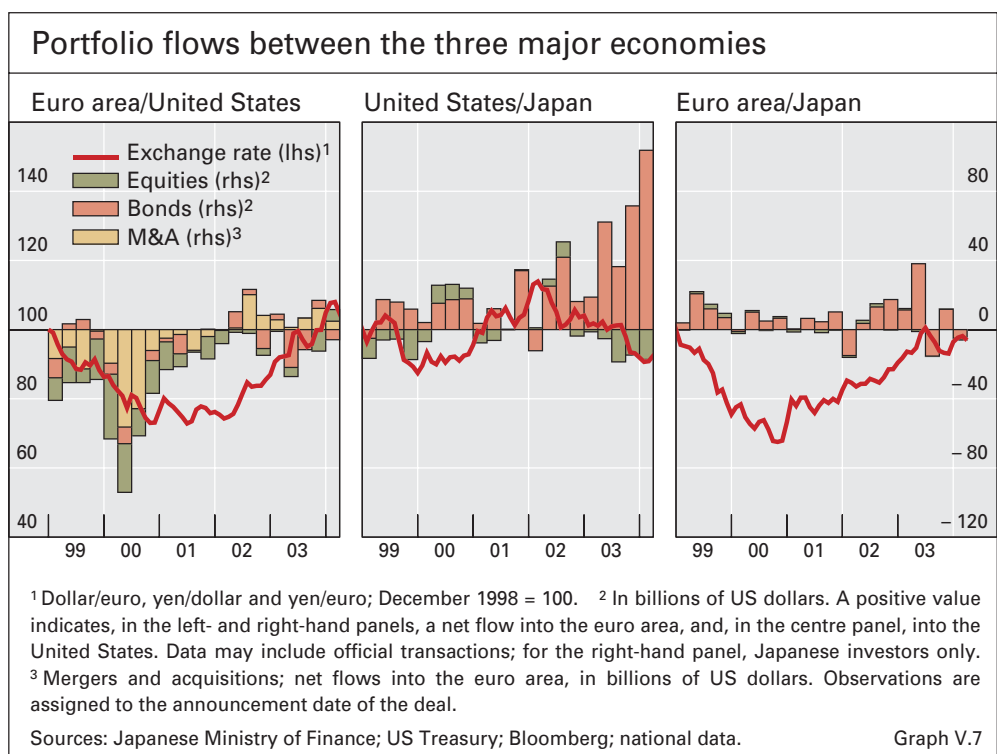
Carry trades were a popular investment strategy

Exchange rates and interest rate differentials								
	Dollar ¹		Euro ¹		Interest rate differential against US rates ²		Interest rate differential against euro area rates ²	
	Jan 02–mid-Feb 04	Mid-Feb 04–mid-May 04	Jan 02–mid-Feb 04	Mid-Feb 04–mid-May 04	Jan 02–mid-Feb 04	Mid-Feb 04–mid-May 04	Jan 02–mid-Feb 04	Mid-Feb 04–mid-May 04
New Zealand	-51.9	15.9	-14.4	8.9	4.2	4.6	2.8	3.6
Australia	-43.6	14.4	-5.9	7.5	3.5	4.5	2.1	3.5
Sweden	-37.8	6.9	-0.8	0.0	2.3	1.3	0.9	0.3
Euro area	-36.7	6.9	.	.	1.4	1.0	.	.
Switzerland	-30.5	4.4	6.1	-2.5	-0.7	-0.8	-2.1	-1.8
United Kingdom	-26.8	7.6	10.8	0.8	2.5	3.2	1.1	2.2
Norway	-26.6	1.0	10.4	-5.9	3.9	0.9	2.5	-0.1
Japan	-20.6	7.6	17.2	0.9	-1.4	-1.0	-2.8	-2.0
Canada	-19.0	5.4	19.1	-1.3	1.4	1.1	-0.0	0.1

¹ Cumulative changes, in per cent; a positive value indicates a depreciation against the dollar (euro). ² Using three-month interest rates.

Source: National data.

Table V.1



the Swiss franc. The main recipients of the borrowed funds included sterling, the Australian, Canadian and New Zealand dollars, and a number of emerging market currencies.

