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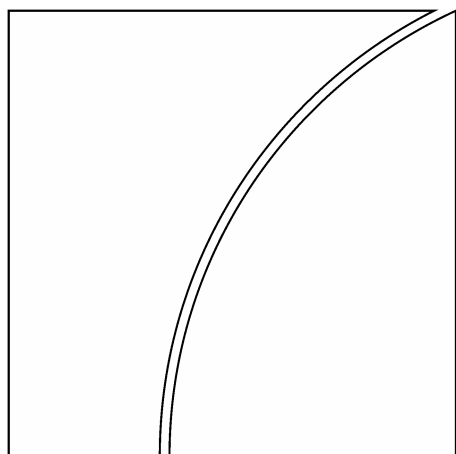
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BANK FOR INTERNATIONAL SETTLEMENTS



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No 23

Globalisation and monetary policy in emerging markets

Monetary and Economic Department

May 2005

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Palle Andersen

This volume is dedicated to Palle Andersen, who passed away on 13 April 2005. The overview paper was co-authored by him, but the full extent of his contribution to this volume was far greater. His exceptional abilities as an economist, his generosity with advice, and his detailed knowledge of so many countries made an enormous contribution to economic analysis at the BIS over the past two decades. His unfailing kindness endeared him to his colleagues and friends throughout the world. He will be sadly missed.

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Conventions used in BIS Papers

lhs, rhs	left-hand scale, right-hand scale
billion	thousand million
...	not available
.	not applicable
\$	US dollar unless specified otherwise

2001-02 refers to a two-year period while 2001/02 refers to a single fiscal year.

Differences in totals are due to rounding.

Financial integration: an overview

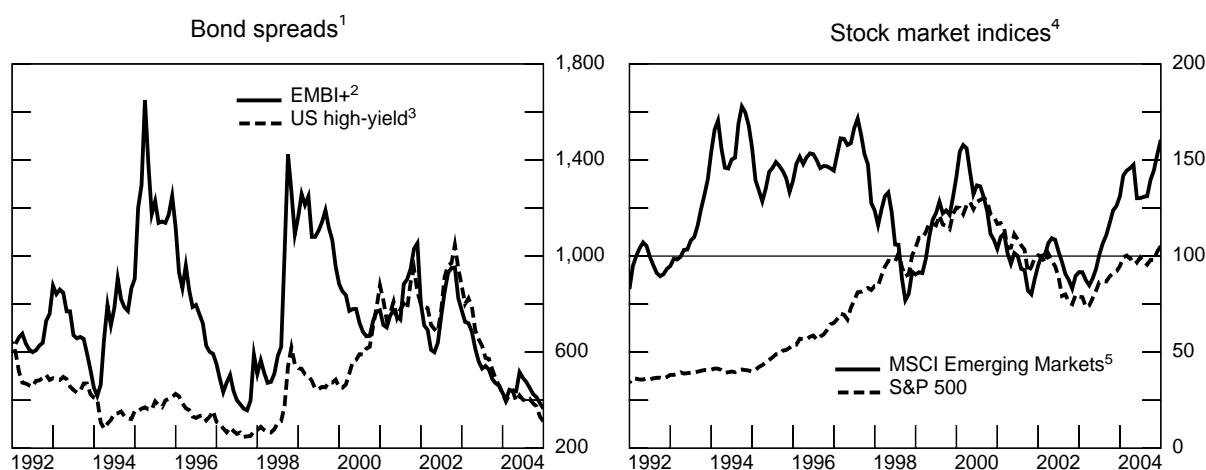
Palle Andersen and Ramon Moreno¹

Introduction

Global financial integration has substantially increased in recent decades. Initially, it manifested itself in growing capital flows between developed countries. In response to the removal of capital controls, financial innovation and technological progress, financial integration has subsequently spread to emerging market countries. Gross and net capital flows between developed and emerging economies have increased. Financial integration has also been evident in frequently high correlations between asset yields or prices, particularly for certain asset classes such as high-yield corporate bonds and sovereign bonds and equities in developed and emerging markets (Graph 1).

Graph 1

Co-movement of mature and emerging market securities



¹ Over US treasury yields; in basis points. ² Stripped spread of emerging market bonds, as calculated by JPMorgan Chase; prior to 1999, EMBI. ³ Spread of US high-yield bonds over US Treasury bonds with similar maturity. ⁴ January 2002 = 100. ⁵ In US dollar terms.

Sources: Bloomberg; Datastream; JPMorgan Chase; Merrill Lynch.

Many argue that increased integration with global financial markets has been key in imposing market discipline on policymakers, and has helped to improve the quality of macroeconomic management. In addition, financial integration in emerging market countries has been driven by a belief that it would increase growth and reduce volatility. Yet the conclusions from a recent comprehensive study (Prasad et al (2003)) of the empirical evidence are disappointing as well as sobering. First, even with a systematic examination of the evidence, it is difficult to establish a robust relationship between financial integration and growth. Second, there is little evidence that financial integration has helped to stabilise fluctuations in consumption relative to income. This could have been expected because theory suggests that financial integration would tend to pool risks across borders. In fact, for countries that are still at an early stage of integration, volatility of consumption relative to income has actually increased. Do these findings imply that the economic, academic literature was wrong (or used the

¹ Comments by Philip Turner, William White and Agustin Villar are gratefully acknowledged. The views expressed are those of the authors, and do not necessarily represent those of the Bank for International Settlements.

wrong model) and that financial integration was a mistake? The following sections attempt to answer this question by first discussing events and developments which suggest that it is still premature to draw firm conclusions about the effects of financial integration. The paper then turns to some recent changes that might increase the benefits of future financial integration. The importance of developing efficient institutions, and specifically the role of foreign banks, is discussed by Moreno and Villar in this volume.

What may account for the apparently negative effects of financial integration?

First, the extent of de jure financial integration, as gauged by measures of financial liberalisation, has been uneven. A number of contributions in this volume describe liberalisation measures that have contributed to greater openness, including Uribe (Colombia). China, India and Thailand have also recently liberalised capital outflows in an effort to dampen the impact of large capital inflows (see contributions by the People's Bank of China, Thirachai, and Mohanty and Scatigna). Nonetheless, China and India (the two largest emerging economies) have maintained significant capital controls. Moreover, there have been reversals, in which countries - in response to external pressures or in an attempt to insulate their domestic markets from the effects of capital inflows - have imposed a variety of controls (see Cifuentes and Desormeaux on Chile and Uribe on Colombia). In order to curb destabilising speculation in foreign exchange markets, several countries have at various times maintained or adopted measures to limit the internationalisation of their currencies, including Indonesia, Malaysia, Singapore and Thailand (see the respective contributions by Hartadi, the Central Bank of Malaysia, Ong and Thirachai). Finally, some countries have imposed capital controls to prevent the outbreak of crises or attenuate their effects (including Malaysia in September 1998 and Venezuela in February 2003). Underlying these varying responses is the reality that financial integration involves some well known trade-offs. Policymakers must weigh possible gains from faster growth and the opportunity to smooth consumption from country-specific shocks against the greater exposure to external shocks.

Second, the pace of financial integration, as measured by gross capital flows, has also been uneven. Following a steep rise during the first half the 1990s, gross capital flows to emerging market countries fell after 1996 and have only recently shown signs of recovery. The decline was particularly pronounced in Asia (outside China) and in Latin America. Other regions (central and eastern Europe (CEE), the Middle East and South Africa) experienced rising or stable inflows. Consequently, the empirical evidence cited above refers to a period when financial integration appears to have declined over a period in some important regions.

Third, net capital has flowed from poor to rich countries. Theory predicts that capital should flow from high-saving developed countries (where the marginal return to capital might be relatively low) to low-saving developing countries (where a high return to capital is expected) and thereby increase the global return to capital. Yet the reality has been totally different. Since 1997, the developed countries have been running a widening current account deficit, almost entirely due to developments in the United States. This deficit has been financed by current account surpluses in and capital outflows from emerging economies, notably Asia. In other words, there has been a net transfer of resources from developing to developed countries. One reason for this apparent paradox might be that returns in emerging market countries are still highly uncertain, notably where debt levels exceed even relatively low thresholds (see Reinhart et al (2003) and Reinhart and Rogoff (2004)).

Fourth, in large parts of Asia, the rise in saving relative to investment has manifested itself in growing foreign exchange reserves. The experience from the Asian crisis in 1997-98 meant that many countries had an incentive to increase reserves to reduce their vulnerability to external shocks. Yet, as discussed in the papers by the People's Bank of China, Mohan and Sidaoui, the continued rise in reserves raises a number of issues, including monetary control, growth and volatility.

Fifth, external shocks may dominate consumption smoothing effects. It is true that access to global markets can help reduce the fluctuations of consumption relative to income emanating from internal shocks. However, if external shocks (nominal as well as real) dominate internal shocks, this benefit may be outweighed by the costs of the new external exposure. This will be particularly true if the external shocks are related to procyclical swings in capital flows and financial integration increases countries' vulnerability to such shocks.

There is strong empirical evidence that external shocks (for instance, terms-of-trade changes) are far more important in developing economies than in developed countries. Similarly, capital flows to

emerging economies are volatile, including episodes of so-called “sudden stops” and closure of access to international bond markets.² There is also some evidence that a certain threshold of domestic market developments and institutions has to be reached before the vulnerability to external shocks can be decisively reduced.³ Most emerging economies are well below that level. This raises an important policy issue: should emerging economies pursue financial integration in the hope that exposure to and competition from global markets and institutions will strengthen domestic financial markets and institutions? Or should they rather develop their own markets and institutions before they open up?⁴

Finally, the monetary/exchange rate regime may play a role. Many countries have removed capital controls while attempting to maintain monetary policy independence by adopting a more flexible exchange rate regime. Bevilaqua and Loyo provide an instructive discussion of how an inflation targeting regime has allowed Brazil to cope with recent episodes of “sudden stops” in capital flows by combining a credible policy commitment to low inflation with sufficient exchange rate flexibility. In spite of significant financial dollarisation Peru has also sought to secure the benefits of a more flexible exchange rate while limiting the potential costs. Its inflation targeting regime reduces the risk of a currency crisis by allowing more exchange rate flexibility, and an “escape” clause allows monetary policy to respond to excessive exchange rate volatility (see Velarde’s paper). Cifuentes and Desormeaux point out that the institutional cornerstones of Chile’s current macroeconomic stability include a monetary regime based on inflation targeting, a floating exchange rate, as well as a fiscal policy based on a structural budget surplus rule. In contrast to other emerging market economies facing external financing constraints, there is scope for countercyclical macroeconomic policy in Chile.

Nonetheless, the broader question of how the exchange rate regime influences average growth and inflation in a financially integrated world remains to be settled. Central banks still tend to intervene or adjust domestic interest rates in response to exchange rate movements rather than use their independence to pursue domestic policy targets. The move to more flexible rates might thus have induced more volatility than central banks had anticipated or domestic exchange markets might not have been sufficiently deep to cope with the new regime. Moreover, the risk of currency mismatches and their potential danger to financial stability was probably seriously underestimated. At the same time, episodes of large capital inflows under a pegged regime also pose significant challenges, including persistent expectations of currency appreciation, the need for sterilised intervention, and overheating in some sectors. Such experiences are reported in this volume by the People’s Bank of China, Latifah (Malaysia), Tetangco (Philippines, for an earlier period) and Al-Jasser (Saudi Arabia). See also Mohanty and Scatigna.

To sum up, independently of their exchange rate regime, financial integration can make countries vulnerable to external shocks that reduce growth and consumption smoothing benefits. Partly as a result, the process of financial integration has been uneven and experienced partial reversals. However, as discussed in the following section, some recent trends suggest that countries might now be in a better position to weather these shocks and increase the gains from financial integration.

Some positive developments

Certain developments in international capital markets since late 2002 have been in marked contrast to the sombre conclusions discussed above. Spreads on emerging market sovereign bonds have fallen back to almost the levels observed before the Asian crisis, and the returns on such bonds have

² International Monetary Fund (2003) estimates that there were 21 bond market closures in 1994-2002, of an average length of 22 days. Most such episodes appear to be concentrated around well known crises or episodes, such as the period around the Mexican crisis in 1994 and the first half of 1995, the Asian crisis in 1997, the Russian crisis in the second half of 1998, and the period of high volatility in US high-yield markets and in emerging market spreads in 2002. The vulnerability to such episodes appears to vary considerably. For example, in 2002, spreads widened a lot more for countries with sub-investment grade sovereign credit ratings, with the result that it was typically the lowest-rated borrowers who were shut out.

³ Kose et al (2003) find that the volatility of consumption relative to output rises at low levels of financial openness but then falls. Countries above the threshold are all developed. In contrast, Lewis (1997) finds that the relationship between domestic income and consumption is looser in countries with no restrictions on international transactions.

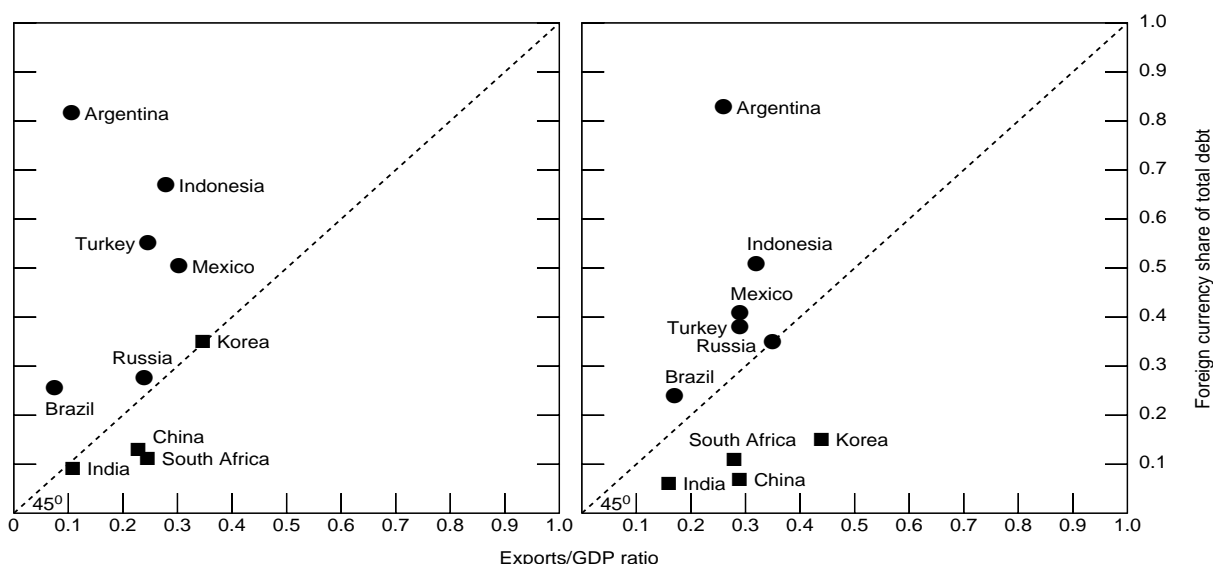
⁴ The same issue emerged when the United Kingdom went back on the gold standard, and also in the context of countries deciding whether to join EMU.

recently been significantly higher than those on developed country bonds. The rise in emerging market equity prices has also been spectacular as portfolio inflows have recovered substantially. Some analysts are sceptical of the sustainability of this rally. Because many emerging economies are exporters of raw materials, it is natural that their equity markets have been among the first to respond to the sharp rise in raw material prices associated with the global recovery. Moreover, experience shows that when interest rates are low in developed countries, investors are prepared to take on more risks in return for higher yields.

There are also signs that “deeper” developments have taken place which, on balance, might reduce the volatility of capital flows and the vulnerability of emerging economies to external shocks. Four important trends can be identified: reduced vulnerability to shocks, including lower currency mismatches; increased use of market-based instruments; deepening of domestic financial markets; and greater discrimination on the part of investors.

First, countries have made *efforts to reduce their vulnerability to external shocks*. In particular, since concerns about debt sustainability have played a role, countries have sought to limit domestic and external debt. Chile has maintained low ratios of public debt to GDP, earning an investment grade rating that has meant much lower increases in sovereign spreads during periods of global market uncertainty. More recently, Brazil and Turkey have taken steps to consolidate their fiscal positions. Currency mismatches in private and public balance sheets have also been reduced, which implies that a number of heavily indebted economies are now less vulnerable to currency depreciation. In Brazil sharp reductions in the proportion of its public debt that is indexed to the exchange rate have played a role. Foreign reserve accumulation has recently been significant in Latin America, and even larger in Asia. At the same time, ratios of external debt to exports have been kept low in Asia relative to other regions. To illustrate trends in currency mismatches, Graph 2 plots the ratio of exports to GDP against the foreign currency share of total debt. Countries shown above the 45° line have a foreign currency share in total debt that is greater than their export/GDP ratio. The further countries are away from the 45° line, the greater is the degree of currency mismatch.

Graph 2
Currency mismatches in 1997 and 2003



Source: Tables 3.2 and 4.6 of Goldstein and Turner (2004).

Mismatches were particularly large in 1997 (Graph 2, left-hand panel). Most Asian countries, however, have in recent years reduced their dependence on foreign currency debt and increased foreign currency earnings: Korea is now well below the 45° line. In Indonesia and Mexico, the foreign currency share of total debt (both public and private) has also fallen substantially in recent years. While there are still significant currency mismatches, preliminary calculations suggest that a number of countries - notably Brazil and Turkey - moved closer to the 45° line in 2003.

Second, international financial integration has encouraged central banks to *shift towards market-based instruments that enhance their ability to respond to shocks*. For example, India moved away

from the use of cash reserve ratios to the use of repo and reverse repo operations. Seeking to enhance the scope of its money market operations and reducing its credit risk, the Monetary Authority of Singapore has expanded from foreign exchange swaps and uncollateralised lending or borrowing to include sale and repo operations in Singapore government securities (see the contributions by Mohan, Ong and Hawkins in this volume). In some special cases, countries have sought to insulate markets from large foreign exchange inflows associated with privatisation or large export revenues (eg from oil) through the creation of special accounts (see the respective contributions by Sidaoui, Böhm and Ždárský, and Mihaljek in this volume).

Third, there has been a *gradual deepening of and improved resilience in domestic financial markets* in emerging economies, often allied with pension reforms (Chile, Poland, Hungary and Mexico) that have helped to increase the base of potential investors. In some cases, governments have encouraged financial market development by stepping up central bank issuance of its own securities (see the papers by Chung and Velarde). However, this has the disadvantage of potentially exposing the central bank balance sheet to interest rate risk and of fragmenting markets by increasing the types of securities on offer. One solution, adopted in India in early 2004, is to issue special government securities to be used by the central bank in managing domestic liquidity. Some countries have adopted legislation to strengthen risk management in the banking sector through improved regulation and liberalised foreign bank entry (see Tetangco's and Moreno and Villar's contributions in this volume).

Fourth, international investors are now better able to differentiate between countries, thus reducing the risk of contagion. For instance, spillovers from Argentina's sovereign bond default in 2001 and of several crises in Turkey were relatively limited. Similarly, concerns about debt sustainability in Brazil in 2002 had a smaller impact on countries that were thought to be less vulnerable (eg with investment-grade sovereign ratings). Finally, while the Yukos event in Russia reminded investors that politics may still dominate economics, the absence of spillovers was also noticeable.

Table 1

Foreign exchange turnover

Daily averages, in millions of US dollars

	2001 (reported by dealers in the country of issue)¹	2001 (reported by dealers outside the country of issue)¹	2001 Total	2004 (reported by dealers in the country of issue)¹	2004 (reported by dealers outside the country of issue)¹	2004 Total
Latin America						
Argentine peso	na	na	na	684	na	684
Brazilian real	4,612	627	5,239	3,127	1,217	4,344
Chilean peso	2,282	na	2,282	2,314	na	2,314
Colombian peso	371	na	371	669	na	669
Mexican peso	5,888	4,198	10,086	10,059	10,253	20,312
Peruvian sol	203	na	203	251	na	251
Asia						
Hong Kong dollar	19,016	8,365	27,381	19,967	13,214	33,181
Indian rupee	2,762	78	2,840	5,313	753	6,066
Korean won	7,916	1,841	9,757	15,815	5,335	21,151
Taiwan dollar	2,609	558	3,167	3,869	3,393	7,261
Indonesian rupiah	535	17	552	1,419	633	2,051
Malaysian ringgit	923	na	923	987	na	987
Philippine peso	455	47	502	523	242	765
Singapore dollar	9,841	3,045	12,886	8,751	8,259	17,010
Thai baht	1,274	585	1,859	2,088	1,403	3,492

Table 1 (cont)

Foreign exchange turnover

Daily averages, in millions of US dollars

	2001 (reported by dealers in the country of issue)¹	2001 (reported by dealers outside the country of issue)¹	2001 Total	2004 (reported by dealers in the country of issue)¹	2004 (reported by dealers outside the country of issue)¹	2004 Total
Central Europe						
Czech koruna	1,135	1,099	2,234	965	1,848	2,813
Hungarian forint	173	24	197	1,380	2,246	3,625
Polish zloty	3,376	2,949	6,325	3,400	3,630	7,031
Russian rouble	4,158	124	4,282	10,631	1,577	12,208
Israeli shekel	506	na	506	1,969	na	1,969
Turkish lira	231	202	433	1,439	552	1,991
Saudi Arabian riyal	840	na	840	689	na	689
South African rand	6,846	4,481	11,327	5,682	7,974	13,656
<i>Memo:</i>						
<i>Australian dollar</i>	<i>20,076</i>	<i>29,577</i>	<i>49,653</i>	<i>27,046</i>	<i>70,077</i>	<i>97,123</i>
<i>Swedish krona</i>	<i>11,466</i>	<i>18,680</i>	<i>30,146</i>	<i>13,811</i>	<i>26,828</i>	<i>40,639</i>
<i>Swiss franc</i>	<i>17,767</i>	<i>53,286</i>	<i>71,053</i>	<i>21,143</i>	<i>86,562</i>	<i>107,705</i>
Total²	634,650	538,416	1,173,066	943,542	829,896	1,773,438

na = not available

¹ Including local and cross-border transactions. ² Since two currencies are involved in each transaction, the sum of transactions in all individual currencies would come to twice the total reported turnover.

Note: Figures are daily averages during April; sum of spots, forwards and foreign exchange swaps, adjusted for local and cross-border double-counting.

Source: Bank for International Settlements, Triennial central bank survey of foreign exchange and derivatives market activity, 2001 and 2004.