When the generalised upward trend against the US dollar moderated in early 2004 and subsequently partially reversed, the influence of interest rate differentials became more complex. As the market reassessed the probability of policy rate changes in a number of countries, the importance of prevailing interest rate differentials as a determinant of exchange rate changes diminished, while that of expectations of future differentials increased (see Chapter IV). The euro declined noticeably from its peak level in February 2004, as market participants brought forward their assessment of the timing of a rise in US rates in response to strong employment and inflation data in the United States, and began to attach a higher probability to an easing in euro area interest rates. Moreover, by increasing the expected funding cost in US dollars, the revised expectations for the timing of changes in US monetary policy markedly reduced the attractiveness of carry trades involving the Australian and New Zealand dollars. This contributed to a notable depreciation of these currencies against the US dollar. The Canadian dollar, Norwegian krone and Swedish krona also experienced declines as policy interest rates in those countries were lowered and market participants came to expect still further monetary easing. This made the rollover of carry trade positions less profitable. The Swiss franc appreciated vis-à-vis the euro as traders came to anticipate a rise in Swiss rates and carry trades that used the Swiss franc as a funding currency started to be unwound. The movement of the US dollar against the yen, however, was less pronounced, given the continued signs of recovery in the Japanese economy (see Chapter II).

Change in trend in early 2004 as expectations of monetary policy shifted

Exchange rate policies in Asia

Exchange rate policies played a key role in Asia

A third significant factor influencing exchange rates was a high volume of intervention relative to past standards, especially in Asia (Table V.2). These activities helped to alleviate upward pressure on the currencies in the region, raising broader questions about their impact on the adjustment of global current account imbalances (see below). Because of their absolute size, intervention policies in Japan and China came under the spotlight.

Large-scale foreign exchange market intervention in Japan

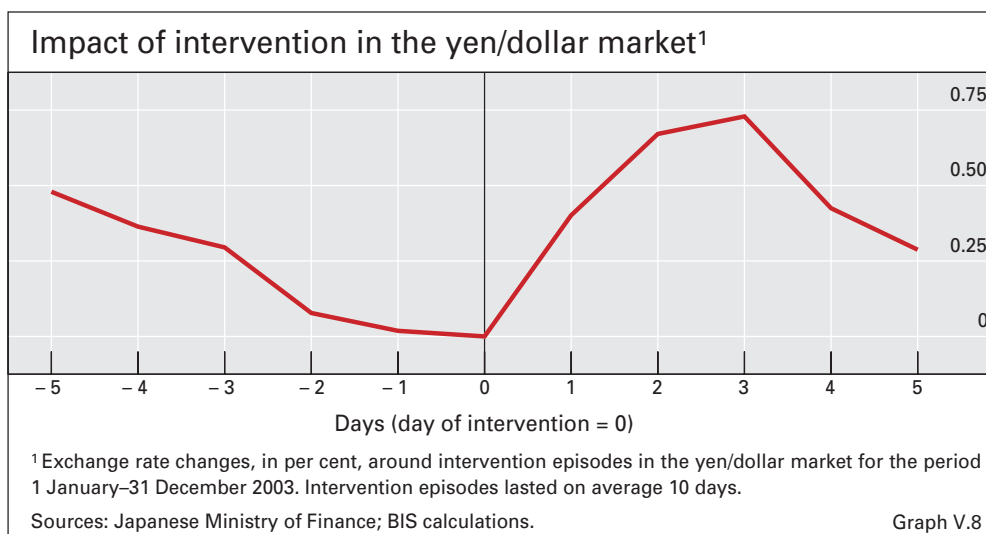
In Japan, the Ministry of Finance purchased \$316 billion worth of US assets between January 2003 and March 2004, a large multiple of the amounts spent on foreign assets in previous years. Moreover, Ministry of Finance data show that the Japanese authorities entered the market more frequently

Annual changes in official foreign exchange reserves							
In billions of US dollars							
	1998	1999	2000	2001	2002	2003	<i>Memo: Amounts outstanding at end-2003</i>
	At current exchange rates						
Total	27.2	138.0	155.0	112.3	351.9	616.6	3,010.9
Industrial countries	-32.8	52.1	54.7	3.0	108.0	215.8	1,103.6
United States	5.2	-3.8	-0.9	-2.3	4.8	5.9	39.7
Euro area	-32.9	-39.2	-9.4	-10.7	7.9	-27.8	188.0
Japan	-4.7	74.5	69.5	40.5	63.7	201.3	652.8
Asia	62.8	79.0	52.5	76.0	173.8	263.9	1,208.1
China	5.1	9.7	10.9	46.6	74.2	116.8	403.3
Hong Kong SAR	-3.2	6.6	11.3	3.6	0.7	6.7	118.6
India	2.6	5.0	5.3	8.0	21.7	30.6	97.6
Indonesia	6.3	3.8	2.0	-1.2	3.7	4.0	34.7
Korea	32.3	21.7	22.2	6.6	18.3	33.7	154.5
Malaysia	4.7	4.9	-1.0	1.0	3.7	10.2	43.5
Philippines	2.0	4.0	-0.2	0.4	-0.3	0.3	13.3
Singapore	3.5	1.9	3.4	-4.8	6.5	13.6	95.0
Taiwan, China	6.8	15.9	0.5	15.5	39.4	45.0	206.6
Thailand	2.7	5.4	-1.9	0.4	5.7	2.9	41.0
Latin America ¹	-9.8	-8.8	2.1	-0.3	4.2	30.6	170.7
Argentina	2.3	1.6	-1.7	-9.9	-4.1	2.7	13.1
Brazil	-8.2	-7.8	-2.3	3.2	1.7	11.7	49.1
Chile	-2.0	-1.1	0.5	-0.6	0.8	0.4	15.2
Mexico	3.3	-0.5	4.2	9.2	5.5	7.8	57.7
CEE ²	6.6	1.7	19.1	12.7	36.3	51.3	197.4
	At constant exchange rates ³						
Total	24.6	178.7	191.4	146.7	258.3	502.8	3,029.8
Dollar reserves	49.0	145.8	50.9	82.9	184.5	441.3	2,092.7
Non-dollar reserves	-24.4	32.9	140.5	63.8	73.8	61.5	937.1

¹ Countries shown plus Colombia, Peru and Venezuela. ² Central and eastern Europe: Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Russia, Slovakia and Slovenia. ³ Partly estimated; valued at end-of-period exchange rates.

Sources: IMF; national data; BIS estimates.

Table V.2

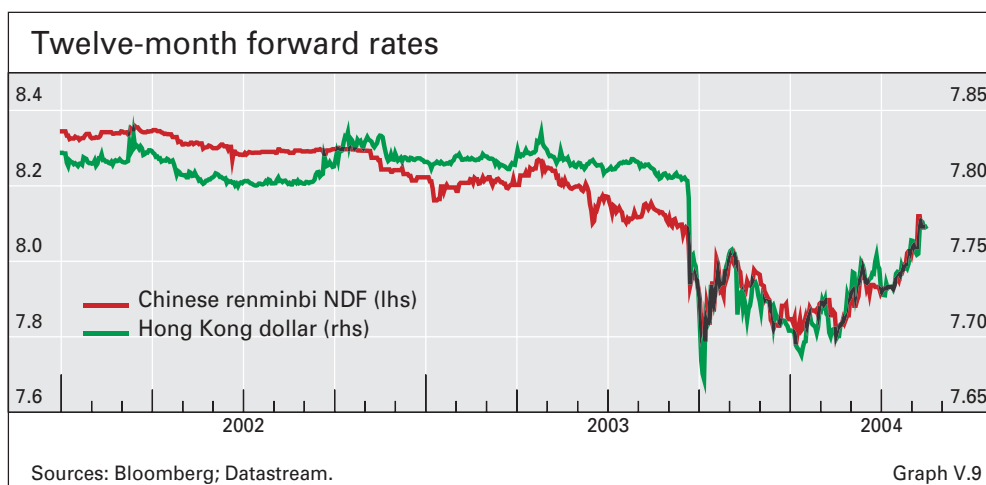


and for longer periods than in the past. Bouts of foreign exchange market intervention were followed by a noticeable reaction of the yen, suggesting that the intervention was effective, at least in the short term (Graph V.8). This outcome may have been related to a perception among market participants of a change in strategy by the Japanese authorities, which were seen to be using substantial intervention to introduce a sense of two-way risk in the market.

In China, the monetary authorities accumulated a sizeable amount of dollar reserves while seeking to preserve the fixed exchange rate vis-à-vis the dollar. Even as the peg was maintained, bouts of upward pressure were evident in the non-deliverable forward (NDF) market (Graph V.9), which provided an indication of the market’s assessment of the likelihood of a change in the central bank’s exchange rate policy. At times, the Hong Kong dollar came under similar pressure, and it experienced a short period of unusual volatility in the spot market in December 2003.

Chinese monetary authorities in the spotlight

In India, Korea and Taiwan, China, dollar reserves also rose substantially as the authorities intervened heavily to limit the appreciation of their currencies against the US dollar and, thereby, the renminbi.



The financing of external imbalances and the role of foreign reserves

During the period under review, changes in the composition of private flows into the United States and a further increase in the share of official flows suggested a decline in private investors' willingness to finance the US current account deficit. This raises two questions. First, do changes in the pattern of private financial flows and the split between private and official flows help predict the start of a current account adjustment? Second, how do capital flows behave once the current account deficit starts to adjust? In particular, what is the likelihood of disorderly changes in capital flows, which might have a disruptive impact on financial markets? These two questions are addressed by examining the patterns of private financial flows and the share of official flows during 28 historical episodes of significant current account adjustments.