Globalisation and financial markets

Notwithstanding these favourable developments, which might help to attract foreign investors and stimulate domestic investment, financial integration may imply that emerging financial markets are more vulnerable to certain types of shocks, and that it may be difficult in some instances to find suitable instruments to manage these shocks. For example, consider how foreign exchange markets (the main conduit for the transactions that occur as a result of growing financial integration) have evolved and what this might imply for economic and financial stability. Greater financial integration may amplify volatility in foreign exchange markets, and this effect may be heightened by the introduction of modern risk management techniques.⁵ This creates a risk that market participants will withdraw liquidity (ie increase their reservation price or simply halt trading) in the face of stress. Market

⁵ These techniques rely on value-at-risk (VaR) measures, which are positively correlated with historical volatility: if volatility rises above its historical value, the financial institution might become capital constrained and forced to unwind its position. A recent example of how market volatility is then amplified is the Japanese government bond market; see Packer and Wooldridge (2003, pp 2-3).

participants may also have to unwind their positions involuntarily (due to triggers or prudential requirements) in ways that might increase volatility in other markets. At the same time, however, globalisation may encourage the development of deeper foreign exchange markets, which may increase resilience to shocks. The results of the 2004 BIS triennial survey of foreign exchange markets indicates greater depth along a number of dimensions (Table 1). First, foreign exchange market turnover increased considerably between 2001 and 2004, over 50% overall and even faster in a number of emerging market economies. This suggests a significant increase in total liquidity. Second, the share of offshore transactions in many emerging market currencies has risen significantly, possibly spurred in part by the availability in major financial centres of electronic platforms that lower transaction costs and increase market transparency. Third, turnover in forward or swap transactions has increased relative to spot transactions in a number of emerging market currencies, suggesting greater use of hedging instruments. For example, between 2001 and 2004 net foreign exchange turnover in the Korean won forward and swap markets increased 262% and 95% respectively, compared to an increase of 83% in the spot market. Rapid growth in forward or swap market turnover is also apparent in the currencies of India, Mexico, Thailand and Turkey (from low levels) among others. Goldstein and Turner (2004, p 59) suggest that a larger share of offshore derivative transactions are characteristic of more liquid foreign exchange markets.⁶

Turnover has not increased in all emerging market currencies. One explanation for this might be that central banks have significantly reduced their participation in forward markets as a result of losses incurred. The introduction of restrictions on forward currency markets or capital controls could also have played a role. For example, the measures adopted by the Malaysian authorities in September 1998 curtailed forward transactions in the ringgit. The Indonesian country paper describes measures designed to limit rupiah lending to non-residents, which would discourage taking speculative positions via forward markets (although forward or swap market rupiah transactions have nevertheless grown). In other cases, capital controls have induced forward markets to move offshore. In 2003, in an effort to dampen the appreciation of the baht, the Thai authorities limited the amount of baht deposits non-residents could maintain. This constrained the ability of non-residents to take a long position on the baht and even larger long positions in the forward market. In Asia, the effects of such restrictions have in some cases been at least partly offset by the development of non-deliverable forward (NDF) markets in Asian currencies, which account for the bulk of global NDF market activity.⁷ Led by the NDF market in Korea (average daily turnover in excess of USD 500 million), NDF markets appear to have deepened significantly in recent years (see Ma, Ho and McCauley (2004)).

It remains unclear whether financial integration has stimulated or retarded the development of domestic financial markets. On the one hand, the exposure to foreign competition has helped in some cases and foreign investors have also started to purchase domestic currency paper instead of dollar-denominated paper. For example, in his contribution to this volume, Chung documents the very high penetration of foreign investors in the equity markets in Korea. Goldstein and Turner (2004, Tables 5.2 and 5.3) document increases in bond trading volume and in domestic debt securities outstanding in emerging market economies. Nevertheless, recent research suggests that there is further scope for improving liquidity in emerging bond markets (McCauley and Jiang (2004)). Furthermore, with the removal of capital controls, large emerging market companies with high ratings are also covering their external financing needs by issuing bonds in the international market or listing in New York or other advanced equity markets.

⁶ In interpreting the data, it is worth bearing in mind that turnover in emerging market currencies may have been unusually high in April 2004, when the most recent BIS triennial survey was conducted. The reason is that there was a sharp increase in US long-term rates and in some emerging market sovereign spreads in that month in anticipation of monetary tightening by the Federal Reserve. In this setting, investors taking speculative positions in an emerging market currency might also prefer to do so offshore, where they are not subject to any foreign exchange restrictions or monitoring by the emerging market central bank issuing the currency.

⁷ NDFs involve no settlement on the notional value of the transaction. Payments are only made if there is a difference between the contracted rate and the actual rate on the day the contract comes due. The settlement is usually in a currency different from that of the pertinent emerging market currency (say in US dollars rather than Chinese renminbi) and in a jurisdiction outside that emerging market.

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The increased role of foreign bank entry in emerging markets

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Foreign banks and credit markets

The past decade has seen a transformation of the role of foreign banks in emerging markets. It has been a process that has often aroused considerable controversy, and featured prominently in two earlier meetings of Deputy Governors (1998 and 2000).² The benefits foreign banks can offer are now much more widely recognised. But it would be naive to pretend that there are no drawbacks or no difficult choices for local supervisory authorities. The supervisory response to the rapid rise of foreign banks is still being refined - and, in some countries, remains an important task.

Foreign banks have become well established as key vehicles in the international integration of the financial systems of emerging market economies. There has been a strategic shift by foreign banks away from pursuing internationally active corporate clients towards the exploration of business opportunities in the domestic market. One standard indicator of foreign bank presence is the share of assets of foreign-controlled banks (Annex Table A1), which has increased significantly in many countries. Another indicator of foreign influence is the ratio of local claims of BIS reporting banks to domestic bank credit; this is shown in the last column of Table 1.

It is clear that the degree of foreign penetration has differed sharply across regions. There has been a radical transformation in Latin America and central Europe in the space of a very few years. Privatisation (in the Czech Republic, Hungary, Poland, Brazil and Peru) and the need to recapitalise the financial system following financial crises (Mexico and Korea) have been important driving forces. In Asia, by contrast, the penetration of foreign banks has been much less (8%). The main exceptions are Hong Kong SAR, Singapore, Thailand (where the ratio has risen) and Malaysia.

A development of great importance has been that lending by big local affiliates has progressively displaced direct dollar-denominated lending by the head offices of international banks (Table 1, column 3). This is potentially a positive development as it can mean greater borrowing in local currency and thus smaller currency mismatches. In addition, the deeper local presence of international banks may contribute to greater efficiency and resilience of the financial sector.

The greater scale and changing character of foreign participation in banking systems raise many questions: about the impact on the efficiency of financial institutions; about the macroeconomic effects on aggregate lending and on the responsiveness to monetary policy; and about the implications for financial sector stability. The following paragraphs outline some of these issues.

The impact on efficiency and aggregate lending³

A larger foreign bank presence can enhance the competitiveness of the banking sector. Greater competition is desirable for a number of reasons: to enhance the efficiency of financial services; to stimulate innovation; and to contribute to stability. It can also widen access of qualified borrowers to

¹ Comments by Philip Turner, William White and Dietrich Domanski, advice by Philip Wooldridge and research support by Marc Klau are gratefully acknowledged.

² The papers for these meetings are in BIS (1999) and BIS (2001). A summary is Hawkins and Mihaljek (2001), pp 24-32.

³ Additional perspective on the benefits of foreign bank entry is provided by CGFS (2004), Goldberg (2003), Chua (2003), Cardenas et al (2003), and Kim and Lee (2003). CGFS (2004) and other country reports also discuss issues from the home country perspective which are outside the main focus of this paper. Wolf (2004) is very persuasive on the need for substantial inward FDI in the financial sector (see especially Chapter 13).

financing, which may increase aggregate lending and so enhance growth.⁴ A more competitive and efficient banking system can also improve the effectiveness of monetary policy transmission by tightening the link between policy rates and deposit/lending rates.

Table 1
Claims on BIS reporting banks¹

	International claims ²			Local claims ³			Local claims/ international claims			Local claims/ domestic bank credit		
	1995	2000	2003	1995	2000	2003	1995	2000	2003	1995	2000	2003
	in billions of US dollars						in percentages					
Asia⁴	730	471	422	160	308	360	22	65	85	8	10	8
China	48	58	49	0	3	6	1	6	12	0	0	0
Hong Kong SAR	241	110	88	96	165	167	40	150	190	48	66	72
India	16	22	22	8	17	24	54	76	106	7	8	8
Indonesia	45	40	29	4	5	6	8	11	20	3	6	7
Korea	78	59	65	8	18	29	11	31	45	3	5	5
Malaysia	17	21	22	4	29	33	25	139	152	5	30	29
Philippines	8	17	17	1	5	5	17	32	28	4	13	12
Singapore	192	100	91	22	32	46	11	32	51	26	29	37
Taiwan, China	23	18	21	10	16	26	44	90	120	2	3	6
Thailand	63	27	17	5	17	19	9	62	113	3	13	15
Latin America⁴	195	260	195	38	222	243	20	85	125	8	41	52
Argentina	38	69	25	4	23	13	10	34	55	7	29	32
Brazil	57	68	52	21	72	52	36	107	100	9	31	23
Chile	14	22	20	8	28	23	58	124	112	25	64	55
Colombia	11	12	8	1	5	5	8	46	59	5	25	21
Mexico	57	64	68	4	80	142	8	126	210	3	58	119
Peru	6	13	11	1	3	3	10	24	27	7	22	21
Venezuela	12	13	12	0	10	6	3	76	48	2	66	77
Central and eastern Europe⁴	76	92	119	4	52	93	5	56	78	3	33	35
Czech Republic	8	11	16	2	15	32	31	135	206	6	53	80
Hungary	9	17	27	1	8	14	8	47	52	5	41	35
Poland	7	24	35	1	27	44	12	112	125	2	48	55
Russia	52	40	41	0	1	2	0	2	6	0	2	2
Other⁴	60	95	87	2	7	8	3	8	9	1	2	2
Algeria	13	5	4	0	0	1	1	7	14	1	2	
Israel	5	8	10	0	0	1	0	3	5	0	0	0
Saudi Arabia	8	17	16	0	0	0	1	0	0	0	0	0
South Africa	16	18	20	1	4	4	6	20	21	1	5	4
Turkey	19	47	37	1	3	2	3	6	6	2	3	3

¹ Outstanding positions at year-end; for 2003, end of June. ² BIS reporting banks' cross-border claims in all currencies and their foreign affiliates' local claims in foreign currencies (consolidated banking statistics). ³ BIS reporting banks' local claims in local currencies. ⁴ Total of the countries shown.

Sources: IMF; BIS.

⁴ However, performance measures such as bank margins or profitability may not always measure competitiveness adequately, because performance may be influenced by other factors such as macroeconomic conditions, taxation and institutional factors.

A number of studies have investigated empirically the effects of foreign bank entry on the efficiency of the financial sector. The evidence generally suggests that increased entry, including by foreign banks, is associated with greater competition. For example, using a data set of regulatory restrictions applied in 107 countries in 1999, Barth et al (2001) find that tighter entry restrictions are associated with lower bank efficiency (higher interest rate margins and overhead expenditures). Claessens et al (2001) find that foreign bank entry tends to reduce profit margins in the banking sector. Demirgüç-Kunt et al (2003) find that greater bank concentration is associated with lower bank efficiency in emerging economies. Claessens and Laeven (2003) find that greater foreign bank entry and lack of entry and activity restrictions are associated with more competition.⁵ Moreover, there is evidence that competitive pressures are greater in those areas where foreign banks are active.

Foreign bank entry can also help countries recapitalise their banking systems in the aftermath of banking crises, providing the basis for a revival of bank credit. For example, in 1995 the Mexican banking system became insolvent as a result of bad loans and the very high interest rates that followed the collapse of the Mexican peso. Notwithstanding considerable government support, bank credit to the private sector did not grow for several years. As the system was opened to foreign participation, the stronger capital base and the removal of bad loans provided incentives for banks to resume lending. As reported in Table 1, the ratio of local claims of foreign-owned BIS reporting banks to credit provided by domestic banks in Mexico is 119%. Banks that are more than 50% foreign-owned control nearly 82% of banking sector assets (Annex Table A1).

In stark contrast, however, reliance on foreign banks has been much less in Asian economies affected by the 1997 crises. The ratio of international bank local claims to domestic bank credit is 30% in Malaysia, 15% in Thailand and still lower in Korea, Indonesia and the Philippines. One interesting question is why there has been less reliance on foreign banks in Asia after the Asian crisis than in other regions after crises in those regions. Possible explanations could include the high domestic saving rates (which kept banks liquid) and large government-financed bailouts.

The impact on financial and economic stability

Foreign bank entry may enhance financial stability by permitting greater diversification of exposures and by improving risk management. It could also contribute to making more capital or liquidity available when needed.

A foreign bank presence could be particularly valuable during periods of banking stress, to diversify against country-specific (systemic) risks that can severely impair the capital of the banking system. The fact that foreign banks are diversified across different countries could well change the cyclical behaviour of the host country financial system since foreign banks are less sensitive to host country cycles. How valuable this proves to be in practice depends on how closely the domestic economic cycle is correlated with the global economy. Counter cyclical changes in foreign bank lending could also help to amplify the effectiveness of monetary policy. Foreign banks could also be more resilient during currency crises. Not only do they tend to be more aware of currency mismatches, they can also call on their parent organisations to provide foreign currency liquidity.

A number of empirical studies suggest foreign banks do indeed play a stabilising role. Using BIS banking statistics for a set of Latin American countries over the period 1985-2000, Martinez Peria et al (2002) find that, while foreign banks transmit external shocks to their host countries, they become more responsive to host country conditions over time and their lending reacts more strongly to positive than to negative host shocks. They also find that foreign bank lending is not significantly curtailed during crises; hence greater foreign bank participation may be associated with a reduced probability of crises (Levine 1996).

The behaviour of foreign banks during certain crisis episodes illustrates the potentially stabilising role they can play. For example, Detragiache and Gupta (2004) find that foreign banks did not abandon the local market during the 1997-98 crisis in Malaysia and received less government support than

⁵ Their measure of bank competition differs from others because it is based on a structural contestability approach. It tests whether an increase in input prices raises both marginal costs and total revenues by the same amount as the rise in costs (perfect competition), or whether an increase in input prices increases marginal costs, reduces equilibrium output and therefore total revenues (monopoly), or whether the response is somewhere in-between.

domestic institutions.⁶ In another instance, that lending by foreign banks in Argentina and Mexico grew faster than lending by domestic banks during the 1994-95 crises (Goldberg et al (2000)). The behaviour of foreign banks in Argentina during that earlier period is confirmed by the paper by Lacoste in this volume.

There are nonetheless three important questions about the role of foreign banks.

First, a large foreign banking presence could mean that information available to host country supervisors can be reduced to the extent that decision-making and risk management shifts to the parent bank. The delisting of the equity of local affiliates on the local exchange removes an important source of market intelligence. In addition, if the integrated firms' equities are delisted in the local market, host country supervisors can also lose access to key foreign bank decision-makers.

Second, a large foreign bank presence can expose a country to shocks due to purely external events, such as those affecting the parent bank. The factors that determine vulnerability to such external shocks, whether the exposure is greater with onshore foreign banking as compared to traditional cross-border bank lending, and the implications for regulatory and supervisory policy also warrant further investigation.

A third issue is the regulatory treatment of foreign currency denominated lending. A borrower that chooses dollar borrowing to cover local currency business makes itself a worse credit risk - but this is often not sufficiently recognised either by the bank in its risk management techniques or by the regulators. As Basel II aligns capital requirements more closely to differences in credit risk than Basel I, regulatory distortions should be reduced. And over time the more systematic use of default data should clarify which foreign currency loans should be regarded as a worse credit risk than local currency loans.⁷

The first two concerns have been cited by a report on FDI in the financial sector by the Committee on the Global Financial System (CGFS (2004)) and apply to a number of countries, including Mexico and New Zealand (see Cardenas et al (2003)) and Bollard (2004).

The series of events that culminated in Argentina's financial crisis in 2001 raises several important questions. Lacoste finds that foreign banks played no stabilising role in these circumstances.⁸ The explanation for this conclusion - which contradicts what might have been explained - is not clear. In what ways might the response depend on the nature of the shock and on the economic policies followed by the host country government? How are regulatory constraints, or the relative ability or incentive to access lender of last resort facilities, affected by the shift from cross-border to onshore operations? What does this imply for the reaction of foreign banks during periods of financial stress? Answers to these questions would have an important bearing on risk management by foreign firms and the oversight of foreign regulators.

Another line of research suggests that foreign bank entry might contribute to greater stability by increasing profits, and improving capital cushions, in the banking sector. There is some evidence that the rationalisation of banking services following foreign entry (or foreign competition) lowers overhead costs and so improves profits. A less satisfactory outcome would be that foreign banks raise profits by reducing competition, which appears to occur in some cases.⁹ Levy Yeyati and Micco (2003) study the evidence for eight Latin American countries and find that foreign bank penetration appears to have led to less competitive banking sectors. The higher profits strengthen the financial position of banks and lower their risk level. Lower risk is not necessarily due to safer lending by foreign banks compared to

⁶ They also find that the banks not specialising in Asia were more profitable than banks that did specialise in Asia during the crisis, enjoying higher interest margins and fewer non-performing loans.

⁷ This issue is discussed in Goldstein and Turner (2004), pp 85-8.

⁸ Some empirical evidence that foreign banks may accentuate economic volatility (as measured by year-to-year fluctuations in real GDP and investment) in emerging economies is provided by Morgan and Strahan (2003), who study nearly 100 countries over the period 1990-97. More precisely, volatility is the square or the absolute value of residuals from a first-stage growth regression of GDP growth (or investment growth) on a set of time fixed effects, country fixed effects, a measure of banking integration, and other control variables. However, this study does not directly examine the importance of flows associated with the foreign banking sector.

⁹ Claessens et al (2001) argue that foreign banks in emerging markets have higher net margins and profitability, as well as higher overhead costs, so their higher returns do not appear to be due to higher efficiency.

domestic banks but rather to higher profits and charter value that the average foreign banks can obtain. Foreign banks can do this because their products are not perfect substitutes for the products offered by domestic banks.

Foreign bank entry may also lower risk through improved risk management techniques and more realistic provisioning against bad loans. As those techniques become more deeply rooted in the local banking culture (and perhaps as the quality of supervisory oversight improves), the stability of the local financial system should improve. Nevertheless, two issues are sometimes raised. First, the expertise and the extra resources of foreign banks might allow them to take the more profitable and creditworthy borrowers away from domestic banks, adversely affecting the profitability of the latter. Kim and Lee (2003) suggest that foreign banks may have had this effect in Korea. Second, foreign banks could concentrate their lending on large enterprises, instead of small and medium-sized enterprises and other creditworthy borrowers that are “informationally opaque”. This argument, which was once a fashionable critique of foreign banks, now appears less convincing as foreign banks increasingly demonstrate their ability to expand their business with households. In this business, foreign banks have brought improvements in credit scoring techniques and in securitisation techniques.

There is, however, no decisive cross-country empirical evidence that foreign bank entry adversely affects lending to small and medium-sized enterprises.¹⁰ One study uses data from four Latin American countries to confirm that foreign banks in fact do lend less to small businesses. However, this reflects the behaviour of small foreign banks, which may lack the resources to evaluate small borrowers. Another study estimates how borrower perceptions of credit conditions are affected by foreign bank entry, drawing on a survey of over 4,000 enterprises in 38 developing countries’ economies. It concludes that foreign bank penetration improves the access to credit for all firms. Small firms benefit even if large firms benefit more.

Policymakers in emerging economies have sought to enhance credit availability to small borrowers by seeking to reduce credit risk in two ways: (1) making information available to facilitate the assessment of the creditworthiness of borrowers in the economy, for example via the establishment of credit bureaus; (2) making it more costly for borrowers to fall behind in their payments, for example by improving the ability of lenders to attach assets.

¹⁰ Clarke et al (2001) and Clarke et al (2002).

Annex

Table A1
Foreign ownership of banks

	Assets owned by banks with 50% or more foreign ownership ¹			Assets owned by banks with more than 10% but less than 50% foreign ownership ¹		
	1990	2000	2002	1990	2000	2002
China	.	.	.	.	.	.
Hong Kong SAR	45.7	87.2	88.6	3.7	7.2	6.2
India	21.0	42.0	40.0	.	4.0	5.0
Indonesia						
Korea	.	32.7 ²	32.3	.	7.5 ²	14.4
Malaysia	22.3	24.9	25.2	34.1	30.5	38.7
Philippines						
Singapore	89.4	75.7	76.0	...	...	...
Thailand	–	5.9	5.8	.	45.8	48.6
Argentina	17.0 ³	48.1	41.6	.	13.4	12.7
Brazil		25.2	21.5		7.0	6.2
Chile	18.6	33.1	44.8	5.5	16.5	3.0
Colombia	3.7 ⁴	18.0	16.4	6.6 ⁴	13.7	13.6
Mexico	0.3	54.6	81.9	.	0.3	0.6
Peru	0.0	32.6	30.4	10.5	9.2	14.4
Venezuela		49.7	37.4		7.7	0.8
Czech Republic	26.4	65.4	85.8	63.7	22.1	8.3
Hungary	11.4 ⁵	69.9	90.4	8.2 ⁵	23.8	–
Poland	0.02	69.5	67.4	0.02	1.4	2.1
Russia	7.2 ⁶	9.5	8.1	5.5 ⁶	3.1	2.3
Israel	.	.	.		20.2	12.8
Saudi Arabia	–	–	–	7	6	6
South Africa						
Turkey	2.9	3.6	3.3	0.8	–	–

Note: . not available; – nil; ... not applicable.

¹ As a percentage of total banking sector assets, at end-year. ² 2001. ³ 1991 as a percentage of deposits. ⁴ 1992. ⁵ 1993.

⁶ 1998.

Source: Central banks.

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Has globalisation reduced monetary policy independence?

M S Mohanty and Michela Scatigna¹

1. Introduction

Growing global financial integration has influenced monetary policy in important ways. Theory predicts that, other things being equal, with a highly open capital account, monetary authorities lose independence in setting domestic interest rates. The effectiveness of monetary policy and its transmission would then depend on the exchange rate regimes in place. For example, as predicted by the Mundell-Fleming model, when the exchange rate is fixed, capital flows will equalise domestic and international interest rates, with monetary policy losing its ability to influence domestic activity.² On the other hand, when the exchange rate is flexible, monetary policy will be effective in part through the exchange rate. A reduction in domestic interest rates, say to promote growth, would lead to capital outflows. At the same time, it would depreciate the exchange rate, with expansionary effects. When countries maintain capital account restrictions, or the domestic and foreign assets are not perfect substitutes, central banks may retain control over monetary policy even with a fixed exchange rate.

Recent developments have shown, however, that, while many countries have adopted more flexible exchange rate regimes, they often intervene to dampen exchange rate movements. In many cases, such intervention may be warranted by sharp volatility in capital flows. For instance, after rising to 3% of GDP in the first half of the 1990s total net capital flows to developing countries fell to about 1% during 2000-03. Some have characterised the recent trends in capital flows to emerging economies by such common features as frequent “market closures” and “sudden stops” of inflows.³ In a number of countries, volatility in capital flows has been associated with speculative currency attacks, resulting in large changes in the exchange rate, high inflation and substantial loss of output.

Such developments raise several questions. How does the choice of an exchange rate regime affect monetary policy independence? Should central banks attempt to reduce vulnerability to crises by containing currency fluctuations when exchange rates have, in principle, been allowed to vary freely? If so, how should this best be done given the various policy instruments available? What dilemmas might the central bank face when exchange rate volatility is dampened by using the interest rate instrument? Are other policy instruments useful in reducing such dilemmas? The rest of the paper addresses these issues. Section 2 briefly discusses the choice of exchange rate regime in the context of greater global financial integration. Section 3 reviews recent movements of exchange rates and addresses the reasons why the authorities might wish to resist such movements. Section 4 explores the implications for monetary policy. Section 5 discusses the role of foreign exchange intervention, while section 6 focuses on capital account policies.

¹ The paper draws on information provided by the relevant central banks and has benefited immensely from their suggestions. We thank Jeffery Amato, Palle Andersen, Claudio Borio, Andrew Filardo, Gabriele Galati, John Hawkins, Ramon Moreno, Philip Turner, Bill White and the seminar participants at the Bank for International Settlements for valuable suggestions; Marc Klau for very useful statistical advice; and Clare Batts and Monica Mauron for excellent secretarial assistance. The views expressed are those of the authors and do not necessarily reflect those of the BIS and central banks attending the meeting.

² As emphasised by Mundell (1968), authorities would require another policy instrument, viz fiscal policy, for maintaining internal and external balance.

³ Some have associated the high volatility of capital flows to emerging economies with their domestic imbalances such as unsustainable fiscal policies, weak financial systems and implicit exchange rate guarantees; see Summers (2000). Others have attributed it to factors such as external financial shocks, contagion, and the rising importance of informed investors, raising the chances of “rational herding” and vulnerability of countries to “sudden stops” of capital inflows; see Calvo (2001).

2. The choice of exchange rate regime

Countries have sought to limit their vulnerability to a currency crisis by choosing an appropriate exchange rate regime. Theory indicates that it is impossible for an economy to simultaneously pursue a fixed exchange rate, an independent monetary policy and an open capital account (the so-called “impossible trinity”). Once policymakers have decided to liberalise cross-border capital movements, the choice then is to either fix the exchange rate or have an independent monetary policy (or some combination of the two).

Yet views differ regarding the sustainability of exchange rate regimes. According to one view (the “bipolar” view), soft exchange rate pegs that take various intermediate positions between full exchange rate flexibility and hard pegs are less viable for economies with substantial involvement in international capital markets.⁴ The argument is that such exchange rate regimes make countries more vulnerable to currency attacks.⁵ This has given rise to the “hollowing of the middle” hypothesis; in the long run the only sustainable option for countries is to move to either a hard peg (representing regimes such as currency boards, dollarisation and a common regional currency) or a fully floating exchange rate regime.

A supporting set of arguments for the bipolar view emphasises the particular limitations of soft pegs in the context of emerging economies. According to this view, some countries are unable to borrow in their own currencies (“original sin”). This will force them to rely more on foreign currency borrowing, especially as cross-border capital restrictions are removed.⁶ This increases their vulnerability to currency mismatches and large exchange rate depreciations, reducing the advantages of a floating exchange rate. Others attribute such currency mismatch problems to emerging economies’ financial imperfections that can be removed by appropriate macroeconomic and regulatory policies rather than to their inability to borrow in their own currencies; see Goldstein and Turner (2004).

An alternative view (the so-called “fear of floating” view) notes that many emerging economies, in practice, prefer to limit exchange rate movements while, in principle, they may have adopted a flexible exchange rate regime. Such resistance to floating arises from their low policy and institutional credibility and high degree of pass-through of exchange rate changes into prices; see Calvo and Reinhart (2002). One implication of this view is that floating exchange rate regimes are likely to differ by degrees, depending on the strength of the authorities’ preference for exchange rate smoothing. Goldstein (2002) has recently suggested a “managed floating plus” regime for emerging economies where three elements - exchange rate smoothing, inflation targeting and regulatory and market development policies to reduce currency mismatches - are said to lead to a credible exchange rate regime with considerable independence for monetary policy.

Notwithstanding the competing views, most recent discussions have tended to emphasise the need for greater exchange rate flexibility in emerging economies. Two major developments seem to have shaped much of this view. First, as the Mexican and Asian crises in the second half of the 1990s demonstrated, a fixed or semi-fixed exchange rate often led to significant overvaluation of the real exchange rate. This encouraged banks and the corporate sector to borrow excessively from abroad and at short term, increasing the vulnerability of countries to capital flow reversal. As the exchange rate became highly overvalued, the interest rate required to stabilise the exchange rate rose to a very high level, setting the stage for successful currency attacks: see Fischer (2001). In more recent years, such problems have been further highlighted, for instance, by the collapse of the crawling exchange rate regime in Turkey in early 2001. In contrast, with the exchange rate allowed to move in both

⁴ Fischer (2001) defines intermediate currency regimes as the ones “where the government is viewed as being committed to defending a particular value of the exchange rate or a narrow range of the exchange rates, but has not made the institutional commitments that both constrain and enable monetary policy to be devoted to the sole goal of defending the parity”.

⁵ See, for example, Obstfeld and Rogoff (1995), Fischer (2001), Summers (2000), Mussa et al (2000) and Frankel (1999). An opposite view is that of Williamson (2000), who argues that it is possible for countries to design a viable intermediate exchange rate regime even with substantial involvement in international capital markets by announcing publicly monitored exchange rate bands around a central parity. This would provide a signal to the market about the long-term path of the exchange rate and reduce the probability of future currency misalignment.

⁶ The “original sin” hypothesis was first proposed by Eichengreen and Hausmann (1999). See also Hausmann et al (1999).

directions in Mexico after the 1995 crisis, the private sector's expectation of an implicit exchange rate guarantee disappeared; see Ortiz (2000).

Second, with growing trade openness and the increased incidence of external shocks, the role of the exchange rate as an automatic stabiliser has become better appreciated. To the extent that wages and prices are rigid, a fall in external demand is expected to lead to a fall in both the nominal and real exchange rate, thus partially mitigating the impact of the adverse shock. Moreover, a flexible exchange rate may enable the central bank to use monetary instruments to influence domestic spending, further cushioning the economy against external shocks. Recent empirical evidence generally supports the positive influence of exchange rate flexibility on the trade balance and output in emerging economies. For example, over a large sample of countries with different exchange rate regimes, Broda (2001) shows that developing countries with a flexible exchange rate were better able to cope with terms-of-trade shocks than those with fixed exchange rates.⁷

To describe the issue from another perspective, when the exchange rate is fixed, prices must fall significantly to bring about the required real exchange rate and current account adjustments. From this standpoint, a fixed exchange rate can make deflation more likely when the economy is subject to large and frequent negative external shocks. Goldstein (2002) points out that during 1999 and 2000, when the Federal Reserve was raising interest rates to stabilise an overheating economy, Argentina had to raise rates although it was already going through a severe recession. By the time the Federal Reserve started to reduce rates in 2001, recession in Argentina had become well entrenched in the presence of large external debts.

The recent experience

Reflecting these insights and developments, there has been a recent trend towards flexible exchange rate regimes. For example, according to the IMF's (2003)⁸ de facto classification of exchange rate systems, the number of emerging economies (out of 32 systemically important economies) opting for a flexible exchange rate regime has risen from a little above 15% in 1990 to about one half at the end of 2001. The share of hard peg regimes has seen a moderate increase from under 10% to a little above 15% during the same period, while that of the intermediate regimes has fallen sharply from over three quarters to less than 35%. Table A1 in the annex shows the exchange rate and monetary policy regimes in emerging market economies between 1997 and 2002. China, Hong Kong SAR,⁹ Malaysia and Saudi Arabia are among the monetary regimes with a fixed exchange rate. However, with the exception of Hong Kong, other countries have maintained some degree of capital controls, and hence, in effect, retained various degrees of monetary independence. After a prolonged period of market volatility, Venezuela fixed its exchange rate and announced capital controls in early 2003.

Other countries have adopted some form of floating arrangement. Many have combined it with inflation targeting - starting from Chile in 1990 to Peru in 2003 - to provide a credible nominal anchor for monetary policy. In some other countries (for example India), the nominal anchor role is played by monetary aggregates or a combination of monetary and other financial variables. In Argentina, the abandonment of the currency board in 2002 has led to a floating exchange rate. Under the transitional arrangement, monetary policy is being conducted by targeting base money. Singapore has adopted the nominal effective exchange rate as an operating target for monetary policy, with the stance of the exchange rate policy determining the short-term interest rate. The major economies in central Europe, such as the Czech Republic, Hungary and Poland, have introduced inflation targeting with a floating exchange rate. Hungary has adopted a horizontal band for the exchange rate with the central parity being allowed to move within $\pm 15\%$ since May 2001.

The institutional framework for exchange rate management varies across countries. In many countries, the central bank is responsible (second last column of Table A1 in the annex), but in Israel and

⁷ Broda's (2001) estimates suggest that a 10% deterioration in the terms of trade leads to a decline in the exchange rate by 4.4% during the same year in countries with floating exchange rates compared to 1.3% after two years in those with a fixed exchange rate. The short-run negative output effect is about 1.7% lower in the former than the latter.

⁸ Economies have been classified based on the observed behaviour with respect to their exchange rate commitments rather than official announcements.

⁹ Hereafter, referred to as Hong Kong.

Hungary the government has sole responsibility for the conduct of exchange rate policy. In many others (for example China, Korea, Poland, Russia and Turkey), some form of institutional framework exists for coordination between the government and the central bank. Country experiences also differ regarding the monitoring of exchange rate developments. Most countries focus on the bilateral exchange rate against either the dollar or the euro (mainly central European countries) for monitoring purposes (last column of Table A1). Nevertheless, effective exchange rates (both nominal and real) also appear to matter, particularly for monitoring long-run currency misalignments and changes in the competitive position.

3. Exchange rate flexibility in practice

Indicators of volatility

Table 1 presents the standard deviations of three major exchange rate indicators - the bilateral, the nominal effective and the real effective exchange rates for two periods: 1991 to 1996 and 1999 to 2003. This excludes two crisis years, viz 1997 and 1998, when many countries, affected by the global financial crisis, saw a sharp increase in exchange rate volatility. As the table shows, with the exception of Indonesia, bilateral exchange rate volatility among the floaters in Asia is only marginally higher, and has fallen in India. In central and eastern Europe, excepting Russia, there is some evidence of greater exchange rate volatility against the euro.

In Latin America, the volatility of bilateral exchange rates fell in Brazil, Mexico, Peru and Venezuela (until 2002) in the recent period, although this might reflect a decline in the incidence of large exchange market collapses from the previous period. Exchange rate volatility has risen substantially in Argentina, following the collapse of the currency board, as well as in Chile since the transition to a flexible regime in 1999. This trend is observed in both the nominal and real effective exchange rate indicators. Elsewhere, South Africa and Turkey have witnessed a significant rise in exchange rate volatility in recent years, while the exchange rate appears to have become more stable in Algeria.

These trends are further confirmed by decomposing monthly exchange rate changes into different frequencies (Annex Table A2). In most countries, monthly exchange rate changes within the range of $\pm 0.2\%$ are more frequent than say $\pm 2.5\%$ or more. At the same time, the number of instances of monthly exchange rate changes falling between $\pm 2.5\%$ has increased in the more recent period, suggesting movement towards more flexibility. Nevertheless, such instances appear to be less frequent in Asia and several Latin American economies than, for instance, in Chile, Hungary, South Africa and Turkey as well as many industrial economies.

Why do countries limit exchange rate movements?

Authorities may intervene to limit exchange rate movements.¹⁰ However, unlike a fixed exchange rate, such interventions may not target a specific level of the exchange rate but may influence its path or volatility. The arguments for such smoothing tend to focus on special conditions facing emerging economies' financial markets. For example, the tradable sector's capacity to adjust to sudden changes in the exchange rate may be limited. As a result, volatile exchange rates can discourage exporters and importers from international trade.

¹⁰ Since Calvo and Reinhart (2002), many authors have attempted to classify the exchange rate regimes in emerging economies according to the actual behaviour of the exchange rate. For example, according to Levi-Yeyati and Schwarzenegger (2002) the number of de facto fixed exchange rate regimes (or "dirty floats") has remained constant in recent years despite the adoption of a flexible exchange rate regime by many countries. Reinhart and Rogoff (2002) base their de facto classification on parallel exchange market activity and other special characteristics. Based on this classification, they argue that many developing economies have in effect crawling peg regimes rather than floating rates.

Table 1
Exchange rate volatility¹

	Bilateral exchange rate		Nominal effective rate		Real effective rate	
	1991-96	1999-2003	1991-96	1999-2003	1991-96	1999-2003
China	4.0	0.0	3.8	0.7	4.1	1.1
Hong Kong SAR	0.1	0.1	1.4	1.3	1.5	1.4
India	3.1	0.6	2.9	1.3	2.9	1.8
Indonesia	0.2	5.4	1.4	5.2	1.5	5.1
Korea	0.7	1.9	1.3	1.8	1.3	1.8
Malaysia	1.2	0.0	1.3	1.1	1.4	1.1
Philippines	1.4	1.7	1.8	1.8	1.9	1.8
Singapore	0.9	1.1	0.7	0.9	0.8	1.1
Thailand	0.4	1.6	0.9	1.5	1.0	1.6
Argentina	3.7	6.6	4.6	6.6	2.5	5.8
Brazil	11.1	5.3	11.2	5.3	3.0	5.4
Chile	1.6	2.9	2.1	2.4	2.0	2.4
Colombia	2.1	2.2	2.0	4.8	1.9	4.9
Mexico	4.6	1.9	4.9	2.2	5.0	2.2
Peru	3.9	1.0	4.1	1.5	4.2	1.6
Venezuela	6.0	4.6	6.1	4.9	5.6	4.8
Czech Republic ²	1.5	3.1	0.6	1.4	0.7	1.6
Hungary ²	1.5	2.7	1.7	1.4	1.6	1.4
Poland ²	1.1	2.6	1.1	2.4	1.5	2.5
Russia ²	5.2	1.3	6.0	2.3	5.3	2.5
Algeria	4.7	1.8	4.8	1.9	4.8	2.0
Israel	1.8	1.8	1.2	2.2	1.4	2.0
Saudi Arabia	0.0	0.0	1.5	1.4	1.7	1.4
South Africa	1.7	3.9	1.7	3.6	1.7	3.6
Turkey	4.8	5.4	...	...	3.4	5.3

¹ Measured as the standard deviation of monthly changes in the exchange rate; averages over the period. ² First period: 1994-96.

Sources: National data; BIS calculations.

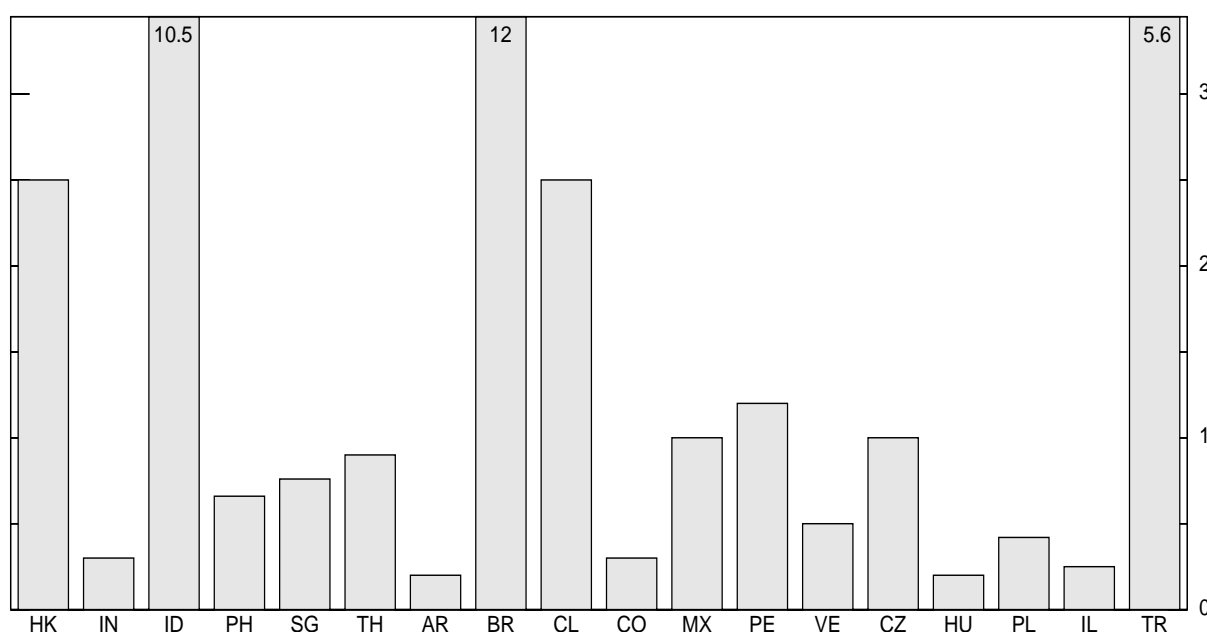
Another reason is currency mismatches, which increase the probability of a sharp fall in exchange rates, exposing banks and the corporate sectors with unhedged foreign currency liabilities to significant balance sheet losses.¹¹ When governments have a large outstanding foreign currency debt or debt indexed to the exchange rate, large currency depreciations can raise questions about fiscal sustainability, increasing risk premia and sovereign spreads. Many participants in the meeting argued that intervention could not be avoided in presence of significant currency mismatches. For instance, liability dollarisation played a special role in the recent Brazilian and Turkish financial crises. Similarly, with three quarters of debt being dominated in dollars, devaluation had strong contractionary

¹¹ Eichengreen (2002) argues that because of their potential adverse implications, the authorities may resist large depreciations but may be willing to absorb modest depreciations.

implications for Peru's economy. In some countries (eg Poland) already weak balance sheets of firms aggravated problems of currency depreciation, requiring central bank intervention.

A further reason is that emerging economies face a high degree of pass-through of exchange rate changes into inflation. This makes them particularly vulnerable to persistent exchange rate depreciations. Graph 1 shows estimates of the pass-through coefficients (over two to four quarters) according to central banks' own estimates. The pass-through coefficient is generally higher in Latin America than in Asia or central Europe. Yet, with the exception of Brazil, Indonesia and Turkey, the coefficients suggest limited influence of the exchange rate on domestic prices.

Graph 1
Exchange rate pass-through¹



¹ Increase in the inflation rate following a 10% depreciation of the exchange rate; estimates consider different periods across countries.

Source: Central banks.

Moreover, some argue that because of their thin markets emerging economies are more vulnerable to one-way expectations and herd behaviour.¹² In such circumstances, the chances of disorderly depreciation are high as firms involved in international trade as well as foreign investors can quickly change their financing strategy in response to an initial depreciation, giving the exchange rate its own momentum. Hungary's recent experience provides an important example.¹³ A rise in inflation above the target in early 2003, combined with the expectation that the authorities would not be able to contain the forint's appreciation within the 15% band, led to a large inflow of speculative capital (€5 billion in two days). To stem currency appreciation, the central bank sharply lowered interest rates and later devalued the central parity of the forint. However, with inflation already high, these measures adversely affected the central bank's credibility to fight inflation, leading, in turn, to large currency depreciation and a subsequent steep hike in the interest rate.

¹² Jalan (2003) points out that in emerging economies "gross" capital flows are the major determinants of the day-to-day movement of the exchange rate, and such flows are more sensitive to herd behaviour.

¹³ See the paper by Kiss in this volume.

A consensus view in the meeting was that intervention could not stop a permanent change in the exchange rate. Since emerging market currency pressures tend to be associated with volatile capital flows, it is necessary to distinguish temporary from permanent capital inflows. For instance, resisting appreciation pressures and building reserves in response to a rise in short-term capital inflows can cushion the economy against volatile exchange rate movements. Nevertheless, this poses several practical challenges to central banks in determining the nature of inflows and the extent to which they are reversible.

Have the factors changed?

How far some of the above factors may have changed in the direction of allowing more tolerance for exchange rate flexibility in emerging economies remains an open question. For instance, to the extent that hedging and forward exchange markets have developed in many countries, exporters and firms with large foreign currency debts may be better able to protect themselves against foreign currency risks. Moreover, the hedging behaviour of firms may be regime dependent: the private sector's incentive to hedge is lower when it believes that the authorities will resist sharp changes in exchange rates; see Eichengreen (2002). Allowing the exchange rate to move both ways can encourage hedging behaviour among firms. For instance, Ortiz (2000) notes that in Mexico the private sector demand for hedging rose significantly as the authorities let the peso move freely and removed restrictions on market participants operating in the forward market. As Table A3 in the annex shows, excepting a few cases, most emerging economies have by now removed restrictions on hedging against foreign currency risks. Moreover, such hedging markets appear to be well developed in a number of economies, particularly Brazil, the Czech Republic, India, Israel, Korea, Mexico, the Philippines and Poland, where swap, forward and option transactions constitute the main hedging instruments (second column of Table A3).

There is some evidence that balance sheet mismatches may have declined in recent years. As a measure of currency mismatch, Table 2 presents the net foreign currency liability (foreign currency liabilities minus assets) of countries according to sectors in 1995 and 2002. With the exception of Brazil, Turkey and central European countries, the net foreign currency liabilities at the aggregate level appear to have fallen in a number of emerging economies. Nevertheless, such liabilities in the non-financial sector including government, corporate and household sectors (the category "others" in Table 2) have either gone up or remained sizeable (for instance, in Brazil, Mexico, Poland, Thailand and Turkey among the countries covered in Table 2). To the extent that unhedged liabilities tend to be concentrated in this sector, balance sheet risks appear to remain high in many countries.

However, some balance sheet mismatches can be reduced by developing domestic bond markets. Such markets can lower the dependence of firms and governments on foreign currency debts and increase their access to long-term funding, helping to reduce both currency and maturity mismatches. Recent trends show a considerable shift in financing pattern of firms and governments in emerging economies towards local bond markets. For instance, the ratio of domestic currency debt to GDP is estimated to have risen from 34% in 2000 to over 60% by the end of 2002 in Asia, and from 26% to about 50% in Latin America. During this period, domestic long-term marketable bonds financed over 55% of fiscal deficits in Asia and about 60% in Latin America, suggesting reduced vulnerability to maturity mismatches.¹⁴ Moreover, prudential regulation of the financial system can be a partial solution to the mismatch problem. For instance, restricting the foreign currency open position of the banking sector can limit some of the adverse systemic implications of large currency depreciations. As Table A3 in the annex shows, most emerging economies currently limit net (or gross) open foreign exchange positions of banks by linking them to their own funds or Tier 1 capital, with ratios ranging from 15% in Mexico and Venezuela to 20% in Indonesia, Korea and Chile, and 30% in Hungary. Hong Kong prescribes limits on individual currency exposures, while Peru sets restrictions on the global position of commercial banks based on their risk-adjusted capital. In countries where customers' mismatches are high, measures to restrict them could also help.