The financing of current account deficits in industrial countries since 1973

The 28 episodes of substantial and lasting current account adjustments in industrial countries that have occurred since 1973 (Table V.3) were characterised by two main features. First, on average, a country's current account deficit tended to be reversed when it approached levels around 4–5% of GDP. Second, the adjustment process was generally associated with both a depreciation of the domestic currency and a marked slowdown of growth. The mechanism through which the US current account deficit was reversed in the latter half of the 1980s broadly followed this pattern.

An analysis of the patterns of financial flows suggests that they do not have much predictive power for the timing or the characteristics of current account adjustments. This is evident from an inspection of the averages of

Historical episodes of current account adjustments

Little evidence of systematic changes in trend of financial flows *before* ...

Financial flows and current account adjustments	
	Percentage of episodes in which the financing flow changed in line with the current account adjustment
Non-residents' holdings of domestic debt instruments	89
Loans by non-residents to residents	78
Non-residents' holdings of domestic currency and deposits	58
Residents' holdings of foreign currency and deposits	70
Inward foreign direct investment	36
Outward foreign direct investment	35
Reserve assets	68

Note: A current account adjustment is defined by three conditions: (i) the current account deficit should exceed 2% of GDP prior to the adjustment; (ii) the average deficit should decline by at least 2% of GDP over three years and be reduced by at least a third; (iii) the largest deficit during the five years after the peak should not be wider than the smallest deficit during the three years before the peak. The table covers 28 episodes of current account adjustments observed over the period 1974–2002, comprising: Australia (1989, 1999); Austria (1977, 1980); Belgium (1981); Canada (1981, 1993); Denmark (1986); Finland (1991); France (1982); Greece (1985); Ireland (1981); Italy (1974, 1981, 1992); New Zealand (1984); Norway (1977, 1986); Portugal (1981, 2000); Spain (1976, 1981, 1991); Sweden (1980, 1992); United Kingdom (1974, 1989); United States (1987).

Sources: IMF, *Balance of Payments Statistics*; BIS estimates.