¹⁴ See Mohanty and Scatigna (2003).

Table 2
Net foreign liabilities position¹

	Central bank		Banks and financial institutions		Others		Total	
	1995	2002	1995	2002	1995	2002	1995	2002
Hong Kong SAR	-55.4	-111.9	-34.9	-149.6			-90.3	-261.5
India	-38.3 ²	-48.2	19.5 ²	5.0	101.4 ²	57.2	101.3 ²	58.1
Indonesia	-18.4	-23.8	4.3	-4.3				
Korea	-32.9	-121.7	21.3	8.6	29.3	57.5	17.7	-55.8
Malaysia	-25.1	-34.6	4.1	0.8	29.0	40.8	8	7
Philippines ²		-10.2		-1.7		46.8		35.0
Singapore	-68.5	-81.6	8.9	-15.9			-59.6	-97.5
Thailand	-20.6 ²	-34	1.1 ²	1.5	76.1 ²	78.7	56.6 ²	46.1
Argentina	51.7 ³	64.7 ³	6.37	8.1	-49.1	-85.5	9.0	-12.7
Brazil	-51.5	-19.3	26.2	29.0	175.1	220.5	149.8	230.2
Chile	-18.1	-15.4	1.3	-3.8	48.3	47.2	31.4	28
Colombia	-10.1 ⁴	-11.2	6.0 ⁴	1.7	30.3 ⁴	36.2	26.2 ⁴	26.7
Mexico	1.5	-48	-1	2.8	121.3	128.6	121.8	83.4
Peru	-6.7	-9.6	-0.1	-0.2	27.6	22.2	20.9	12.4
Venezuela	-2.7	2.0						
Czech Republic	-14.2	-23.7	2.9	-4.6	9.1	41.8	-2.2	13.5
Hungary	8	-6	2	4	16	44	26	42
Poland	-15	-30	-3	2	45	100	27	72
Russia	-25 ²	-47	-9 ²	-6	-34 ²	2	-68 ²	-51
Israel			5.6 ²	7.4	43 ²	18.4	48.6 ²	25.8
Saudi Arabia	-53.7	-40.9	-15.5	-13.4	0	0	-69.2	-54.3
South Africa	-3.5	-3.5	9.1	1.7	11.3	11.7	16.9	9.9
Turkey	-2.7	-8.3	-4	2.5	39.5 ⁵	121.1 ⁵	32.8	115.3

¹ In billions of US dollars. ² 2000. ³ Including government. ⁴ 1996. ⁵ Gross.

Source: Central banks.

An additional factor that might increase tolerance for exchange rate flexibility is the decline in the exchange rate pass-through to inflation in some countries. For instance, over a large sample of industrial and emerging economies, Choudhri and Hakura (2001) show that the pass-through is significantly related to the level of the average inflation rate; a 10 % increase in inflation increases the long-run exchange rate pass-through by 0.06. Thus, the recent decline in inflation in many countries may have led to a reduction in the pass-through coefficient.¹⁵ Another factor supporting lower pass-through is the recent shift to inflation targeting, leading to more stable long-run inflation expectations. The increased tendency of firms to absorb exchange rate changes into their profits and to switch to local currency pricing to retain market share may have also played an important role. A flexible exchange rate may also have contributed to lower pass-through in some countries. In the absence of

¹⁵ Similarly, Mihaljek and Klau (2001) report a decline in pass-through coefficient in a number of countries in Asia and Latin America during the 1990s.

significant currency overvaluation, firms are likely to view exchange rate changes as temporary and hence will be more willing to absorb additional costs in their margins.

Yet another explanation attributes recent low pass-through to a much broader global phenomenon. In the past, most transitional economies including China restricted supply, with the global economy experiencing a general excess demand situation. By contrast, the recent movement to market-oriented economies by these countries led to global oversupply, low inflation and reduced pass-through of exchange rate changes into inflation.

At the same time, the extent to which pass-through may remain low is unclear. One factor is that in a number of economies the cyclical influence on pass-through has been strong over the past few years. Large excess capacities have reduced the pricing power of firms, forcing them to absorb a large part of the costs. Such a situation can change as growth recovers and excess capacities disappear. Moreover, country experience suggests that the short-run pass-through can change suddenly in response to large currency depreciations. Brazil is a case in point. A sharp fall in the value of the real against the dollar in 2002 (over 40%) quickly fed into inflation. The historical rate of pass-through of the exchange rate into market prices, which was about 7%, suddenly spiked to 17% by the last quarter of 2002. About 46% of the inflation rate in that year was accounted for by the exchange rate depreciation.¹⁶

4. Implications for monetary policy

An interest rate response

One instrument that countries might use to stabilise the exchange rate is the interest rate. Table A4 in the annex shows major episodes of exchange rate volatility in emerging economies from 2001 up to the middle of 2003 as defined by the central banks. During this period, many countries (notably Brazil, Hungary, Indonesia, Mexico, Peru, the Philippines and Turkey) witnessed several episodes of major exchange rate volatility. A number of them relied on interest rate interventions to stem such volatility. In others, such a response may have been indirectly implied by central banks' reaction to inflation pressures brought about by large exchange rate variations. This was, for instance, seen in South Africa at the beginning of 2002 as well as in Brazil during the second half of that year as both countries raised interest rates sharply to prevent depreciation-led inflation pressures.¹⁷ In contrast, in Asia and central Europe, several countries reduced rates in response to rising appreciation pressures. Both India and Thailand cut interest rates in the second half of 2003, partly to discourage speculative capital inflows. Until the establishment of the special accounts to channel privatisation proceeds, the Czech National Bank had to use its policy rate frequently to stem strong appreciation pressures.¹⁸

In the literature, a standard way to evaluate the role of the exchange rate in interest rate developments is to estimate the central bank's reaction function. Table 3 reports the short-run and long-run responses of the short-term interest rate to its various determinants for a selected group of emerging economies.¹⁹ These estimates provide an indicator of the average relationship between the short-term interest rate, on the one hand, and inflation, the output gap and the changes in the real effective exchange rate, on the other.²⁰ Although the regression estimates pass the standard robustness checks, they may not adequately reflect more recent changes in central bank behaviour. Notwithstanding this caveat, an important finding that emerges from the table is that, with the exception of Chile, the interest rate response to the real exchange rate has been strong in most

¹⁶ See Banco Central Do Brasil (2003).

¹⁷ Both countries eventually missed their inflation targets for 2002.

¹⁸ See the paper by the Czech National Bank in this volume.

¹⁹ This follows Taylor (2001).

²⁰ The model uses quarterly data starting in the early 1990s. The reaction function includes the current and one quarter lagged exchange rate terms to test whether the central bank's response to the exchange rate is temporary or persistent. A statistically significant negative coefficient on both the current and lagged exchange rate term is a sign that central banks do not expect the exchange rate to be mean reverting: see Mohanty and Klau (2004).

emerging economies. The large negative coefficients (an increase represents an appreciation) confirm the findings of other studies that most countries “lean against the wind” in reacting to exchange rate fluctuations.²¹

Table 3
Elasticities from a simple reaction function¹

	Inflation		Output		Exchange rate	
	Short-term	Long-term	Short-term	Long-term	Short-term	Long-term
India	0.13	0.43	0.13	0.43	-0.18	-0.60
Korea	0.66	1.53	0.29	0.67	-0.29	-0.67
Philippines	0.51	0.71	0.35	0.49	-0.09	-0.13
Thailand	0.56	1.33	0.37	0.88	-0.31	-0.74
Brazil	0.08	0.29	0.98	3.50	-0.10	-0.36
Chile	0.97	1.43	0.32	0.47	0.00	0.00
Mexico	0.55	1.10	0.74	1.48	-0.79	-1.58
Peru	0.19	1.36	0.15	1.07	-0.38	-2.71
Czech Republic	0.12	0.75	0.32	2.00	0.03	0.19
Hungary	0.20	0.80	0.35	1.40	-0.15	-0.60
Poland	0.17	0.68	0.66	2.64	-0.05	-0.20
South Africa	0.31	4.40	0.04	2.00	-0.12	-6.00

¹ Based on the open economy Taylor rule specification.

Source: Mohanty and Klau (2003).

Less monetary policy independence?

Does responding to the exchange rate affect the main objectives of monetary policy - namely stabilising inflation and output volatility? To the extent that the exchange rate has significant implications for domestic prices, reacting to currency volatility may not reduce the central bank's control over inflation. The recent success of emerging economies in reducing inflation to a low level might support such an argument. As Table A5 in the annex shows, inflation has been within the target or reference range in most countries during the past three years. This provides some evidence that countries which have contained exchange rate fluctuations have not compromised their inflation objectives in doing so. In contrast, many countries (Brazil, Indonesia, Russia, Turkey and Venezuela) that missed their inflation targets (or the threshold rates) happened to have experienced large currency depreciations. Ho and McCauley (2003) report similar findings over a longer time horizon.

Nevertheless, there are also several arguments for not intervening against exchange rate fluctuations. First, interest rate interventions to resist currency depreciation can lead to significant long-run currency misalignments, disguising latent inflation pressures and increasing the probability of future devaluation. Second, such interventions might increase interest rate volatility, with significant adverse implications for output. Such a finding is generally supported by the estimates of interest rate response shown in Table 3 as well as by other studies. For instance, the estimates reported by Fraga et al

²¹ Among the previous studies with similar conclusions see Filosa (2001) and MAS (2000).

(2003) from a vector autoregression model show that exchange rate shocks explained roughly half of the interest rate forecast errors in Brazil during 1995 and 2002, and over 25% and 35%, respectively, in Korea and South Africa.

Partly because of such diverse implications, the decision to change the interest rate in response to the exchange rate is likely to depend on the weights central banks assign to inflation and output stabilisation objectives. For example, a central bank placing a relatively high weight on output stabilisation may not respond to an exchange rate shock either because it is deemed temporary or because it is prepared to accept the first-round consequences for prices. In some cases, central banks have been prepared to accommodate a temporary deviation of inflation from the target. For example, in 2002 the Central Bank of Brazil allowed much of the first-round effect of the exchange rate to be reflected in prices, although it raised interest rates to check the second-round impacts.

Central banks' response might also depend on the source of the exchange rate shock. Some have argued that central banks should draw a distinction between demand and supply shocks for designing their interest response to the exchange rate: see Ball (1999, 2002). An adverse external demand shock is usually accompanied by a depreciation of the exchange rate that tends to put upward pressure on prices but stimulates exports, partly offsetting the lost output. Therefore, raising rates to stem such depreciation may considerably increase output volatility compared to inflation volatility. On the other hand, an exchange rate depreciation caused by a financial shock (for example, a sudden reversal of capital inflows) is likely to raise both demand and inflation. Raising interest rates against such exchange rate changes could perhaps stabilise both inflation and output.

Persistent exchange rate depreciations might pose a different challenge to central banks. They could result in a sustained period of high interest rates and recession. Yet an inflation targeting framework offers a number of options: targeting a measure of domestic inflation that excludes the effects of the exchange rate;²² adopting a longer target horizon over which inflation can converge to the target; expanding the target range within which inflation can be allowed to move; and targeting inflation over the cycle.²³ The usefulness of each of the alternatives will depend on how they affect inflation expectations. For example, countries where the inflation targeting experience is new and the central bank has not achieved the required credibility may prefer a relatively rigid framework which could help them lower inflation expectations. On the other hand, where such credibility is firmly in place, central banks can afford to be more accommodative to exchange rate shocks.

Another solution to such dilemmas could lie in the use of other policy instruments. For instance, the authorities might use foreign exchange intervention to stabilise the exchange rate, while devoting monetary policy to domestic objectives. In the past, many countries have also resorted to capital account restrictions (or liberalisation) to stem exchange rate pressures. How far does use of such instruments enhance monetary policy independence? The following two sections examine these two options.

5. Foreign exchange intervention

An alternative instrument is direct intervention in the foreign exchange market. A particular aspect of intervention is that a country's ability to resist currency depreciation is limited by its stock of foreign exchange reserves and its access to potential credit lines. Such limitations can be temporarily lowered by forward market intervention, where the central bank commits to deliver foreign exchange at a future date. However, as the experience of East Asia during the 1997-98 crises revealed, the effectiveness of such intervention against speculative currency attacks remains doubtful. It also runs the serious risk of exposing the central bank's balance sheet to any eventual devaluation. As a result, foreign exchange intervention can substitute for interest rate intervention only to a limited extent. Eventually authorities may have to consider raising interest rates. Conversely, a country does not face a rigid limit in accumulating foreign exchange reserves to resist currency appreciations. Nevertheless, creating

²² Ball (1999) argues that this will greatly reduce output volatility at the cost of some increased short-run inflation volatility.

²³ See Ryan and Thomson (2000) who show the relative success of this strategy in Australia.

domestic reserves as a counterpart also brings its own risks and challenges. This will be discussed below.

Recent trends and tactics

As shown by Table A4 in the annex, in recent years, many countries have resorted to foreign exchange intervention during periods of major market volatility, and some (the Czech Republic, Hungary, Indonesia, Peru and the Philippines) combined it with monetary policy measures.²⁴ Graph 2 presents monthly changes in reserves by central banks averaged for various regions during 1999 to 2003. In Asia, central banks have stepped up their net purchases of foreign exchange since 2001. Reflecting this trend, between 2000 and 2003 (up to August), total foreign exchange reserves of non-Japan Asian central banks grew by over \$300 billion, with China, India and Korea accounting for the bulk of the increase. In several cases, central banks also intervened to reduce depreciation pressures: for instance, Korea in March 2003 following increased geopolitical uncertainties, and the Philippines early this year. In central Europe, net reserve changes suggest sporadic interventions by central banks in recent months given that many countries attempted to smooth the market impact of large, one-shot capital inflows. On the other hand, reflecting increased volatility in capital flows, reserve changes have been more volatile in Latin America than in other regions.

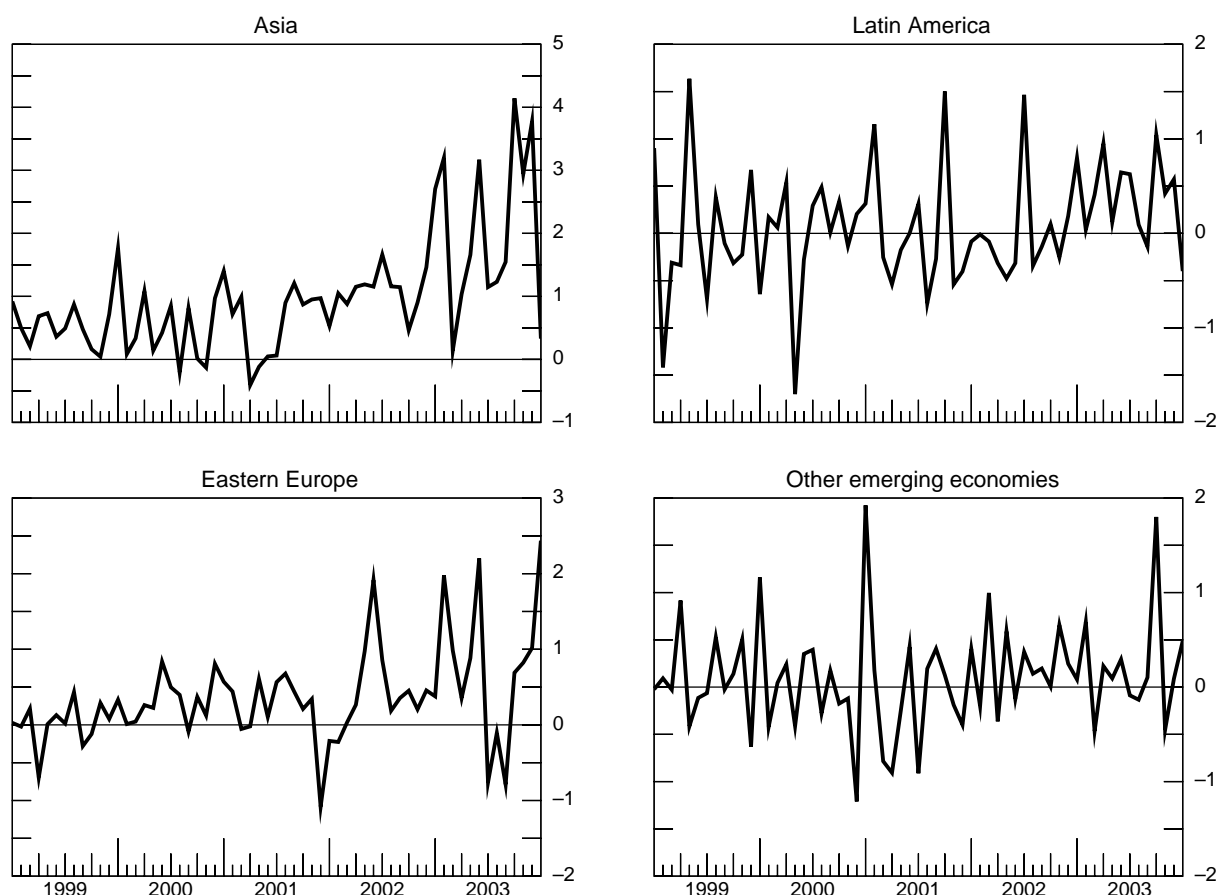
Circumstances leading to intervention have varied across countries. In countries with fixed exchange rates (eg Hong Kong, China, Malaysia and Saudi Arabia) central banks intervened in support of their exchange rate pegs, as large current account surpluses and capital inflows led to upward pressure on currencies. One factor noted by many countries in the meeting was the role of speculative capital inflows in central banks' decision to intervene. In Thailand, although the economy was still recovering, an increase in the expected return on Thai assets encouraged large short-term capital inflows during 2003, leading to central bank intervention and the imposition of controls on non-residents' investment in domestic currency assets. In Saudi Arabia volatility in oil prices was accompanied by exchange rate pressures. In such circumstances, sending a credible signal through intervention was thought necessary to stabilise the foreign exchange market. In some countries (eg the Philippines) a major aim of intervention was to reduce the seasonal gap between demand and supply of foreign exchange. In India, intervention decision was partly guided by the "Dutch disease" syndrome, as software related inflows and remittances have been associated with a general appreciation of the exchange rate.

Yet another factor influencing intervention policy in some countries was the nature of exchange rate volatility. In Brazil, for instance, because the depreciation was expected to be temporary during the early phase of the 2001 crisis, the central bank did not intervene to resist the currency pressure. But with sustained downward pressure on the exchange rate, the authorities decided to intervene through several channels including the interest rate, foreign exchange swaps and dollar-indexed bonds. By contrast, when the currency depreciation in 2002 was triggered by a crisis of confidence in the Brazilian economy, the authorities decided not to intervene in the foreign exchange market, but raised interest rates to a high level.

Regarding the tactics of intervention, most operations in Asia have been through the spot market and foreign exchange swaps. In Latin America the tactics have varied across countries. For example, in Chile the central bank responded to the contagion pressure from Argentina during the third quarter of 2001 by announcing sterilised intervention and increasing the supply of foreign exchange hedging instruments. Brazil responded to heavy exchange rate depreciation pressure in the second half of 2001 by stepping up the issuance of dollar-indexed securities. However, as doubts about the government's capacity to meet its debt obligations made market participants increasingly reluctant to hold such dollar-indexed securities, the central bank announced in July 2002 daily auctions of a fixed amount of foreign currency from its reserves. More recently, the authorities have begun to put more emphasis on local bond financing.

²⁴ In addition, countries may use regular foreign exchange operations to smooth day-to-day exchange rate movements that are not covered by Table A4.

Graph 2
Change in reserves¹



¹ Regional averages; in billions of US dollars.

Sources: IMF; national data.

Some countries have set up automatic mechanisms that might help ease exchange rate pressures. For example, Colombia has introduced a system of put options by which the public can buy (sell) foreign exchange from (to) the central bank if the exchange rate deviates by a certain margin from a moving average for the past few weeks. Such mechanisms might help to contain exchange rate volatility in both directions. Until its discontinuance in July 2001, Mexico operated a similar system for its foreign exchange operations.

Is intervention effective?

The literature has discussed several channels through which foreign exchange interventions might work.²⁵ To the extent that they are not sterilised they can change monetary conditions and hence the current and the expected path of the exchange rate (the monetary channel). Such interventions also imply a change in the relative stock of domestic and foreign assets in investors' portfolio, which can lead to a change in their returns - assuming they are imperfect substitutes - and the exchange rate in turn (the portfolio channel). Moreover, the central bank's intervention in the foreign exchange market could give signals about the future stance of monetary policy. For example, sales of foreign currency

²⁵ For recent reviews see eg Edison (1993) and Dominguez and Frankel (1993).

today might lead traders to expect a tighter monetary policy in future, leading to the appreciation of the spot exchange rate (the signalling channel).

Research has been inconclusive about the effectiveness of foreign exchange intervention in the major industrial countries.²⁶ For example, the Jurgensen Report (1983) analysing the experience of G7 countries in the 1970s, argued that intervention may have a small but transitory effect on the exchange rate. Empirical evidence since then has been mixed and sensitive to the estimation method, time period and intervention strategy. In a recent study, Galati and Melick (2002) show that, while intervention in specific episodes succeeded in changing traders' expectations about the exchange rate, there is no evidence that, on average, intervention on its own had a systematic impact on the exchange rate.²⁷ Suggested reasons include the decline in the size of reserves in industrial economies in relation to market turnover, and regular sterilisation of reserve operations by the central banks.

Empirical studies for the emerging economies are rather scanty. However, some argue that foreign exchange interventions may be more effective in emerging economies than in the industrial economies.²⁸ First, in many countries, the central bank's foreign exchange operations may be large in relation to the total foreign exchange market turnover or interbank trading. Central banks may dominate market activity for several reasons: they act as market-makers, discharge various agency functions for the government, and require the private sector to surrender a part of their exchange earnings. For example, the share of the central bank in total foreign exchange turnover exceeded 9% in Russia in 2000 and 4% in India in 2002, providing some credence to this view. Many countries have also in the past issued exchange rate-linked bonds to influence exchange rate expectations.

Second, foreign exchange interventions are not always sterilised in emerging economies. For instance, to maximise the impact on the exchange rate, central banks may prefer not to sterilise, particularly during speculative currency pressures, while they may be willing to fully or partially sterilise in normal circumstances. This has been demonstrated in many recent episodes of exchange market volatility. In the Philippines, the central bank did not sterilise its foreign exchange sales to avoid infusing liquidity into the market when speculative activities were strong. Similarly, the Central Bank of Chile preferred unsterilised to sterilised intervention during the speculative currency attack on the peso in 1998 because, if unchecked, the depreciation would have raised the inflation rate above the target. Third, some have argued that, because of their great importance and regulatory powers, central banks in emerging economies may possess information advantages over the dealers, which they may use to enhance the effectiveness of their intervention. They may also combine moral suasion (through licensing requirements and supervisory or regulatory powers) with intervention to exert still greater influence on the exchange rate: see Canales-Kriljenko (2003).

Is there a limit to reserve accumulation?

External aspects

A difficult question is whether central banks face a limit to holding reserves. There are both external and domestic implications. One view, based on external considerations, argues that a country's stock of reserves depends on its perceptions about vulnerability. A stylised version of this argument is the early literature on optimal reserves, which viewed central banks' demand for reserves as a stock adjustment process: see Frankel and Jovanovic (1981), Frankel (1983) and Flood and Marion (2001). According to this hypothesis, countries facing higher adjustment costs from an eventual correction to a temporary external disequilibrium would tend to hold higher reserves. But reserves also imply a cost in terms of the return forgone on domestic assets. Hence an optimal choice involves a trade-off between the benefits from and the costs of reserve accumulation.

²⁶ For recent surveys, see Sarno and Taylor (2001) and Galati and Melick (2002).

²⁷ A notable exception is Ito (2002), who argues that recent foreign exchange intervention in Japan has had a strong impact on the exchange rate, presumably reflecting the effectiveness of the signalling channel. Similarly, Fatum and Hutchison (2003) find statistical evidence of a positive short-run impact of intervention on the Deutsche mark/dollar exchange rate during 1985 to 1995. They argue that such intervention may have worked not only through the usual signalling channel, but also by conveying central banks' views on economic fundamentals.

²⁸ See eg Canales-Kriljenko (2003).

Some argue that perceived adjustment costs facing emerging economies may have gone up with their growing global financial integration. Such a perception may have been further strengthened by the increased frequency of emerging market crises in recent years and the associated large output losses. Others argue that, as emerging economies have limited and only conditional access to the international capital market, they are likely to hold large precautionary reserves as an insurance against future negative shocks.²⁹ Yet another factor could be the recent trend among rating agencies and foreign investors to associate a country's solvency with its reserve holding - higher reserves then reduce a country's credit risk premium. For example, Mexico's reserve accumulation policy during 1996-2000 seemed to have been influenced by investors' perception about sovereign risk.³⁰ Other country-specific factors might also play a role. In India, for instance, reserve management objectives reflect considerations such as minimising foreign exchange "liquidity risks" and exposure to unanticipated events.³¹ The Reserve Bank of India therefore monitors a wide range of indicators, including the current account balance, short-term external liabilities and volatility of capital flows in deciding the level of reserves it wishes to hold.

There is, nevertheless, very little agreement about the optimal level of reserves for a country. It would also depend on whether reserve accumulation reflects the objective of reducing external vulnerability or containing exchange rate movements. In the former case, the central bank's demand for reserves is expected to decline as reserves rise in relation to certain vulnerability indicators. As an illustration, Table 4 compares the standard reserve adequacy indicators of countries between 1996 and 2003. All indicators have shown significant improvements in Asia. For instance, the ratio of short-term debt (less than one-year residual maturity) to reserves, which played a major role in the 1997-98 financial crisis, has fallen sharply in all countries in the region. This is also true for the ratio of total international debt and bank liabilities to the BIS reporting banks to reserves. In contrast, notwithstanding some reduction, such ratios have remained at a higher level in Latin America or central Europe than in Asia.

It is much harder to define reserve adequacy levels when the objective is to contain exchange rate volatility. In principle, countries allowing their exchange rates to vary freely do not need to hold large reserves. In practice, the demand for reserves seems to be negatively related to the degree of exchange rate flexibility desired. A general view among central banks is that holding some reserves is optimal under a managed floating regime. Such optimality considerations, it is argued, need to balance several economic considerations. While a faster rate of currency appreciation could generate expectations of future appreciation, low long-term interest rates and overheating of the economy, intervention to hold down the exchange rate at a low level could lead to an overexpansion of the tradable sector and a build-up of excess capacity in the long run.

Another factor with significant implications for central banks' optimal reserve holding is their role in some countries as the lender of last resort in the foreign exchange market. For instance, following the 1995 crisis, under the constant threat of a bank run, the central bank of Mexico often played the role of the lender of last resort in dollars. The government boosted foreign exchange reserves by issuing \$30 billion of dollar-denominated bonds (so called "tesobonos"). As amortisation of tesobonos put pressure on the exchange rate, the central bank sold option contracts to repay these bonds. Similarly, although Israel follows a free floating regime, the central bank holds a significant amount of reserves partly because of its legal obligation to provide foreign exchange to the government as well as to play the lender of last resort role in the foreign exchange market.

²⁹ For instance, Aizenman and Marion (2003) argue that Asian countries' demand for reserves has been led by a greater degree of loss aversion of the official and private sector after the 1997-98 crises.

³⁰ See the paper by Sidaoui in this volume.

³¹ See the paper by Mohan in this volume.

Table 4
Reserve adequacy indicators

	Forex reserves/imports ¹		Forex reserves/M2		Short-term debt/reserves ²		Total debt/reserves ³	
	1996	2003	1996	2003	1996	2003	1996	2003
China	9	22	11	13	27	9	65	20
Hong Kong SAR	4	13	19	23	272	61	352	126
India	6	29	11	21	38	21	107	43
Indonesia	5	24	14	29	197	41	343	95
Korea	3	18	6	17	222	41	425	99
Malaysia	4	11	28	34	44	29	121	129
Philippines	4	8	21	29	82	80	189	338
Singapore	7	17	80	77	229	69	249	128
Thailand	6	13	25	28	125	26	215	70
Argentina	9	23	29	29	167	221	418	1045
Brazil	13	25	31	35	90	84	165	275
Chile	11	21	58	52	53	74	123	230
Colombia	8	18	48	43	70	37	215	210
Mexico	3	8	13	16	167	65	507	239
Peru	16	29	76	54	60	62	76	134
Venezuela	13	34	89	65	32	25	118	183
Czech Republic	5	13	31	40	38	22	83	80
Hungary	7	6	46	30	59	106	260	395
Poland	7	16	36	37	14	39	46	163
Russia	2	21	16	47	235	42	518	123
Israel	5	18	14	21	18	24	61	93
Saudi Arabia	6	8	19	15	46	72	59	97
South Africa	0	5	1	6	1234	159	2210	493
Turkey	5	11	25	29	80	79	211	214

¹ Months of imports. ² International debt securities and liabilities to BIS reporting banks with a maturity of less than one year, as a percentage of foreign exchange reserves. ³ International debt securities and liabilities to BIS reporting banks, all maturities, as a percentage of foreign exchange reserves.

Sources: IMF, *International Financial Statistics*; BIS statistics.

Domestic aspects

As reserves rise, their domestic implications tend to attract more attention. Such implications are likely to be felt in pressures for sterilising reserve purchases as well as in macroeconomic variables.³² In Asia, reserves have been growing at a particularly rapid rate during the past three years, with reserves now accounting for many times the monetary base (Annex Table A6). To the extent that large increases in foreign reserves are unsterilised they could lead to an undesirable expansion in the monetary base and a loss of monetary control. Even though nominal appreciation has been successfully resisted, the real exchange rate would then eventually appreciate as growing capital inflows and higher monetary growth raise aggregate demand and inflation.³³

³² See McCauley (2003) for a review of the domestic implications of reserves.

³³ In an operational sense, however, there may be little difference between sterilised and unsterilised intervention for managing liquidity when central banks target an overnight interest rate. For instance, on any given day, while foreign

Table 5

**Monetary and credit aggregates:
growth in excess of nominal GDP¹**

	Reserve money			Domestic credit to the private sector		
	2001	2002	2003	2001	2002	2003
China	0.2	9.3	7.1	0.8	10.2	10.0
Hong Kong SAR	7.5	9.3	18.7	1.4	-0.9	-3.0
India	0.9	1.1	2.1	5.5	8.6	-1.9
Indonesia	0.2	-1.5	1.9	1.8	0.2	6.6
Korea	8.4	2.5	0.9	8.8	8.1	2.3
Malaysia	5.6	-2.8	0.8	8.6	-2.9	-0.5
Philippines	-19.0	4.8	2.1	-6.5	-11.5	-1.9
Singapore	7.2	1.7	2.0	15.9	-3.2	4.0
Thailand	6.4	-10.1	17.2	-10.8	-7.2	-4.5
Argentina	21.2	22.2	49.1	-5.2	-27.0	-24.0
Brazil	3.3	60.4	-12.8	4.0	-2.8	3.3
Chile	5.9	4.4	-8.0	2.9	-0.7	-0.0
Colombia	4.6	12.8	6.4	1.8	2.9	-0.2
Mexico	8.4	15.9	11.1	-2.9	-2.3	-1.3
Peru	1.3	3.2	-11.5	-2.5	-6.6	-10.0
Venezuela	4.7	-15.0	28.2	10.9	-11.9	-3.8
Czech Republic	-1.6	7.3	4.6	-12.8	-29.8	5.2
Hungary	-13.6	-0.3	2.4	10.4	7.8	24.0
Poland	5.7	3.9	2.4	5.5	2.4	2.2
Russia	7.9	8.8	28.8	26.9	16.0	20.9
Israel	6.7	-17.2	-9.1	11.8	9.4	-5.4
Saudi Arabia	5.9	1.5	0.6	14.2	9.6	6.2
South Africa	12.4	33.0	-36.9	-0.8	-2.5	9.3
Turkey	27.2	-17.5	-20.7	-3.3	-32.2	9.4

¹ Rates of growth relative to the growth in nominal GDP; average values.

Sources: © Consensus Economics; IMF; national data.

However, focusing on the recent experience, it is hard to find evidence that reserve accretion has led to high monetary expansion (Table 5). With the exception of China, in most Asian economies base money and domestic credit growth, adjusted for GDP growth, have either fallen or decelerated during 2001 and 2003.³⁴ This is also confirmed by the estimates of the degree of sterilisation presented in Annex Table A7. In Asia, for example, the long-run elasticity of changes in domestic assets to changes in net foreign assets is negative and statistically significant in many countries, suggesting a high degree of sterilisation of reserve accumulation. In Latin America, on the other hand, base money grew at a relatively faster rate in Argentina, Brazil, Mexico and Venezuela. However, the weak and, in some

exchange purchases may add to the flow of autonomous liquidity, they may be offset by a reduction in other sources of liquidity such as an increase in government cash surpluses with the central bank: see Borio (1997).

³⁴ It is not clear whether the recent sharp increase in monetary growth in China has been due to supply side factors as commercial banks held large excess reserves with the central banks. The role of other factors such as high demand for credit and administrative measures encouraging banks to lend also appear to have played an important role.

cases, statistically implausible relationship between domestic credit and reserves suggests that reserve changes may not have been a primary source of monetary expansion.³⁵

Nevertheless, rapid reserve growth could yet raise several potential challenges for the central bank. First, continuous accumulation of reserves might at some point raise problems for the central bank in controlling monetary growth even though many countries have so far been successful in sterilising reserve operations. One such plausible scenario would be a sustained pickup in demand and inflation, requiring the central bank to tighten monetary policy. Reining in excess liquidity in the banking system might then become more difficult.

Second, perceptions that such reserve accumulation is not sustainable may generate expectations of future currency appreciation, leading to a sharp decline in long-term interest rates and excessive easing of monetary and credit conditions.³⁶ Moreover, such expected appreciation can encourage large unhedged foreign currency borrowing by the private sector, exposing it to future depreciation. For example, the appreciation of the rupee and a sharp decline in the forward premium on the dollar in India has led many companies to undertake unhedged external borrowing. To curb this, the Reserve Bank of India has recently required the corporate sector to hedge its foreign currency borrowing beyond a certain amount. Furthermore, the rapid expansion of domestic credit associated with reserve expansion can lead to an unsustainable rise in equity or real estate prices, with adverse implications for the financial system. China's recent experience provides an example. A large overhang of liquidity in 2003 was associated with rapid expansion in bank credit to the real estate sector and faster growth in property prices.³⁷ To curtail such lending, the People's Bank of China raised reserve requirements and lowered the loan-to-value ratio for mortgage loans.

Third, another potential challenge could arise if rising reserves created a shortage of instruments for sterilisation operations. Currently various instruments are in use: starting from short-term foreign exchange swaps and reverse repos to government bonds and central bank bills. In Hungary, the central bank has introduced a special deposit facility for banks as a sterilisation instrument. To overcome such shortage of instruments, China, Indonesia and Thailand have issued their own bills, while the Bank of Korea issues the so-called "monetary stabilisation bonds". In Poland, the central bank converted non-marketable bonds in its portfolio into marketable paper to meet higher sterilisation requirements. In Russia, legal problems in issuing its own bills has led the central bank to use reverse repo operations to drain short-term liquidity. In India, since the beginning of 2004 the government has issued bonds under a special monetary stabilisation scheme to enable the central bank to sterilise its foreign exchange intervention.

Fourth, high levels of reserves could also have wider macroeconomic implications. To the extent that reserve accumulation in Asia reflects cyclical conditions, they may be self-correcting as investment recovers in the future. According to this view, by holding reserves countries tend to smooth consumption and investment over the cycle. But when such reserves reflect deeper structural imbalances between domestic saving and investment they have longer-term implications for growth. Moreover, McCauley (2003) notes that such domestic implications are even likely to extend to the political economy sphere as high levels of reserves create the impression of a "wealthy" government, leading to expansion of domestic spending.

Fifth, high levels of reserves also have implications for the central bank's balance sheet. A well recognised impact is the carrying cost of reserves, which rises if central banks sell domestic high-yielding bonds in lieu of foreign assets. Such costs are determined by the difference between the return on domestic assets and foreign assets. Table A9 in the annex reports the average return of central banks on their foreign and domestic assets. In Chile, Hungary, Israel and Korea, the central bank's return on domestic assets is lower than that on foreign assets, implying that on an average reserve holdings produced a net return to the central bank. Based on the average returns, Graph 3

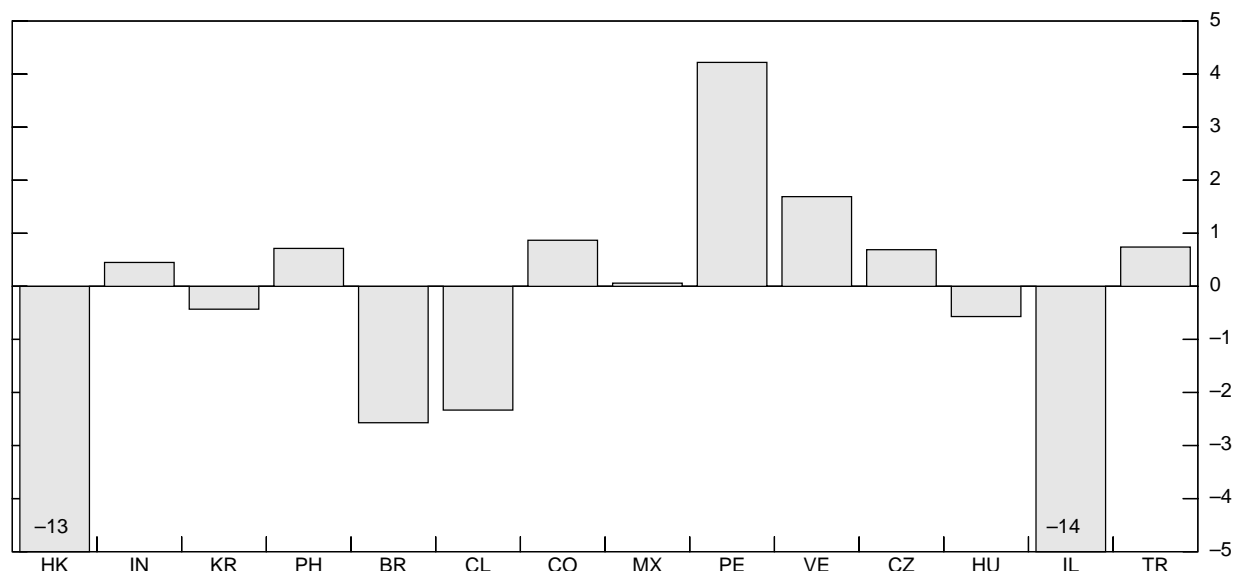
³⁵ Excepting Argentina and Mexico, the coefficients are statistically insignificant, implying that the hypothesis of zero values cannot be rejected. This also appears to be the case in many other countries in Table A7.

³⁶ For instance, in 2003 long-term interest rates in many Asian countries (eg China, Singapore and Thailand) fell below that in the United States.

³⁷ McCauley (2003) notes other reasons for rapid credit growth in China: the past overhang of excess liquidity, incentives for bank managers to reduce non-performing loans by extending new loans, decentralisation of lending projects and pressures on banks to lend.

presents one estimate of the cost of sterilisation as a percentage of GDP in 2002. Excepting Peru and Venezuela such costs appear to be low, especially in Asia, where reserve accumulation has been relatively faster.³⁸

Graph 3
Cost of sterilisation¹



¹ Calculated as the spread between domestic and foreign asset returns applied to the foreign assets outstanding denominated in domestic currency; as a percentage of GDP.

Sources: Central banks; BIS calculations.

There could also be other potential and actual costs implied by large reserves. For example, by accumulating reserves, central banks are exposed to substantial currency and maturity mismatches. While a large part of their foreign assets tend to be invested in long-term paper, their liabilities are usually shortened by large and frequent issuance of their own bills to sterilise reserve purchases. Moreover, to the extent that large foreign exchange reserves imply considerable negative valuation changes due to continuous appreciation of the domestic currency, this exposes the central bank to significant currency risks. This has the effect of transferring a large part of the currency risk in the private sector to the central bank.³⁹

6. The role of capital account policies

Capital outflow regulations

Although not a very popular form of intervention, some attention has, nevertheless, been paid recently to using capital account policies to enhance monetary policy independence. For instance, many countries in the more distant past used restrictions on capital outflows, either as a preventive or crisis-time measure, to lower interest rates and revive growth. The objective behind such restrictions was to create a systematic wedge between domestic and foreign interest rates. As the uncovered interest

³⁸ However, at the margin, the cost of sterilisation would depend on the difference between the foreign and domestic interest rate at a given point in time. Given that the domestic interest rate differentials (when compared to dollar paper) in many countries have been positive, the carrying costs of reserves at market interest rate appear to remain significant.

³⁹ On the other hand, some have argued that such cost calculations do not adequately reflect the positive welfare implications of reserves due to greater external stability.

rate parity condition broke down, the authorities could regain control both of the interest rate and of the exchange rate.

However, as Table A10 in the annex shows, most countries have by now either abolished outright controls on outflows or substantially diluted them. In contrast, China, India and Malaysia maintain relatively tight restrictions on outflows by residents. In Thailand and Korea, corporate lending in foreign currency is either limited or requires prior approval; in Chile, Hungary, Peru, Russia and Turkey financial institutions' overseas investments are subject to certain regulations, and in Poland investment by residents in overseas real estate is restricted.

A first reason for the reduced reliance on capital outflow restrictions is their high cost of maintenance and reduced effectiveness due to increased trade and financial liberalisation.⁴⁰ Second, the growing importance of foreign investment has led to liberalisation of capital outflows in the non-residents account. In such circumstances, preventing resident outflows alone might not be effective in gaining control over the exchange rate. In particular, the growing role of FDI in emerging economies has blurred the distinction between resident and non-resident transactions. Third, in many countries, the challenges for the authorities may have shifted from containing depreciation to reducing appreciation. In such an environment, asymmetric capital account policies that encourage inflows and limit outflows can complicate exchange rate management. Japan's experience in the late 1970s provides a case in point; see Fukao (2003). Capital export controls prevented the private sector from investing its large export surpluses abroad, leading to strong buying pressure on the yen. The Bank of Japan's passive intervention could not prevent substantial yen appreciation. At the same time, a more active intervention by the Bank raised the risk of giving investors a one-way option on the yen, increasing the possibility of further appreciation. Upward pressure on the yen did not ease until the liberalisation of capital restrictions by the Japanese authorities in the early 1980s.

Recently such appreciation pressures have led China and India to encourage capital outflows. In the former, the authorities have responded by liberalising outflow restrictions, including relaxation of merchandise imports and residents' overseas travel restrictions. Domestic companies and banks have been given greater flexibility to issue foreign currency denominated bonds in local markets and raise their direct overseas investment. Similarly, India recently liberalised foreign portfolio and direct investment by residents and allowed the corporate sector to prepay its external debts.

Anti-speculative controls

A second type of control aims at discouraging speculative transactions by restricting non-residents' access to domestic currency. The idea behind such restrictions is to reduce the potential for "shorting" the domestic currency. In the absence of controls, the offshore interest rate for domestic currency lending is expected to equal to the domestic money market rate. An expectation of depreciation could lead investors to borrow domestic currency to buy dollars, and once the exchange rate has fallen to sell dollars and book a profit. On the other hand, when non-resident borrowing of domestic currency is restricted, offshore interest rates are likely to rise with the borrowing pressure, thus reducing the scope for speculative currency attacks. An often cited example of this type of control has been the experience of Malaysia during the 1997-98 Asian crisis. Faced with growing speculative currency pressures, Malaysia fixed its exchange rate in September 1998, banned offshore trading of the ringgit and temporarily suspended repatriation of profits on foreign investment. This subsequently allowed the authorities to lower the domestic interest rate and ease fiscal policy. As Table A10 in the annex shows, notwithstanding the exchange rate regime, many countries (notably China, India, Indonesia, Korea, the Philippines, Poland and Thailand) have restricted non-resident borrowing of domestic currency to prevent currency speculation.

How far such controls are desirable remains an open issue. One view is that emerging economies' financial markets are rather thin and vulnerable to swings in investors' sentiment. In such

⁴⁰ Some of the much highlighted costs of controls on capital outflows are that they lead to a sub-optimal policy by reducing incentives for major reforms, thus increasing the chance of an eventual financial crisis; reduce investment opportunities for residents and encourage inefficient capital use; imply large implementation costs; and increase the scope for corruption; see eg Edwards (1999), Eichengreen (2001) and Fisher (1998) on costs and benefits of capital controls. At the same time, information and technology developments and increasing use of disguised current account transactions (particularly under-invoicing of exports and over-invoicing of imports) have led to large-scale evasion of controls, rendering them less effective over time.

circumstances, prudential controls on outflows could cushion some of the potential adverse effects.⁴¹ Others emphasise the beneficial impact of controls as offering a temporary payments standstill in the absence of a lender of last resort in the international capital markets: see Rogoff (1999).⁴² A counter view attributes emerging economies' currency crises to weak regulation of financial systems and domestic imbalances, which capital controls help to maintain.⁴³ Moreover, such controls may not be effective if currency speculators access the large offshore banking centre or use sophisticated financial markets to evade them.