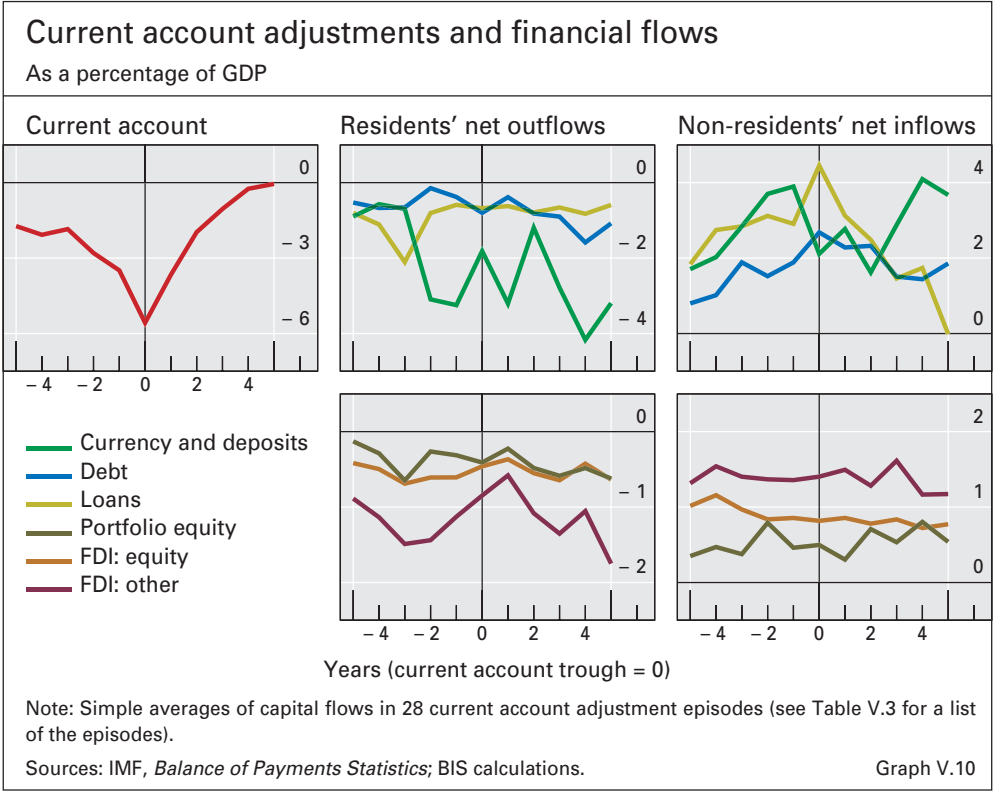
Table V.3

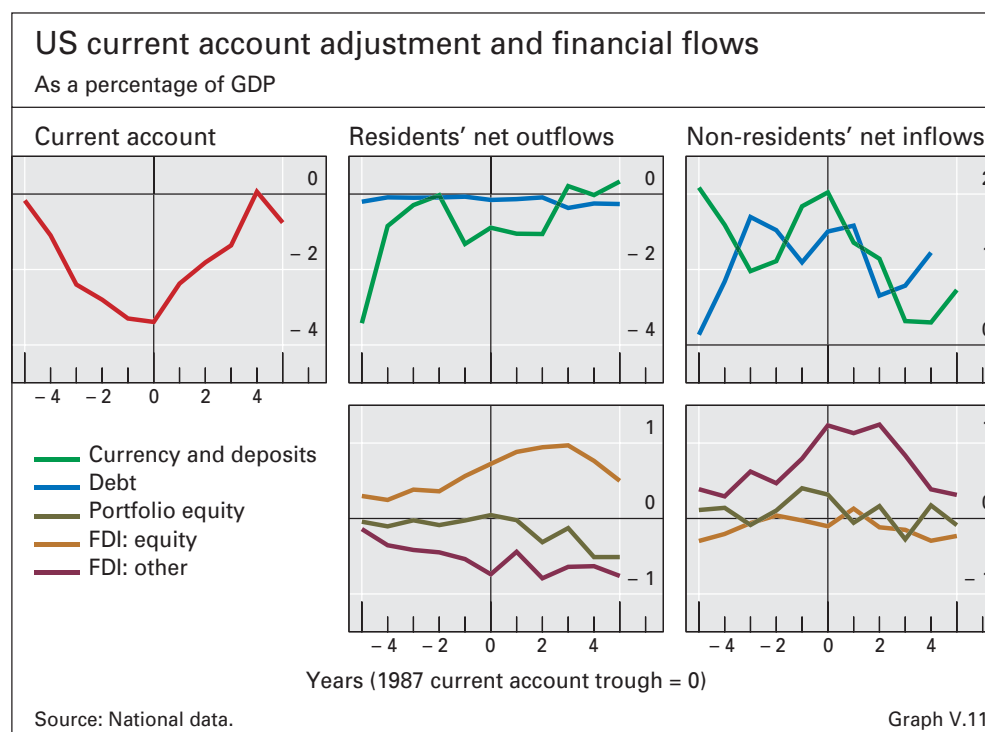
each category of financial flows across the 28 episodes during the five years before the current account trough (Graph V.10). While the behaviour of some types of financial flow changed on average during this window, there is little evidence of a systematic change in trend just prior to the beginning of the period in which the current account adjustment takes place, including for official flows. The only exception is non-residents' holdings of currency and deposits, which typically peaked one year prior to the start of the current account adjustment. Based on this evidence, the changes in the composition of financial flows to the United States observed during the past year might therefore not contain much information about the timing of the adjustment in the US current account.

By contrast, in terms of changes in the pattern of capital flows that coincide with the adjustment of the current account deficit, the 28 historical episodes share several interesting common features. First, the more volatile types of flows, which tend to be primarily influenced by interest rate differentials, generally adjusted the most. More specifically, after rising as the current account deficit grew, holdings of currency and deposits and debt typically declined markedly during the correction (Table V.3). While the more stable foreign direct investment (FDI) flows – both outflows and inflows – exhibited a similar pattern, these changes were less sizeable. For their part, portfolio equity flows, which are commonly perceived as volatile, on average did not change noticeably.

... but some *during* the reversals

Second, the adjustment was driven to an important degree by the behaviour of non-residents. Foreign holdings of domestic deposits, foreign holdings of domestic debt and loans by foreigners to domestic residents changed markedly during the current account adjustments. These categories





of flows generally rose before the turning point of the deficit and tended to fall afterwards. By contrast, only one category of financial flows originated by residents (domestic holdings of foreign deposits) changed systematically during these episodes.

Third, the changes in current account financing were largely in private flows. Holdings of reserves by the home country also tended to change, primarily as a result of intervention in the foreign exchange market in support of the domestic currency and/or valuation effects. But importantly, for all countries that experienced substantial current account adjustments except the United States, purchases of domestic assets by foreign public sector entities were not sizeable and hence did not play a significant role in these adjustments.

Finally, in most cases the changes in the composition of financial flows described above were orderly. One notable exception was the current account adjustment in Sweden in 1992. It was accompanied by a sharp withdrawal of currency and deposits by foreign residents, in the order of 10% of GDP, and an equally sharp fall in foreign loans.