Such controls can also affect financial market development. For instance, while Singapore dismantled most controls on capital movements long ago, it restricted non-residents' ability to borrow in Singapore dollars and to participate in interbank derivative transactions. This discouraged speculative currency trading and contributed to enhancing monetary control through the exchange rate instrument. Nevertheless, as Tee (2003) notes, such restrictions implied significant cost to the economy by adversely affecting capital market liquidity and the development of a domestic bond market, leading to significant relaxation in recent years.⁴⁴

Controls on inflows

Some countries may restrict capital inflows rather than outflows to reduce their vulnerability to external shocks. Such controls may tax short-term inflows which are thought to be speculative and hence more reversible in nature. The Chilean reserve requirement on capital inflows is often cited. It was said to have discouraged short-term inflows and attracted stable long-term inflows. Although evidence is inconclusive about whether the tax had a significant impact on the real exchange rate, it seemed to have helped the conduct of an independent monetary policy. But recent evidence suggests that such inflow restrictions may also have led to an adverse impact particularly on small firms, which faced a high risk premium on their borrowings. In addition, the general effectiveness of the tax has also been questioned because of its leakage.⁴⁵ Another argument against the use of reserve requirements is that they may increase the risk premium on long-term borrowing for some countries as investors might be less willing to take a long position on their assets.⁴⁶

Not many countries currently differentiate between domestic and foreign liabilities of the banking system for the purposes of reserve requirements, although a number of them use other restrictions which may work in a similar way to the Chilean tax (Annex Table A11). Argentina has introduced a minimum holding period for capital inflows through the banking system, which will effectively discourage short-term inflows. In Colombia, although the central bank can ask that a certain percentage of capital inflows be held with it, without remuneration, the ratio is currently set to zero. Some countries discourage short-term inflows through a differential tax treatment (Colombia) or by limiting the maturity for which non-residents can maintain foreign currency deposits (India).

However, many countries restrict non-resident investment in government securities (eg China, Colombia, India and Poland), and some restrict domestic currency lending by non-residents to residents. For example, to restrict short-term inflows, Thailand announced a number of restrictions on non-resident transactions in 2003. While domestic banks were not allowed to borrow from non-residents beyond 50 million baht, restrictions were placed on non-residents' baht deposits in the banking system. By limiting investment vehicles, such restrictions discourage non-residents from speculating on the future value of the domestic currency.

⁴¹ See Cooper (1998) and Obstfeld (1998).

⁴² Some recent studies suggest a positive impact of capital controls on Malaysia's recovery from the 1997-98 crisis by helping it to pursue expansionary demand policies and removing financial uncertainty for domestic investors, although evidence is far from conclusive about the effectiveness of such controls: see Kaplan and Rodrik (2001).

⁴³ Some argue that the imposition of capital controls can lead to unsuccessful devaluation since it restricts the real exchange rate correction necessary to correct balance of payments imbalances; see Edwards (1999).

⁴⁴ Two major restrictions that still remain are: financial institutions cannot lend to non-residents beyond SGD 5 million where such credits may be used for speculative purposes, and any borrowing by non-residents beyond SGD 5 million and proceeds of all equity or bond issuance have to be swapped into foreign currency before repatriation; see Tee (2003).

⁴⁵ See Edwards (1999) and Forbes (2003) for recent reviews on the Chilean tax on capital inflows.

⁴⁶ See Rogoff (1999).

Table A1

Monetary and exchange rate regime

	Exchange rate regime		Monetary framework		Authority managing the exchange rate	Most important exchange rate indicator
	1997	2002	1997	2002		
China	Fixed peg				CB and SAFE ¹	Real effective
Hong Kong SAR	Currency board				HKMA ²	Nominal bilateral
India	Managed floating	Managed floating	MT	Multiple indicators	CB	Nominal bilateral, real and nominal effective
Indonesia	Managed floating	Managed floating	MT	IT	CB	Nominal bilateral, real and real effective
Korea	Floating	Floating	MT	IT	Ministry of finance and CB	Nominal bilateral
Malaysia	Fixed peg				CB	Nominal and real bilateral; real and nominal effective
Philippines	Managed floating	Floating	MT	IT	CB	Nominal bilateral and real effective
Singapore	Exchange rate as an intermediate target				MAS	Nominal effective
Thailand		Managed floating		IT	CB	Nominal and real effective
Argentina	Currency board	Floating	Currency board	IMF program	CB	
Brazil	Managed floating	Floating	Exchange rate target	IT	CB and National Monetary Council	Nominal bilateral
Chile	Crawling band	Floating	IT	IT	CB	Both nominal bilateral and real effective
Colombia	Crawling band	Floating	IT	IT	CB	Last 20-day moving average of nominal bilateral
Mexico	Floating	Floating		IT	Foreign Exchange Commission ³	Nominal bilateral
Peru	Floating	Floating	MT	IT	CB	Nominal bilateral and real and nominal effective
Venezuela	Crawling bands	Fixed ⁴	Exchange rate target	Exchange rate target ⁴	CB and Ministry of Finance	Real effective
Czech Republic	Managed floating	Floating	MT	IT	CB	Nominal and real
Hungary	Crawling bands	Horizontal band		IT	Government	Nominal bilateral

Table A1 (cont)

Monetary and exchange rate regime

	Exchange rate regime		Monetary framework		Authority managing the exchange rate	Most important exchange rate indicator
Poland	Crawling bands	Floating	MT	IT	Monetary Policy Council, Council of Ministers and CB	Nominal bilateral
Russia					CB and Federation Government	Nominal bilateral
Israel	Crawling band	Crawling band	IT	IT	Ministry of finance	Nominal bilateral
Saudi Arabia	Fixed peg				CB and Government	Nominal and real effective
South Africa	Floating	Floating	MT	IT		
Turkey	Managed floating	Floating	IMF program			

Note: MT = monetary targeting; IT = inflation targeting.

¹ State Administration of Foreign Exchange. ² The Hong Kong Monetary Authority is responsible for the management of the Exchange Fund, which is controlled by the Financial Secretary. ³ Presided by the Secretary of Finance and Public Credit. ⁴ Since January 2003.

Sources: IMF; central banks; national data.

Table A2
Volatility distribution¹

	1991-96			1999-2003		
	From zero to two	Between two and five	Greater than five	From zero to two	Between two and five	Greater than five
China	70	1	1	60	0	0
Hong Kong SAR	72	0	0	60	0	0
India	59	9	4	59	0	0
Indonesia	72	0	0	28	17	15
Korea	70	2	0	41	19	0
Malaysia	67	4	1	60	0	0
Philippines	62	10	0	46	13	1
Singapore	70	2	0	56	4	0
Thailand	72	0	0	48	12	0
Argentina	69	1	2	46	6	8
Brazil	24	5	43	22	21	17
Chile	62	9	1	28	29	3
Colombia	62	8	1	40	16	4
Mexico	59	5	8	41	19	0
Peru	41	20	9	58	2	0
Venezuela	45	19	8	48	3	9
Czech Republic	54	16	2	34	19	7
Hungary	51	19	2	29	29	2
Poland	53	14	5	38	17	5
Russia	19	15	38	51	7	2
Israel	58	12	2	44	15	1
South Africa	58	13	1	31	23	6
Turkey	6	41	24	16	24	20
Saudi Arabia	72	0	0	60	0	0
<i>Memo:</i>						
Australia	58	14	0	30	28	2
Canada	69	3	0	52	6	1
Euro area	40	28	3	33	25	1
Japan	47	20	5	33	24	2
New Zealand	61	11	0	28	26	6
United Kingdom	52	15	5	47	13	0
United States	41	27	4	34	24	1

¹ Number of occurrences, in monthly percentage changes.

Sources: National data; BIS calculations.

Table A3

Foreign currency exposure and hedging market

	Limits on banks' open positions	Market for hedging	Restrictions on hedging
China	None	Forward transactions within one year can be used to hedge import/export positions.	Proceeds from imports and exports can be hedged through the main four state-owned banks only.
Hong Kong SAR	5% of the capital base for the net overnight position and 10% of capital base for each currency denominated position. Additional specific requirements.	Well developed. Interest rate and currency swaps plus FX spot and forward are available.	None
India	Net open positions are limited according to Tier 1 and 2 capital.	Well developed, FX swaps, forwards and options available.	
Indonesia	Net open position must not exceed 20% of bank's capital.	Developing market, mainly swap and forward.	Banks cannot maintain derivatives exposures.
Korea	20% of the capital for net open position.	Well developed; options, futures and swaps are available.	None
Malaysia	Yes	Forward and currency options are the most used.	Authorised dealers are freely allowed to enter forward transactions while other residents need permission.
Philippines	Bank's long forex position may not exceed 5% of its unimpaired capital or the equivalent of USD 10 million.	Forwards, swaps and options are increasingly being used.	Derivatives transactions can be operated only by authorised intermediaries.
Singapore	None	The market for forex and derivatives is increasingly developing.	Not applicable
Thailand		Forwards, FX swaps, cross currency swaps, interest rate swaps and options are available.	None
Argentina	10% of the computable equity liability recorded by an entity as of 30 November 2001.	Limited hedging is possible.	Forward transactions must be authorised by the central bank unless operated in regulated markets.
Brazil	Banks: forex position beyond USD 6 million to be deposited with the CB; total exposure cannot exceed 30% of each bank's base capital. Licensed dealers: long exchange position maximum USD 500,000 and no short position is allowed.	Well developed market; forwards, USD futures, options on cash USD and options on USD futures are available.	None

Table A3 (cont)

Foreign currency exposure and hedging market

	Limits on banks' open positions	Market for hedging	Restrictions on hedging
Chile	20% of Tier 1 capital for net open positions.	Forwards, currency and cross currency swaps with maturity of less than one year are available.	Institutional investors only in formal market. Pension funds cannot operate in swaps and banks cannot issue options.
Colombia		Growing.	Non-residents cannot buy derivatives.
Mexico	15% of Tier 1 capital for net open position.	Well developed; futures on USD, interbank and corporate bank USD swaps and forwards and futures on Mexican pesos available.	None
Peru	Net global position of commercial banks varies within a limit.	Only forward market is developed (about 2% of GDP).	None
Venezuela	Net open position must not exceed 15%.	There is no market to hedge currency risk with institutional financial derivatives.	Capital flows restrictions an obstacle for currency risk natural hedging.
Czech Republic	Limit on the net open position.	Well developed; all instruments available.	None
Hungary	30% of own funds for the net open position.	After 2001 forex liberalisation, the market is developing faster; main contracts available.	None
Poland	None	FX swap market well developed and forwards and options also available.	None
Russia	20% of bank's own funds for net open currency position and, on each currency, 10% of the authorised bank's funds.	Futures market available but still not developed; OTC forwards and options also allowed.	
Israel	None	Well developed; options, FRA and OTC are available.	None
Turkey	20% of own funds for the net open position.	Forwards and swaps are the main contracts used.	For forward transactions the amount must be transferred through a bank operating in Turkey.
Saudi Arabia	None	Mostly forwards and options.	None
South Africa	10% of net qualifying capital plus reserves.	Main instruments are available.	Forward exchange cover can be provided only for authorised trade and non-trade transactions.

Source: Central banks.

Table A4

Recent experience in containing exchange rate volatility

	Volatility episodes	Policy rate change	Intervention in forex market	Use of capital controls	Other instruments used
China					
Hong Kong SAR					
India	None				
Indonesia	Jan-Jun 2001	Yes	Yes	Yes	Onsite/offsite supervision of domestic banks.
	Jul-Aug 2001	No	No	Yes	None
	Sep-Oct 2001	No	Yes	Yes	Onsite/offsite supervision.
	Nov 2001-Jun 2002	Yes	No	Yes	None
Korea	Mar-Apr 2001	No	Yes	No	None
	Mar 2003				
Philippines	1 Jan 2001	Yes	Yes	No	The currency rate risk protection programme was expanded.
	2 Jul-Aug 2001	No			Increase in the liquidity reserve requirements and improvements in the forex operation rules.
	3 Mar 2003	No			
	4 Jul 2003	Yes			
Singapore	Following Sep 11 2001				Additional injection of liquidity.
Thailand	15 Jul 2002	No	Yes	No	Sell/buy swaps in offshore markets.
Argentina	Jan 2002	No	Yes	Yes	
Brazil	Mar-Sep 2001	Yes	Yes	No	Issuance of dollar-linked securities.
	Apr 2002-Apr 2003	Yes	Yes	No	
Chile	16 Aug-31 Dec 2001	No	Yes	No	Sterilised issuance.
	10 Oct 2002-Feb 2003		No		
Colombia	Aug 2001	No	Yes	No	
Mexico	6-17 May 2002	No	No	No	None
	22 Jan-17 Feb 2003				Change of operative instruments.
	5-19 May 2003				None
Peru	9-26 Apr 2001	Yes	Yes	No	None
	28-31 May 2001	Yes	Yes		None
	31 Jul-1 Aug 2002	Yes	No		None
	3 Sep-4 Oct 2002	Yes	Yes		Yes
	6-29 Nov 2002	No	No		None
Venezuela	Feb 2002	No	No	No	Adoption of floating regime.
	Mar 2002		Yes	No	
	May-Jun 2002		Yes	No	
	Dec 2002-Jan 2003		Yes	Yes	Adoption of fixed regime.
Czech Republic	Q4 2001-Jul 2002	Yes	Yes	No	None ¹

Table A4 (cont)

Recent experience in containing exchange rate volatility

	Volatility episodes	Policy rate change	Intervention in forex market	Use of capital controls	Other instruments used
Hungary	Aug 2001 Jan 2003 Jun 2003	No Yes Yes	No Yes No	No	None Temporary unsterilised intervention. None
Russia	None				
Israel	Jan-Jun 2002	No	No	No	None
Saudi Arabia	None				
Turkey	5 Oct 2001; 18 Oct 2001 11 Jul 2002; 2 Dec 2002 24 Dec 2002; 12 and 21 May 2003 9 Jun 2003; 18 Jul 2003	No	Yes	No	None

¹ "Privatisation account" was used to calm appreciation pressures.

Source: Central banks.

Table A5
Inflation targets¹ and performance

	2000		2001		2002		2003		Medium-term target/reference
	Target/reference	Actual	Target/reference	Actual	Target/reference	Actual	Target/reference	Actual	
China	...	...	...	...	...	...	...	...	...
Hong Kong SAR ²	11	-3.7	0.0	-1.6	-1.5	-3	-1.5	-2.6	
India ³	4.5	4.9	5	1.6	4	6.5	5-5.5	4.6	
Indonesia	3-5	5.9 ⁴	4-6	8.7 ⁴	9-10	10	9	5.1	6-7
Korea	2.5 ± 1	1.9	3 ± 1	3.6	3 ± 1	3	3 ± 1	3.1	2.5-3.5
Malaysia	3.2	1.6	1.5 ± 2	1.4	1.8	1.8	1.5	1.1	
Philippines	...	4.4	...	6.1	4.5-5.5	3.1	4.5-5.5	3.1	4-5
Singapore ⁵	1-2	1.3	1-2	1	-1-0.0	-0.4	0.5-1.5	0.5	1-2
Thailand	0-3.5	0.7	0.0-3.5	1.3	0-3.5	0.4	0-3.5	1.8	0-3.5
Argentina ⁶	1	-0.7	0.5	-1.5	...	41	15-5	3.7	
Brazil	6 ± 2	6	4 ± 2	7.7	3.5 ± 2	12.5	8.5	9.3	5.5 ± 2.5
Chile	3.5	4.6	2-4	2.6	2-4	2.8	2-4	1.1	2-4
Colombia	10	8.8	8	7.6	6	7	5-6	6.5	3
Mexico			6.5	4.4	4.5	5.7	3 ± 1	4.0	3 ± 1
Peru	3.5-4	3.7	2.5-3.5	-0.1	2.5 ± 1	1.5	1.5 ⁷	2.5	
Venezuela	15	13.4	10	12.3	20	31.2	< 31.2	27.1	
Czech Republic	3.5-5.5	3	2-4 ⁸	2.4	3-5	1.8	2.7-4.7	0.1	2-4
Hungary	...	10.1	7 ± 1	6.8	4.5 ± 1	4.8	4.5	5.7	Maastricht
Poland	5.4-6.8	8.5	6-8	3.6	3 ± 1	0.8	3 ± 1	1.7	
Israel	3-4	0	2.5-3.5	1.4	2-3	6.5	1-3	-1.9	2
South Africa	...	7.7	...	6.6	3-6	9.3	3-6	6.0	3-6
Turkey ⁹	25	39	12	68.5	35	29.7	20	18.4	Single digit

¹ Targets in place at the beginning of the year; in per cent. ² The HKMA does not target inflation, the targets shown refer to the forecast composite CPI; for 2002 target, GDP deflator shown. ³ India does not have an inflation target; however, indicative projections regarding the inflation rate are made at the beginning of the year. ⁴ For 2000 and 2001, Bank Indonesia used CPI excluding the impact of government prices and incomes policies as a target, realised CPI was 9.4% and 12.6% respectively. ⁵ MAS does not have an explicit inflation target. ⁶ The BCRA does not target inflation formally, but the revision of the 2003 Monetary Programme contained a range for inflation. ⁷ Forecast. ⁸ End of period. ⁹ The Central Bank of Turkey has not yet started to formally target inflation.

Source: Central banks.

Table A6
Foreign exchange reserves¹

	1995	2000	2003	1995	2000	2003
	In billions of US dollars			As a percentage of reserve money		
China	74	166	403	29	36	60
Hong Kong SAR	55	108	118	516	389	314
India	17	37	98	35	61	114
Indonesia	13	28	35	113	173	145
Korea	32	96	155	84	429	452
Malaysia	23	29	43	122	263	363
Philippines	6	13	13	64	163	165
Singapore	68	80	95	567	747	782
Thailand	35	32	41	221	197	172
Argentina	14	24	13	100	162	76
Brazil	50	32	49	120	95	76
Chile	14	15	15	477	432	422
Colombia	8	8	10	125	168	168
Mexico	15	35	58	143	126	133
Peru	8	8	10	193	126	136
Venezuela	6	13	16	177	152	217
Czech Republic	14	13	26	257	246	248
Hungary	12	11	12	229	210	143
Poland	15	26	32	129	233	181
Russia	14	24	73	51	91	111
Israel	8	23	26	132	117	179
Saudi Arabia	7	18	18	48	99	88
South Africa	3	6	6	41	71	59
Turkey	12	22	34	146	148	212

¹ Values at end of period.

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

Table A7
An estimate of the degree of sterilisation¹

	Without controlling for output and inflation			After controlling for output and inflation		
	Short-run	Long-run	R ²	Short-run	Long-run	R ²
China	-0.156 (-2.421)*	-0.938	0.84	-0.167 (-2.396)*	-0.945	0.84
India	-0.283 (-3.558)**	-1.329	0.92	-0.249 (-2.896)**	-1.476	0.88
Indonesia	-0.074 (-1.724)	-0.496	0.88	-0.045 (-1.251)	-0.141	0.90
Korea	-0.329 (-7.137)**	-0.793	0.76	-0.332 (-6.836)**	-0.792	0.75
Malaysia	0.014 (0.317)	0.068	0.60	0.069 (1.656)	0.216	0.70
Philippines	0.130 (1.398)	1.137	0.83	0.166 (1.497)	1.265	0.83
Argentina	-0.224 (-1.663)	-2.721	0.94	-0.273 (-1.748)	-2.131	0.95
Brazil	0.073 (1.386)	0.596	0.86	0.052 (0.956)	0.530	0.86
Chile	0.127 (1.539)	1.006	0.81	0.076 (0.891)	0.415	0.82
Colombia	-0.496 (-1.437)	-3.241	0.77	-0.343 (-0.929)	-1.514	0.78
Mexico	-1.910 (-1.895)	-2.800	0.42	-2.043 (-1.441)	-3.022	0.39
Peru	0.496 (0.758)	0.920	0.21	0.539 (0.747)	1.002	0.18
Venezuela	-0.014 (-0.179)	-0.027	0.54	0.031 (0.439)	0.056	0.57
Czech Republic	-0.122 (-1.194)	-1.555	0.83	-0.229 (-2.195)*	-2.462	0.86
Hungary	0.058 (3.028)**	0.254	0.91	0.060 (3.082)**	0.299	0.91
Poland	-0.087 (-0.785)	-1.575	0.83	-0.087 (-0.068)	-0.647	0.65
Russia	-0.063 (-5.059)**	-0.156	0.91	-0.062 (-4.523)**	-0.153	0.91
Israel	-0.148 (-2.018)	-0.313	0.43	-0.148 (-1.545)	-0.296	0.33
South Africa	-0.022 (-0.253)	-0.064	0.41	-0.100 (-1.090)	-0.228	0.45
Turkey	-0.216 (-0.283)	-2.452	0.81	-0.821 (-1.013)	-7.012	0.82

¹ Estimated through the following two equations: (1) $\Delta DC_t = \alpha_0 + \alpha_1 \Delta NFA_t + \alpha_2 \Delta DC_{t-1} + \epsilon_t$; (2) $\Delta DC_t = \beta_0 + \beta_1 \Delta NFA_t + \beta_2 \Delta DC_{t-1} + \beta_3 GAP_t + \beta_4 INF_t + u_t$; where DC is the log of domestic credit in the central bank balance sheet, NFA is the log of outstanding reserves of the central bank, GAP is the output gap calculated as the deviation from the long-term trend output (calculated with the HP filter) and INF is the inflation rate; sample period from 1999:01 to 2003:05. For Mexico 2000 to 2003. A long-run coefficient value close to -1 implies full sterilisation and between 0 and -1 partial sterilisation.

*, ** denote coefficients significantly different from zero at the 5% and 1% level, respectively.

Source: BIS estimates.

Table A8
Sterilised intervention

	Did the central bank face a shortage of instruments?	Method adopted to meet the shortage	Was unsterilised intervention used?
India	No	Short tenor FX swaps	Sometimes
Indonesia	No		No
Korea	No		No
Philippines	No		During 1993-95 not fully sterilised operations.
Singapore	No		Yes (for example in 1985)
Thailand	Sometimes		According to the appropriate liquidity management there might be unsterilised interventions.
Argentina	Yes	Central Bank bills	Yes
Brazil	No		No
Chile	No		Yes (1998)
Colombia	No		No
Mexico	No		No
Peru	No		Yes
Venezuela	Yes	Modified reserve requirements	Yes
Czech Republic	No	The NBP reached an agreement with the Ministry of Finance to convert non-marketable debt into marketable Treasury bonds.	No
Poland	Yes (1999)		No
Russia	Yes (after crisis in 1998)	Modified reverse repo operations	Market operations are used to exercise general control over liquidity.
Israel	No	...	No
Saudi Arabia	...		...
South Africa	No		...
Turkey	No		Yes

Source: Central banks.

Table A9

Income and balance sheet of the central bank

	Return on foreign assets ¹			Return on domestic assets ¹		
	2000	2001	2002	2000	2001	2002
Hong Kong SAR	6.0	2.9	6.6	-4.4	-14.5	-12.8
India	4.3	5.3	3.7	7.4	5.4	7.9
Korea	5.7	7.8	6.0	5.1	4.0	4.1
Brazil	10.7	21.8	63.8	18.1	15.5	24.1
Chile	11.6	17.2	15.6	10.5	10.1	5.7
Colombia	5.5	4.7	6.6	11.0	16.3	12.4
Peru	6.0	4.2	2.4	20.0	0.0	25.0
Venezuela	3.1	11.6	7.5	10.9	9.0	16.0
Czech Republic	3.6	-2.3	0.1	3.6	2.0	2.5
Hungary	11.4	11.4	10.4	10.8	11.0	7.7
Poland	6.5	5.7	4.5	19.4	14.3	21.3
Israel	-0.4	4.6	4.7	-46.9	-57.4	-51.5
Saudi Arabia	4.7	0.7	3.5			
Turkey	-0.9	-5.5	-1.2	-104.8	3.4	2.8

¹ Calculated as income over outstanding assets.

Source: Central banks.

Table A10

Controls on capital outflows

	Are there limits on corporate lending or investment abroad?	Are non-residents allowed to borrow in domestic currency?	Other restrictions
China	Non-financial firms are forbidden to provide credit abroad and financial firms need approval from the People's Bank of China. Investing in foreign securities is limited to eligible institutions.	Yes	Under a new SAFE ¹ legislation, regions are given a foreign exchange quota (USD 200 million) that can be invested abroad after approval of local SAFE.
Hong Kong SAR	No	Yes	None
India	Firms can invest in equity and rated bonds/fixed income securities up to 25% of net worth of listed foreign companies which have at least 10% stake in Indian companies. Same for individuals but there is no limit.	Only Authorised Dealers can grant loans to non-resident Indians.	Trusts are not permitted to invest abroad. Indian residents cannot invest in foreign real estate or banking companies. Other restrictions apply to investment through special purpose vehicles, joint ventures and Indian software companies.
Indonesia	Banks cannot purchase securities denominated in local currency but issued by non-residents.	Lending to non-residents is prohibited.	Net liabilities in foreign currency may not exceed 10% of shareholders' equity. Insurance companies and mutual funds cannot invest abroad.
Korea	Corporate lending abroad in foreign currency must be declared to the BOK and if the amount exceeds USD 10 million, approval from the Authority is needed. No limits on portfolio investments.	Lending from a bank for more than one million won requires approval from the BOK. Lending from institutional investors, companies and individuals needs approval from the BOK.	Residents' portfolio investments are required to be done through domestic securities companies.
Malaysia	Amounts exceeding MYR 10,000 need permission. Unit trust companies can invest up to 10% of their net asset value or MYR 10 million.	Financial institutions: up to three property loans to finance purchase of immovable property in Malaysia; banks: up to MYR 200,000 to a non-resident with external accounts in Malaysia, up to MYR 5 million to finance projects in Malaysia, up to MYR 500,000 overdraft facilities, up to MYR 200 million intraday or MYR 10 million overnight to finance payments of shares purchased on KLSE.	

Table A10 (cont)

Controls on capital outflows

	Are there limits on corporate lending or investment abroad?	Are non-residents allowed to borrow in domestic currency?	Other restrictions
Philippines	None for corporate, banks may sell up to USD 6 million to residents without approval from the central bank.	No peso loans allowed to non-residents.	The limit of USD 6 million also applies to purchases abroad of bonds; greater amounts need approval from the central bank. Sales and issues of debt securities abroad by residents always require prior approval by the central bank.
Singapore	No	Banks may lend up to USD 5 million to non-residents.	None
Thailand	Corporate lending is permitted up to USD 10 million. Bank of Thailand approval is required for portfolio investments.	For credit not guaranteed by any activities in Thailand, maximum THB 50 billion. Loans can be made to neighbouring countries under approval of the Bank of Thailand.	None
Argentina	Purchases are limited to USD 500,000.	Yes	
Brazil	Residents may invest in debt securities through dedicated offshore investment funds and only in stock exchanges in Mercosur countries.	Only financial institutions are restricted in lending to non-resident domestic financial entities.	Authorisation by the BCB is required when the purchaser of the foreign exchange is an entity belonging to the public administration.
Chile	No	Yes	Banks are subject to a limit on the type of instrument they can invest in, and to provision requirements. Central Bank must also be informed of any foreign investments. Insurance companies can invest up to 20% of their technical reserves and risk capital. Pension funds can invest 25% of its resources abroad.
Colombia	Investment exceeding USD 500,000 must be registered at the central bank.	Yes	None
Mexico	Pension funds are forbidden to invest abroad, they can only invest up to 10% of their assets in securities issued by Mexicans abroad.	Yes	None

Table A10 (cont)

Controls on capital outflows

	Are there limits on corporate lending or investment abroad?	Are non-residents allowed to borrow in domestic currency?	Other restrictions
Peru	Pension funds have an operational limit of 9% and a legal limit of 20%. Banks can invest in foreign financial entities from 5% to 50% of total risk-adjusted capital, and in foreign non-financial institutions between 5% and 30% of the same capital.	Yes	None
Venezuela	No	Yes	
Czech Republic	No	Yes	N/A
Hungary	Institutional investors are restricted to certain investment limits.	Yes	None
Poland	No limits on corporate lending or investing in OECD countries and in Lichtenstein.	Residents cannot grant loans to non-residents in third countries. ²	Investment in real estate is restricted.
Russia	Portfolio investment abroad requires permission from the Bank of Russia. Individuals can transfer up to USD 7,500 in foreign markets.	Yes	Russian credit institutions are required to create a reserve for operations with offshore residents.
Israel	No	Yes	None
Saudi Arabia	None	Yes	None
South Africa	Insurers, pension funds and investment managers can invest up to 15% of their total assets abroad. Collective investment schemes up to 20%.	Yes, but they can only borrow the equivalent rand value of the foreign exchange they bring into the country.	Private individuals can invest up to ZAR 750,000 outside CMA; corporates up to ZAR 2 billion for each new investment in Africa and ZAR 1 billion in the rest of the world.
Turkey	Only banks can extend credit abroad. Portfolio investments can be made only through financial institutions registered with the Capital Market Legislation.	Yes	Transfer of capital in kind or in cash for more than USD 5 million requires approval.

¹ State Administration of Foreign Exchange.

Source: Central banks.

Table A11

Controls on capital inflows

	Restrictions on non-residents' transactions	Explicit or implicit taxes on capital inflows or currency positions	Other restrictions
China	Forward/future or spot foreign exchange rate is "in practice" not permitted. Qualified foreign institutional investors can invest in domestic securities up to a certain quota.	7% on reserve requirements on resident and non-resident deposits and on domestic currency deposits; 2% on foreign currency deposits in domestic banks and 3% or 5% on the same deposits but in foreign banks.	Equity financing abroad needs approval from the China Securities Regulatory Commission.
Hong Kong SAR	None	None	None
India	Non-residents of non-Indian origin cannot invest either in government securities or in non-convertible debentures; foreign institutional investors can invest up to 30% of their total investment in government securities; only persons of Indian origin can invest in acceptance of deposits. Citizens of Bangladesh, Pakistan or Sri Lanka cannot invest in equities.	No distinction in treatment between resident and non-resident reserve requirements	ADRs are possible.
Indonesia	Forward, swap sales or options against rupiah by domestic banks to non-residents are limited to USD 3 million except for investment related transactions. Other controls apply to various transactions with non-residents.	None	None
Korea	Investment in some infrastructure-related firms is limited to 30-50% of total stock issued.	No distinction in treatment in reserve requirements; 1% on overseas emigrant accounts; 2% on foreign currency time deposits, foreign currency instalment savings and foreign currency CDs in resident account.	There are 10 companies listed on the NYSE in the form of ADRs. Borrowings exceeding USD 30 million must be declared to the Ministry of Finance and Economy.
Malaysia	None	No distinction in treatment between resident and non-resident reserve requirements.	ADRs and GDRs available.
Philippines	90-day holding period on peso deposits by non-residents.	All peso deposits are subject to the same reserve requirements; full asset cover on foreign currency deposits. Capital gains from sale of real property are taxed (6%), as well as those from sale of shares not traded on the stock exchange (5%-10%).	ADRs are possible.

Table A11 (cont)

Controls on capital inflows

	Restrictions on non-residents' transactions	Explicit or implicit taxes on capital inflows or currency positions	Other restrictions
Singapore	None	None	SGX has a co-trading agreement with ASX.
Thailand	Thai baht credit facilities to non-residents, without underlying trade or investment activities in Thailand, are subject to a THB 50 million limit.	None	None
Argentina	Forward agreements must be authorised by the Central Bank.	No distinction in treatment between resident and non-resident reserve requirements.	None
Brazil	Non-residents' access to spot or forward/future forex markets is restricted.	A 5% tax applies to inflows with minimum maturity of up to 90 days. A 2% tax is applied to remittances related to obligations of credit card administration companies.	Only domestic regulation provisions.
Chile	No restrictions, amounts greater than USD 10 million only negotiated in the formal exchange market.	No distinction in treatment between resident and non-resident reserve requirements.	ADRs are available and Chilean companies can also be listed in the Latibex (a Madrid-based stock exchange for Latin American companies). Investments through foreign investment funds must be held in Chile for at least five years.
Colombia	Purchase of forward and futures locally is restricted to registered investors; sale or issue of the same instruments is not allowed to non-residents. Approval needed for purchase of shares of Colombian institutions exceeding 10%; non-residents can invest up to 20% of the total issue; investments at a fixed interest rate must have maturity no longer than two years.	Only domestic currency deposits are subject to reserve requirement. 7% tax on remittances of earnings on foreign investment, unless earnings are reinvested for five years. 3% tax on forex receipts from personal services.	Sale or issue of securities needs approval from the Securities Superintendence.
Mexico	None	No distinction in treatment between resident and non-resident reserve requirements.	None
Peru	None	No distinction in treatment in resident and non-resident reserve requirements. Foreign currency deposits have a supplementary requirement of 20% on excess holdings.	Agreements with NYSE and NASDAQ exist for dual listing of securities (common stocks and ADRs).

Table A11 (cont)

Controls on capital inflows

	Restrictions on non-residents' transactions	Explicit or implicit taxes on capital inflows or currency positions	Other restrictions
Venezuela	Currency can only be sold to an authorised exchange dealer.		A few companies have access to the issue of ADRs.
Czech Republic	None	No distinction in treatment between resident and non-resident reserve requirements.	ADR listing is possible.
Hungary	None	No distinction in treatment between resident and non-resident reserve requirements.	ADR listing is possible. Licence from the Hungarian Financial Supervisory Authority is required for the offering of domestic securities abroad.
Poland	Minimum one-year maturity for investment in government securities.	Non-resident deposits with maturity of more than two years are excluded from the reserve base.	At least half of borrowings abroad should have a maturity of not less than one year.
Russia	No transfer of rouble funds to C-type (conversion) accounts is possible.	None	Permission of the Bank of Russia is required to raise capital abroad.
Israel	None	No distinction in treatment between resident and non-resident reserve requirements.	None
South Africa	Any dealings in the derivatives market must relate to legitimate South African exposure resulting from an accrual, investment or asset denominated in rand.	No distinction in treatment between resident and non-resident reserve requirements.	Outward and inward dual listings require approval.
Turkey	None	No distinction in treatment between resident and non-resident reserve requirements. The ratio on foreign currency deposits is 11% (that on domestic deposits is 6%).	None
Saudi Arabia	None	No distinction in treatment between resident and non-resident reserve requirements.	None

Note: ADR = American depository receipt; GDR = Global depository receipt.

Source: Central banks.

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Globalisation and monetary operations in emerging economies

John Hawkins¹

1. Introduction

Globalisation has encouraged a convergence of monetary policy operating procedures in emerging market economies towards market-based instruments. The progressive easing of capital controls and the development of debt markets have undermined interest rate controls. The liberalisation of foreign borrowing has made quantitative loan limits on domestic banks less effective in restraining overall borrowing by firms. This trend towards market-based procedures has gone hand in hand with greater transparency and more explicit signalling of changes in the stance of monetary policy. This evolution parallels that in policy objectives towards inflation targeting (Table 1).

The influence of globalisation on operating procedures (controls versus market-based policies, quantities versus interest rates, short- versus medium-term rates) is discussed in Section 2. Section 3 considers how operating procedures may need to be modified under exceptional circumstances. Some ways for central banks to improve liquidity in the markets in which they operate are set out in Section 4. The final section examines how central banks can best extract information about market expectations, and the extent to which globalisation may be making this harder.

2. Main issues in operating procedures

Direct controls or market-based policies?

Monetary policy generally used to be implemented through direct controls on banks. Maximum (and sometimes minimum) interest rates were set on various classes of deposits and loans, banks were required to hold (often large) proportions of their assets in government securities (or on deposit with the central bank) and limits were placed on how quickly they could expand their loan books.² But using such controls involved what Bisignano (1996) has termed “balancing monetary objectives with market efficiency”. The controls reduced the efficiency of financial markets in various ways, such as by limiting the scope for competition within the banking industry. Financial repression that keeps interest rates low may also discourage saving, or shift it from the regulated financial instrument system into other assets such as equities and real estate, or drive it offshore.

These controls also became ineffective over time. Intermediation prevented from occurring through banks would instead take place through bank-like intermediaries such as building societies, savings and loan associations, finance companies and merchant banks. Sometimes these were affiliates of the banks, which directed customers to them. If the central bank responded by bringing these intermediaries under the regulatory net, new institutions would again spring up outside it.

Financial innovation and globalisation have led most central banks to operate monetary policy by influencing conditions in the market for bank reserves. But there are still some exceptions. For instance, in China the central bank still sets bands for interest rates on many bank deposit and loan products although rates in the bank reserves and bond markets are now market-determined.

¹ Thanks to Claudio Borio, Corrinne Ho, Ramon Moreno, Peter Stebbing, Nick Talbot and Philip Turner for helpful comments.

² Such controls also often involved instructions on the sectors to which loans were made. Brazil and India still require banks to use a set proportion of their deposits for agricultural loans, although these types of restraints are becoming less binding.

Table 1

Targets of central banks and institutional aspects (as at late 2003)

	Policy objective	Policy decision body	Frequency of meetings	Operating target	Main policy instrument
China	Low inflation, growth	MPC	Quarterly	O/n rate, money base	1-year deposit rate, reserve requirement
Hong Kong SAR	Exchange rate ¹	EFAC	Monthly	Exchange rate ¹	Base rate
India	Price stability, growth	CB board committee	Weekly	O/n rate	Liquidity adjustment facility rate
Indonesia				Base money (soon o/n rate)	
Korea	2.5-3.5% inflation ²	MPC	Monthly	O/n call rate	Target o/n rate
Malaysia	Exchange rate ¹	CB board	Monthly	O/n rate	3-month interest rate
Philippines	4-5% inflation ²	Monetary board	Monthly	O/n rate	Repo rates
Singapore	Price stability	MIPM (like an MPC)	Weekly	Effective exchange rate	FX interventions
Thailand	0-3.5% inflation	MPC	Monthly	2-week repo rate	Policy rate
Argentina	Inflation ³			Money base	
Brazil	4±2.5% inflation ²	MPC	Monthly	O/n repo rate	Target o/n repo rate
Chile	2-4% inflation	CB board	Monthly	O/n rate	Monetary policy rate
Colombia	3% inflation ²	CB board		O/n rate	Lombard rate
Mexico	3±1% inflation	CB board	Fortnightly	Bank reserves	Bank reserves target
Peru	2.5±1% inflation	CB board		O/n rate	Benchmark rates
Venezuela				Short-term rate	
Czech Republic	2-4% inflation ²	CB board	Monthly	1-2 week rate	2-week repo rate
Hungary	2% inflation ²	Monetary council	Fortnightly	3-month rate	2-week deposit rate
Poland	2.5±1% inflation ²	MPC	Monthly	2-week rate	14-day reference rate
Russia	5.5-7.5% inflation ²	MPC		Monetary base	2-week refinancing rate
Algeria					Required reserve ratio
Israel	1-3% inflation	Governor ⁴	Monthly	O/n, weekly rate	
Saudi Arabia	Exchange rate ¹	Senior management		O/n rate	Repo rate ⁵
South Africa	3-6% inflation	MPC	6 times/year	O/n rate	O/n repo rate
Turkey	<10% inflation ²	MPC	Monthly	Base money	Discount rate
Australia	2-3% inflation	CB board	Monthly	O/n rate	Target o/n rate
Canada	1-3% inflation	Governor ⁴	8 times/year	O/n rate	Target o/n rate
Euro area	<2% inflation	CB board	Fortnightly ⁶	O/n rate	Min repo bid rate
Japan	>0 inflation?	Operational committee	Fortnightly	O/n rate	Bank reserves target
Sweden	2±1% inflation	CB board	Fortnightly	O/n rate	Repo rate
Switzerland	0-2% inflation	CB board	Quarterly	3-month Libor	Target Libor
United Kingdom	2.5% inflation	MPC	Monthly	Short-term rates	2-week repo rate
United States	Low inflation, growth	FOMC (an MPC)	8 times/year	O/n rate	Target o/n rate

Note: CB = central bank; EFAC = Exchange Fund Advisory Committee; FOMC = Federal Open Market Committee; MIPM = Monetary and Investment Policy Meeting; MPC = Monetary Policy Committee/Council; o/n = overnight.

¹ Against US dollar. ² Currently has higher interim target. ³ Target to be set in 2004. ⁴ Advised by a committee.

⁵ Largely follows US federal funds rate. ⁶ Normally only changes monetary policy settings at first meeting of month.

Sources: Central banks; JPMorgan Chase.

There are also circumstances under which market-based operating procedures may not work well. For example, such procedures require that the bank reserves market is reasonably liquid and efficient and that there is a liquid market (government securities, repos or perhaps foreign exchange) in which the central bank can trade to affect bank reserves. These issues are taken up further in Section 4. In some economies, the banking system may be “shell-shocked” after a banking crisis, and may concentrate almost exclusively on managing its large stock of non-performing loans and rebuilding capital. Such banks often buy government securities rather than lend to the private sector. And heavily indebted companies become more reluctant to borrow. In such circumstances bank credit may be insensitive to movements in policy interest rates.

Interest rates or quantities in the bank reserves market?

The choice between monetary aggregates and interest rates has long been a matter of debate among economists. The classic conclusion is that sticking to a money aggregate will stabilise the economy if shocks come from the real economy (that is, the IS curve) but sticking to an interest rate target is preferable if shocks affect the demand for money (see Poole (1970)). Nowadays, most central banks choose to target interest rates rather than quantities (Table 1). Interest rate changes normally have a clear effect on the cost of credit, with bank loan interest rates often immediately following changes in the operating target. For an economy with a fixed exchange rate and an open capital account, such as Saudi Arabia, a short-term interest rate is the natural target as it can be set with respect to the foreign interest rate; see Al-Jasser and Banafe (1999). Interest rate moves can be readily compared with market expectations embedded in the yield curve (discussed further in Section 5), which is not the case with a quantity target.

There are still some recent cases of targeting quantities. The Bank of Thailand’s country paper describes how, for a short while after the 1997 crisis led to the abandonment of its implicit fixed exchange rate, the Bank set daily and quarterly money base targets. But it soon found that radical changes in the financial system undermined the relationship between base targets and broader money aggregates, and in turn macroeconomic objectives.

Mexico’s central bank pursues a (negative) bank reserves target. As the banks are short of funds, this amount is known as the “corto” (a “short position”). When the central bank tightens monetary policy it increases its target for this borrowing so that at least some banks will end up with a costly overdraft at the central bank that will put upward pressure on interest rates; see Bank of Mexico (2003). A quantity target may operate as a less strict interest rate target. In the short term, greater variation would be tolerated in interest rates to reduce the variation in financial quantities or in the exchange rate resulting from shocks; see Ortiz (2000) and Schaechter (2001). It has been argued that, in Mexico, the strong role of the exchange rate in inflation and inflationary expectations, allied with the relatively small role of banks in providing credit to the private sector, mean that a system which reduced exchange rate volatility, even at the expense of higher volatility in short-term interest rates, would be preferable.

However, Ortiz (2000) refers to a “not-so-distant future” when inflationary expectations will be anchored by the inflation target, and so will react less to exchange rate movements. Long-term debt markets will then be more developed. At this time, Mexico’s central bank will move to using an interest rate as its operating target/instrument. Marcos (1999) interprets the corto as a signalling arrangement, arguing that the size of the corto is minimal relative to banks’ overall funding but announced changes have a large effect on interest rates.

Quantity targeting is sometimes required by IMF programmes.³ It may be used by central banks judged to lack credibility, at least as a transitional regime. Quantity targeting can also be useful when the overnight interest rate has been cut to zero; see Section 3.

³ For example, the loan agreement between Thailand and the IMF after the 1997 crisis set a ceiling on net domestic assets of the central bank, putting an upper limit on the monetary base. This is becoming less common. The country paper by the Central Bank of Brazil describes how, when Brazil adopted inflation targeting in 1999, it persuaded the IMF to phase out the ceiling on net domestic assets as a performance criterion in favour of a formal consultation mechanism based on the inflation target. This has now become a common practice. Although the IMF is still pressing Argentina and Turkey to keep the broad monetary base within a varying corridor, this is likely to be replaced by an inflation targeting regime in due course. See Blejer et al (2001).

Overnight or medium-term interest rates?

If a nominal interest rate is the operational target, the next question is, which interest rate? The overnight rate in the bank reserves market is the most common choice (Table 1), as it is usually the rate the central bank can control most easily. But some central banks hesitate to focus exclusively on the overnight rate as short-lived fluctuations may be misinterpreted as a change in monetary policy. However, unintended fluctuations are now generally quite small. Looking at average absolute daily changes in the overnight interest rate, these are now only around 10 basis points in the median emerging economy. This reflects the impact of structural reforms, such as floating currencies and tender systems for selling government debt, and greater experience in conducting market operations; see Stebbing (2003). Also, it is now general practice to announce changes in the policy stance so unintended fluctuations are less likely to be misinterpreted.