The behaviour of private financial flows during the reversal of the US current account deficit in the mid-1980s was consistent in several respects with the patterns observed in the adjustment episodes for other countries (Graph V.11). First, the two categories of financial flows that changed more visibly around 1987 were holdings of foreign deposits (by both residents and non-residents) and non-residents' holdings of US debt. These types of flows tended to rise before 1987 and fall in the following three years. Second, FDI by non-residents also contributed to the adjustment. Finally, the changes in private flows were orderly. The declines in inflows were smooth, and for each category of financial flows, the cumulative changes between 1987 and 1990 did not exceed 2% of US GDP.

Similarities
between the United
States and other
countries ...

That said, there is one important difference between the United States and other industrial countries. Since the dollar is the main international reserve currency, dollar assets account for a substantial fraction of foreign exchange assets in other countries' portfolios. In contrast to all other countries that experienced current account adjustments, both during the reversal of the US external imbalance in 1987 and in the current situation, purchases of dollar assets (particularly bonds) by foreign public sector entities financed a sizeable share of the US deficit build-up (Graph V.6). In both cases, official dollar reserves initially increased noticeably as the dollar declined under the weight of the widening deficit. In the 1987 case, the accumulation of official reserves subsequently reversed as the US current account narrowed and the need for external financing fell. Based on this historical precedent, the sharp increase in dollar reserves in the past two years could raise the question of whether the recent US current account deficit might be close to a correction.

... but the role of official reserves a key difference

Nevertheless, in terms of official financial flows, the current experience in the United States differs significantly from that of the 1980s. In the mid-1980s the dollar started to fall following a period of overshooting. In 1986 and 1987, the G7 monetary authorities engaged in a concerted effort to halt its rapid depreciation, culminating in the Louvre Accord of February 1987. As a result, dollar reserves were accumulated mostly by Japan, Germany and other industrial countries whose currencies floated against the dollar. Coordinated intervention ceased as the dollar stabilised at much lower levels. Over the past two years, by contrast, the accumulation of reserves has been the result of unilateral interventions by authorities in Japan and emerging market countries in Asia, which put a floor under the dollar's decline, thereby limiting the adjustment of the US current account. Their exchange rate policies have not been coordinated but rather interdependent.

Exchange rate policies very different now from the mid-1980s

The role of foreign reserves

To gain a better understanding of this kind of intervention, it is useful to focus on the role of foreign exchange reserves. What is the rationale for holding reserves and what explains the current behaviour? To what extent has the reserve accumulation been a target in itself, or a by-product of the pursuit of internal or external balance? What are the implications for the sustainability of the financing of the US current account deficit? The implications for the domestic financial system of building up large reserve holdings are discussed in Chapter III.

In a fixed exchange rate regime, be it official or de facto, foreign reserves play a central role. They are used by the monetary authorities to maintain the fixed exchange rate of the home currency in the face of devaluation pressures arising, for example, from capital outflows. In a symmetric fashion, the central bank accumulates reserves to stem upward pressure on its currency. In the absence of capital controls and interest rate adjustments, the amount of reserves accumulated is therefore determined by the monetary authorities' efforts to maintain the exchange rate peg. In the face of persistent capital inflows or outflows, the interest rate could also be used as an instrument.

In a fixed exchange rate regime, reserves play a central role

In a floating regime, reserves can be a target ...

In a floating exchange rate regime the role of reserves is much less clearly defined and it is useful to distinguish two cases. In the first case, monetary authorities may target a specific level of foreign reserves to achieve several objectives. One primary objective is to have sufficient reserves to permit intervention aimed at preserving liquidity in the foreign exchange market. This reduces undesired volatility while allowing the smooth adjustment of the exchange rate. Another possible objective is to create a “war chest” that can boost the creditworthiness of a country in international financial markets and thereby help lessen the risk of destabilising capital flows. The greater the risk of capital flight by domestic residents or non-resident withdrawal, the greater the need for a cushion of reserves.

... or a by-product of intervention for either external or internal goals

In the second case, reserves are accumulated as a by-product of intervention to stabilise the exchange rate, analogously to what happens in a fixed exchange rate regime. In this case, intervention could be directed at external or internal goals. The most common external goal is to resist appreciation in order to maintain the competitiveness of the domestic export and import-competing sectors; a depreciating trend would generally not be opposed on these grounds. In terms of internal goals, central banks might counter upward pressure on their domestic currency to prevent an excessively disinflationary impact, for example within an inflation targeting framework. Intervention could also be used to stabilise the exchange rate to prevent adverse consequences for domestic balance sheets.

Criteria to assess reserve levels

For countries that wish to hold reserves in their own right, different criteria have been used to assess the appropriate level. Traditionally, import cover has been used as a benchmark; that is, reserves should be some multiple of the value of imports. This criterion is more relevant in mitigating liquidity problems during current account crises. However, since the Asian crisis, criteria for the appropriate level of reserve holdings have tended to focus on the capital account. More emphasis has been placed on the cover for capital account flows that may be quickly reversed in a time of crisis, such as short-term external debt, where there is a risk that foreign creditors could stop rolling over maturing credits. An alternative criterion that is relevant for responding to capital account vulnerability is reserve holdings relative to broad money, which captures the risk of holders of domestic liquidity switching into foreign currency.

Some evidence on the different motivations for holding reserves

It is generally difficult to pin down the optimal level of foreign reserves empirically. However, an inspection of the rate of reserve accumulation and exchange rate volatility over the past five years, and of the different criteria used to assess the appropriate level of reserves, can shed some light on the relative importance of the various motivations for the continued Asian intervention.

Change in trend in reserves and exchange rate volatility in 2002

Based on recent trends of reserve accumulation and exchange rate volatility, it is possible to identify two periods with differing characteristics since the Asian crisis. In the immediate aftermath of the crisis (1998–2001), as the dollar was appreciating against the main floating currencies, exchange rates in most Asian emerging market countries were no less volatile vis-à-vis the dollar and in nominal effective terms than those of the main floating

Exchange rate volatility and changes in reserves						
	January 1988–December 2001			January 2002–February 2004		
	Exchange rate volatility ¹		Change in reserves ²	Exchange rate volatility ¹		Change in reserves ²
	Bilateral	Nominal effective		Bilateral	Nominal effective	
Australia	9.6	8.2	0.4	7.3	5.7	12.7
Canada	4.3	4.3	12.5	6.1	5.3	1.5
Euro area	8.5	5.8	–85.9	8.0	4.1	–31.7
Japan	10.8	9.9	179.0	7.4	5.3	369.9
New Zealand	9.9	7.2	–1.7	8.1	6.2	2.5
Norway	6.6	3.2	–8.1	9.8	5.9	8.8
Sweden	7.6	4.4	3.3	7.9	3.5	6.3
Switzerland	8.8	3.4	–2.4	8.3	2.7	17.8
United Kingdom	5.5	4.6	4.9	6.5	4.2	5.1
China	0.0	2.7	71.7	0.0	2.5	209.2
Hong Kong SAR	0.1	4.7	13.1	0.5	4.5	12.2
India	2.9	4.9	20.8	1.6	4.7	57.5
Indonesia	47.4	46.3	9.4	7.2	7.2	7.7
Korea	11.7	13.3	79.7	6.5	5.2	58.2
Malaysia	11.7	10.7	10.7	0.0	3.6	17.8
Philippines	10.3	10.5	6.3	4.1	4.8	–1.4
Singapore	6.6	5.1	7.1	3.1	2.7	25.4
Taiwan, China	5.4	4.9	38.2	3.1	3.3	101.2
Thailand	14.9	14.0	7.0	4.2	2.8	8.7

¹ Calculated as the standard deviation of annualised daily percentage changes in the exchange rate over the period. ² Cumulative change over the period, in billions of US dollars.

Sources: IMF, *International Financial Statistics*; national data; BIS.

Table V.4

currencies (Table V.4). During this period, Asian central banks arguably took advantage of favourable market conditions to rebuild their stocks of foreign reserves from the low levels they had reached during the crisis. Hence, to a large extent the accumulation of reserves appeared to be a target per se.

In contrast, over the past two years, as the trend in the US dollar has changed from one of appreciation to one of depreciation, exchange rate volatility vis-à-vis the dollar has fallen markedly in emerging Asian economies, and is now noticeably lower than that of other floating currencies. Nominal effective exchange rates have also tended to decline. In parallel, reserve accumulation has risen significantly. Closer examination indicates that all three of the reasons suggested above for reserve accumulation may now be playing a complementary role.

The criteria used to assess the appropriate level of reserves provide mixed evidence on a possible change in the nature of reserve accumulation during the past two years. In terms of import cover, reserve holdings in most Asian countries have not increased substantially over the past two years (Table V.5). By contrast, during the same period, reserve holdings as a fraction of domestic liquidity have grown by 40% or more in a number of countries. Moreover, in the majority of emerging market countries in Asia, reserves have risen appreciably relative to short-term external debt.

Mixed evidence concerning large levels of reserves

Intervention consistent with both external and internal balance

The change observed around 2002 in the pattern of exchange rate volatility and reserves relative to GDP, as well as to domestic liquidity and short-term debt, is also consistent with reserve accumulation being the by-product of intervention efforts aimed at external goals. The declining volatility of the currencies of China's neighbours could be partly explained by a desire to resist upward pressure vis-à-vis the renminbi in order to maintain export competitiveness, which has also implied stability with respect to the dollar.

At the same time, over the past two years, foreign exchange intervention by monetary authorities in Asia has in most cases not been inconsistent with monetary policy objectives of internal balance. In the majority of countries targeting inflation, actual inflation has remained within the target bands or close to the targeted level. In Japan, reserves have been accumulated largely as a by-product of the strategy to counter deflationary pressures. In China, while not necessarily inconsistent with monetary policy objectives, reserve accumulation has reflected concerns about the resilience of the domestic financial system if a more flexible exchange rate regime were adopted.

Three alternative scenarios

Looking ahead, Asian central banks might continue to resist upward pressure on their currencies and, in such circumstances, the resulting accumulation of dollar reserves would provide a significant source of financing for the US external imbalance. The risk, though, is that this source of capital flow could diminish. This might occur under a number of alternative scenarios.

Foreign exchange reserves and measures of adequacy									
	Reserves/imports ¹			Reserves/broad money ²			Reserves/short-term debt ³		
	1996	1998–2001 ⁴	2003	1996	1998–2001 ⁴	2003	1996	1998–2001 ⁴	2003
Canada	1	1	2	4	6	5	94	40	23
Australia	3	3	4	3	2	3	21	20	25
Norway	9	6	7	29	21	18	526	136	30
New Zealand	5	3	3	5	2	2	61	37	30
Sweden	3	2	3	15	12	13	69	24	15
Switzerland	6	5	6	10	11	11	...	208	14
United Kingdom	2	1	1	7	5	5	41	10	2
Asia ⁵	7	10	12	14	16	22	277	530	877
Japan	7	11	20	4	6	11	400	299	235
China	9	11	12	11	11	15	373	738	1,300
Hong Kong SAR	4	6	6	19	23	24	37	127	170
India	6	9	17	11	14	26	260	420	601
Indonesia	5	10	13	14	34	31	51	129	258
Korea	3	7	10	6	14	21	45	195	289
Malaysia	4	5	6	28	34	41	226	326	416
Philippines	4	5	4	21	27	30	122	141	132
Singapore	7	8	9	80	77	85	44	99	160
Taiwan, China	10	11	19	17	19	33	458	747	849
Thailand	6	7	7	25	26	30	80	215	404

¹ Months of imports. ² In per cent. ³ International debt securities and liabilities to BIS reporting banks with a maturity of less than one year. ⁴ Average of the period. ⁵ Weighted average of the countries shown based on 2000 GDP and PPP exchange rates.
Sources: IMF; BIS statistics.

Table V.5

In one scenario, the US dollar could continue its appreciating trend. In this case, the incentive to loosen the link of the Asian currencies to the dollar would increase, and hence the need to accumulate US dollar reserves to maintain currency stability would decrease. One example of such a change in behaviour was observed between 1999 and 2001, when a number of Asian currencies tended to co-move somewhat less with the rising dollar and somewhat more with the yen. However, the fact that the US dollar would be appreciating in this scenario would suggest that the absence of Asian financing of the US current account deficit might not be an issue, as the increase in the dollar would tend to be associated with a greater willingness by the private sector to invest in US dollar assets. In this scenario the US current account deficit might tend to widen even more and the adjustment process could be postponed further.

An alternative scenario would result if the Asian central banks decided to reduce their exposure to dollar assets at a time when the dollar was under renewed downward pressure. The likelihood of such a situation developing is difficult to gauge. On the one hand, such action would lead to further depreciation of the dollar and potentially a rise in US yields. There would then be two forces exacerbating the capital loss on the dollar assets held by central banks. On the other hand, individual central banks might feel they could liquidate their holdings before a more generalised outflow led to falls in prices.

In a third scenario, the upward pressure on Asian currencies could cease. If a shock were to hit the Asian economies that resulted in capital outflow from the region, or a decrease in the current level of capital inflow, the downward pressure on Asian currencies – and most importantly the renminbi – would remove the need to accumulate further dollar reserves and could even reverse the trend. The critical question in this scenario would be to which region the capital flows would be reallocated. In the past, in such circumstances, the United States has tended to be a primary beneficiary. Were this to occur in the present circumstances, private investors' willingness to finance the US current account deficit might compensate for the decline in public flows from Asia.