In other cases, the concern may be that movements in overnight interest rates are not well connected to movements at longer maturities that are more relevant to consumption and investment decisions. In some economies banks tie loan rates to overnight rates (eg Brazil, Korea, Saudi Arabia, South Africa, the United States), while in others medium-term rates are the benchmark (eg Hungary, Mexico, the United Kingdom). However, this argument may be circular. Once a rate is chosen by the central bank as its policy focus, it is more likely to be used as a benchmark: see Canada's experience as described in Borio (1997).

What style of operating procedure?

Central banks with an interest rate target like to keep fluctuations in short-term interest rates relatively low.⁴ In a perfect market, having an averaging period for reserves might be enough to keep rates smooth.⁵ But in practice the market does not work quite this well. The market for bank reserves is subject to various shocks (described in Annex A) to which the central bank responds (see Annex B).

The central bank signals its monetary stance and supports this by structures or operations which keep the market-clearing interest rate close to the announced target. There are two main styles of monetary policy operating procedures. The "corridor" approach (or as Issing et al (2001) call it, the "European" style) has three key features: a corridor bounded by two administered rates set by the central bank; use of occasional market operations (repos or collateralised loans); and reserve requirements with averaging to smooth short-term interest rates. The "active" approach ("Fed" or "hands on" style as Bartolini and Prati (2003) call it) has a smaller role for reserve requirements while involving daily or more frequent market operations, and uses standing facilities operating primarily as a "safety valve" for individual banks (BIS (1997)). Among emerging economies, central European central banks and the Reserve Bank of India operate more in the corridor style. In contrast, many East Asian central banks, Brazil and South Africa are closer to the active approach. In January 2003, the US Federal Reserve moved some way from the active approach in the direction of the corridor approach.

⁴ As medium-term interest rates reflect expectations of future movements in short-term rates, central banks have more influence over medium-term rates when short-term rates give a clear signal. More orderly market conditions may make the transmission mechanism quicker and more predictable. Moreover, it should assist in the quest for financial stability by making it easier for financial institutions to assess and manage risks. Excessive volatility in money markets may feed uncertainty about economic fundamentals. Failure to keep overnight rates near the announced target may adversely affect the overall reputation of the central bank, especially if interest volatility is seen as a symptom of misallocation of liquidity among banks and uncertainty about monetary policy. Furthermore, interest volatility blurs signals from the market.

⁵ If banks expect interest rate fluctuations during the averaging period, they will try to purchase reserves when rates are "low" and sell when they are "high", which should have the effect of smoothing interest rates over the averaging period (an effect sometimes referred to as the "martingale property").

3. Operating procedures in exceptional circumstances

In normal times central banks deal with modest shocks to the bank reserves markets, of which movements in government deposits are often the most unpredictable.⁶ However, operating procedures that work best in normal times are not necessarily optimal in exceptional circumstances. Emerging economies with floating exchange rates may face what has been termed “sudden stops” in capital inflows. Those with fixed exchange rates may be subject to speculative attacks. In both of these exceptional cases, the authorities may wish to drive short-term interest rates up to very high levels for a short period. The challenge is to moderate how much higher overnight rates pass through into medium-term interest rates which affect domestic economic activity.

Such concerns might lead central banks following an “active” approach to target a medium-term (say somewhere between two weeks and three months) interest rate which might be thought relevant to most domestic borrowers. This might allow high overnight rates to support the currency in foreign exchange markets with a limited effect on domestic demand. For central banks using a “corridor” approach, it may be necessary to raise or suspend the top of the corridor for a short period. In some cases, central banks may judge it worth sacrificing some clarity in policy in order to maintain greater flexibility. The absence of a strong link between overnight rates and longer-term rates may, however, also have certain advantages.

Following the 1997 Asian crisis and the 2001 terrorist attacks, the Singaporean authorities temporarily widened the (undisclosed) bands within which they allow the effective exchange rate to vary. Three other cases of responses to exceptional circumstances are considered below.

Hong Kong SAR’s response to the “double play”

An exceptional shock may require operations outside the usual financial markets. After the Asian financial crisis of 1997, Hong Kong’s currency board came under a speculative attack. A few highly leveraged hedge funds used a “double play”, taking short positions against both the currency (futures) and equity markets. If the authorities had abandoned the currency board arrangement, the first position would have been profitable. If instead the authorities had maintained the currency board, interest rates would have been driven up, equity prices would have fallen and so the second position would have been profitable. Initially these tactics worked as interest rates were driven very high. But the authorities made a dramatic and unexpected move in August 1998, making very large purchases in the equity market which made the short positions unprofitable. This was a very controversial move at the time, and was seen by many as inconsistent with Hong Kong’s long-nurtured reputation for free markets. However, it was successful: the linked exchange rate was maintained, interest rates fell back and the authorities gradually sold off the acquired equities at a large profit; see Goodhart and Lu (2003).⁷

Mexico

From early to mid-2002 international investor sentiment about Latin American economies deteriorated, as reflected in bond spreads and exchange rate depreciations. The latter threatened to push inflation well above targets. The responses of the authorities in the various economies differed, in part due to differences in their operating procedures but also in part because the shocks, transmission mechanisms and preferences of the authorities differed across the various economies.

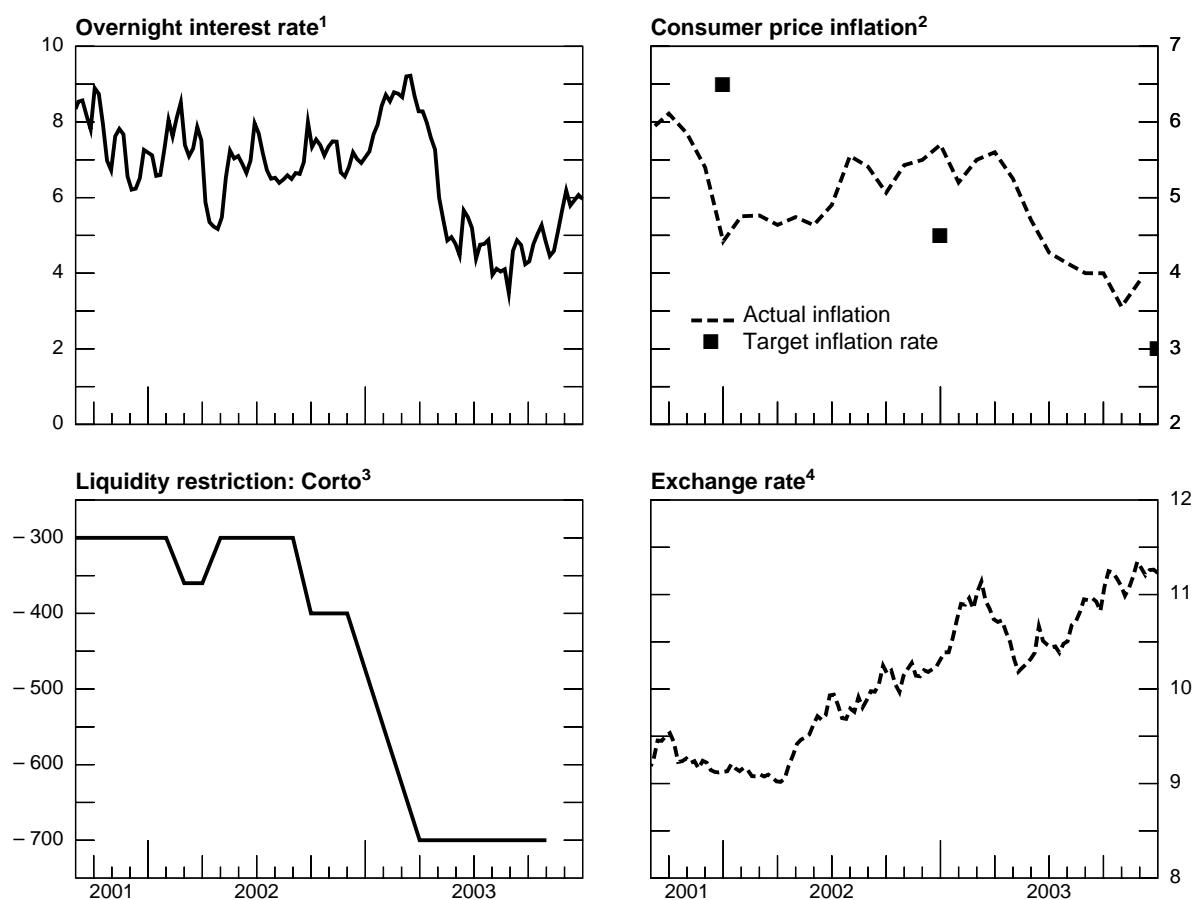
⁶ Table B4 in Annex B shows that this seems true regardless of the openness of the economy or other differences. See the paper in this volume by Mihajek for further discussion.

⁷ As many of the acquired shares were sold off by being parcelled up in a “tracker fund” (which operated like a passive unit trust), a higher proportion of the equity market is probably now held by domestic retail investors than before the crisis.

Mexico announces policy in terms of quantities. The Mexican authorities initially did not adjust the “corto” from April-June 2002 as short-term interest rates rose (Graph 1).⁸ This could be taken as an implicit signal that they viewed the move in interest rates (at least the direction) as appropriate to avoid inflation rising excessively. From late 2002 to early 2003 the Mexican authorities explicitly signalled a desire for tighter monetary conditions by making the “corto” tighter. This was thought to be appropriate as inflation had exceeded the 2002 target and did not appear to be heading down towards the lower 2003 target. From April 2003 short-term interest rates fell sharply as inflation fell. This raised an issue of communication: there had been no explicit signal by the central bank that it wanted easier monetary conditions. However, the lack of any subsequent adjustment in the corto suggested that the authorities, by then, regarded easier monetary conditions as appropriate, since inflation was falling at this time.

Graph 1

Mexico: financial indicators



¹ In percentages. ² Annual percentage changes. ³ In peso. ⁴ Peso per US dollars.

⁸ By contrast, in Brazil, already very high interest rates were eased slightly. While in February 2002 consensus forecasts for inflation were very similar for Mexico and Brazil (4% for 2002 and 5% for 2003), by August they were significantly higher in Brazil but unchanged in Mexico. It was only in late 2002, when inflation rose sharply, that Brazil tightened monetary policy.

Japan

The Bank of Japan responded to a sluggish economy by cutting interest rates in the second half of the 1990s. By 1999 overnight rates were virtually zero, but deflation meant that real interest rates were still positive and there were few signs of a sustained recovery. In March 2001 the Bank adopted new operating procedures by setting a target for bank reserves with the central bank. It was initially set at JPY 5 trillion, which was steadily increased to JPY 27-32 trillion by late 2003. Interest rates stayed near zero but consumer prices continued to fall. Recently the authorities said they would maintain this stance until the deflation ended.

4. Improving liquidity to make operating procedures more effective

The greater reliance on financial markets, now more open to international influences, raises the issue of what a central bank can do to encourage liquid and efficient markets in both bank reserves and the security/instrument with which it transacts with banks.

Liquidity of the bank reserves market

The central bank will most readily be able to use the bank reserves market to influence overall financial market conditions when this market operates smoothly. Yet there are often various impediments to liquidity in this market. Van 't dack (1999) notes that taxation of interbank transactions in Colombia, a high degree of unofficial dollarisation in Peru and regional segmentation of interbank markets in Russia all led to less liquid interbank markets. There have also been cases where previously liquid markets dried up during crises.

On the one hand, liquidity may be enhanced by allowing broad access to the market. On the other hand, the bank reserves market may operate best when there is little doubt about the credit standing of all participants. For this reason it is usually limited to banks subject to licensing and supervision.

Liquidity of domestic bond and repo markets

While central banks can still employ market operations by controlling the primary issue of either government or their own securities (Table B2 in Annex B), liquid secondary markets are preferable: see Stebbing (2003). This is one reason central banks have encouraged them; see the paper by Chung in this volume.

Government securities markets are now reasonably liquid in most emerging economies, although often less so than in advanced economies. Measures that may improve liquidity include governments issuing bonds even when running large surpluses; avoiding locking up a large proportion of government paper in mandatory holdings by banks and insurance companies to meet prudential requirements; shorter settlement cycles, which is facilitated by having “dematerialised” securities (ie computer entries rather than physical scrip); central counterparties and real-time gross settlement (RTGS); better infrastructure for clearing and settlement; standardised conventions and master agreements; proper supervision of markets and participants; allowing short-selling; establishing benchmarks; developing associated derivatives markets; minimising taxes on transactions; a liberal approach to participation by foreign banks in domestic financial markets; steady and predictable primary issuance and encouraging a wider investor base (such as by development of funds managers such as pension funds and unit trusts); see Mohanty (2002). Some of these areas are admittedly outside the direct purview of central banks.

Alternatively, the central bank could issue its own paper. Such paper constitutes around half the central bank's liabilities in Korea and over a fifth in Hong Kong SAR, Hungary, Mexico and Poland. This may be desirable where secondary markets are undeveloped, as operating in primary markets mixes monetary and debt management. The Hong Kong Monetary Authority issued its own paper as the government had no debt and the Authority wanted to develop the bond market and establish a benchmark yield curve. In Mexico, the central bank wanted longer-term paper than the government wanted to issue. However, one problem associated with the central bank issuing paper is that it might not earn enough returns on its assets (principally foreign reserves) to cover the interest paid on them, leading to losses. In Chile, the central bank issued promissory notes in the 1990s to fund accumulation

of international reserves associated with intervention intended to hold back the peso's appreciation. The resultant interest expenses are still causing losses. In some economies (eg the Philippines, Poland), the central bank ceased issuing its own securities after the government reversed its previous opposition to the use of its own securities for market operations. There are some plausible arguments against having both government and central bank paper on issue. Splitting the public sector paper market between government and central bank paper makes both less liquid; McCauley (2003) therefore advocates the government issuing more bonds than it needs for its own financing and placing deposits with the central bank.

As central banks increasingly use repos rather than outright transactions (Table B2), liquidity in the repo market will become the more important factor, but many of the considerations mentioned above still apply.

5. Extracting information about market expectations

Financial markets offer potentially useful information for central banks as they summarise the views of market players who have strong incentives to have well informed opinions. Unlike much other information, market prices are available immediately and are not revised. While even unbiased expectations may be poor predictors, they will be useful indicators of sentiment.⁹ Central banks need to know about market expectations of short-term rates in order to assess the likely impact of a policy change.¹⁰ This argues for market operations being concentrated in short maturities so that the longer maturities continue to provide information about market expectations.

The term structure of government securities may be most useful for assessing policy expectations over the longer term and the credibility of the policy regime. Private sector debt instruments (including interest rate swaps, interbank credits and certificates of deposit) have the problem that it can be hard to distinguish credit spreads from monetary policy expectations. Interest rate futures only refer to fixed expiry dates (and so may not be useful for measuring very short-term expectations) and are often illiquid for contracts beyond a few months. This information may be supplemented by a market survey of economists (the Bank of England's survey asks for probability distributions from individual respondents, and so gives measures of both the divergence of opinions and the strength with which individuals hold their opinions).

Simple interpretations (eg measuring the one-year bond yield expected to prevail in a year's time by subtracting the current yield on a one-year bond from twice that on a two-year bond) abstract from the risk premium on longer-term assets, and the liquidity premia on less traded assets. If these premia are sufficiently small, as they usually are for repos, they can be ignored. If they are constant, then changes in expectations can be readily identified even if not the expectations themselves. However, changes in risk aversion, or perceptions of risk, may lead to significant changes in risk premia. Söderlind and Svensson (1997) find there is little evidence of constant risk premia over short horizons, based on their experience with Swedish, UK and US data. Yields may also be affected by differences in the taxation of different instruments, as noted in the paper by Chung in this volume.

A probability distribution of future interest rates and exchange rates can be extracted from option prices, assuming risk neutrality; see the paper by Chui et al in this volume.¹¹ A problem with their construction, especially in emerging economies, is that options are often thinly traded, particularly when their strike price is far away from the current future price and when they have a long maturity.

⁹ For example, in Hong Kong SAR the authorities know the exchange rate will stay very close to the link rate but futures and options prices give information on market sentiment towards the exchange rate.

¹⁰ This is not to say the central bank should necessarily follow these expectations. This is of course an old debate. The Federal Reserve's failure to follow market expectations (which were apparently based on one newspaper column) of a further cut in the federal funds rate in mid-2003 was rather perversely followed by criticism of the Federal Reserve rather than of the failed predictions in the market; see Baum (2003).

¹¹ The Bank of Israel has issued small amounts of foreign exchange options specifically to derive such information.

When both indexed and non-indexed bonds are issued and heavily traded, this can give a good measure of inflationary expectations. The paper by Sokoler in this volume reports on the use of information as an important input to policy decisions, and if necessary as a means of justifying to the government the need for tight monetary policy. Indexed bonds tend to be most useful for measuring medium-term expectations as longer-term indexed securities are generally bought and held by institutional investors. There may be a selection bias, however, in that indexed securities will be bought by investors with higher than average inflationary expectations. It is also not obvious whether an indexed bond should have a higher or lower risk premium. All this suggests that use of this approach may provide a better measure of changes in inflationary expectations than in the level.

If the central bank is to extract information about *market* expectations from traded instruments, it must ensure its own transactions do not dominate the market. Transactions using repos do not directly affect prices in the bond market. Similarly, swap transactions in a liquid market do not as a rule directly affect the exchange rate.¹²

As domestic financial markets in emerging economies become more globalised, international factors increasingly influence them, reducing their information content. Graph 1 in Anderson and Moreno's contribution to this volume shows that for many economies, movements in bond yields and equity prices closely follow those in major economies. This suggests that they may give relatively little information about domestic conditions and prospects. This issue deserves further investigation.

¹² Swap rates may be becoming more useful than bond yields as an indicator of interest rate expectations; see Reinhart and Sack (2002) and Clerc et al (2002) for conflicting views on this.

Annex A:

The demand for, and supply of, bank reserves

Banks hold funds in accounts with the central bank, known as “bank reserves”, to facilitate settlement of transactions by bank customers or because they are required to hold reserves by the central bank.

Settlement balances

Banks almost always settle transactions between each other on the books of the central bank, for many reasons.¹³ First, it may be compulsory, as in Canada. Second, the central bank is almost universally regarded as the safest counterparty. Third, banks may not want a rival organisation to gain more information about their operations. Finally, the central bank may provide routine intraday or overnight credit and possible emergency liquidity assistance. See CPSS (2003) for more discussion.

Settlement balances have a high (opportunity) cost when, as is generally the case, they bear no interest. Banks will still aim to hold sufficient balances to avoid the penalties that arise if they cannot meet their obligations at the end of the day.

Reserve requirements

Banks are usually required to place a minimum amount of bank reserves with the central bank in proportion to their customers’ deposits (Table A1). The fact that Australia, Hong Kong SAR, Sweden, Switzerland and the United Kingdom have successfully operated monetary policy without such requirements shows they are not essential. But they may facilitate monetary operations. Reserve requirements may also be a way of charging banks for the services provided to them by the central bank, sometimes have prudential motives or boost central bank independence by giving it a source of revenue, and were formerly a monetary policy tool in their own right; see Nel (2000).

Some economies apply differing reserve requirements to differing types of deposits. In the United States this has led to a decline in required reserves as “sweep programmes” automatically transfer depositors’ funds from reservable to non-reservable accounts; see Krieger (2002). There are also differences in what counts in meeting reserve requirements. Some economies include vault cash, and in South Africa it accounts for half the required reserves.¹⁴

Reserve requirements can help smooth overnight interest rates if they are specified as a fortnightly or monthly average rather than needing to be met every day, and if it is possible to use the reserve requirement holdings to meet settlement needs. This is especially desirable in less developed financial systems where interbank markets are less liquid and long and variable lags in the clearing and settlement systems lead to uncertainty about the timing of future settlements. However, averaging may also reduce the need for banks to trade in the interbank market and so hamper its development.

The demand for reserves will be harder to predict if reserve requirements are related to the current level of bank liabilities. For this reason most central banks build in a lag between the calculation period and the required holding period. A desire to reduce uncertainty about required reserves led the US Federal Reserve in 1998 to reinstate the lag in reserve requirements it had removed in 1984.

¹³ There have been exceptions. Prior to December 1996 banks in Hong Kong SAR settled on the books of HSBC, the largest bank in the economy. The Monetary Authority had an account with HSBC and from July 1988 imposed rules (the “accounting arrangements”) to give the Authority a degree of power over monetary conditions. In the United Kingdom many small banks settle on the books of larger banks (the “settlement banks”) which themselves have accounts at the central bank.

¹⁴ There are security risks and additional transport costs if banks are encouraged to move cash back to the central bank and it may arguably give an unfair benefit to banks located close to the central bank; Borio (1997) and Van der Merwe (1999). However, allowing too much vault cash to count for reserve requirements may lead to an accumulation of soiled banknotes in circulation; Park (2002). Vault cash is a rising proportion of required reserves in the United States and many banks are able to meet their reserve requirements exclusively from it. Germany excluded vault cash in 1995 partly to avoid this. Hungary stopped allowing vault cash to count in July 2000, as part of aligning its requirements to those of the ECB.

Table A1
Rules on banks' required reserves (as at late 2003)

	Required ratio	Interest paid on reserves	Averaging period		Eligible assets: deposits with CB plus
			Length	Lag from calculation period	
China	6%	1.9%	10 days		Vault cash
India	4.5%	Bank rate (on part over 3%)	2 weeks	2 weeks	None
Indonesia	5%	None	None	2 weeks	None
Korea	1-5%, avg 3%	None	2 weeks	1 week	Vault cash (up to 35%)
Malaysia	4%	None	2 weeks	2 weeks	None
Philippines	17%	4% (on 40% of reserves)	1 week	1 week	Vault cash and government securities (up to 75%)
Singapore	3%	None	2 weeks	2 weeks	None
Thailand	6%	None	2 weeks	2 weeks	Vault cash (up to 2.5% points)
Argentina	22-40%	Federal funds – 20 bp	1 month	None	Vault cash
Brazil	Varies ¹	Varies ¹	Varies ¹	Varies ¹	Vault cash (up to 33%)
Chile	3.6-9%	Half previous month's inflation	1 month	None	Vault cash
Colombia	2.5-13%	Yes ²	15 days	8 days	Vault cash
Mexico	Zero ³	None	28 days	.	.
Peru	6% (20% fc)	None	1 month	None	Vault cash
Venezuela	15%	None	1 week	1 week	None
Czech Republic	2%	Repo rate	1 month	2 days	None
Hungary	5%	Below market ⁴	1 month	1 month	None
Poland	4.5%	None	1 month	1 day	Vault cash (limited)
Russia	7-10%	None	20 days	1 month	Vault cash
Algeria	4.25%				
Israel	0-6%	None	1 month	None	Vault cash
Saudi Arabia	7% (demand); 2% (time)	None	None	15 days	None
South Africa	2.5%	None	1 month	15 business days	25% of vault cash ⁵
Turkey	6% (11% fc)	Yes	2 weeks	2 weeks	None
Euro area	2% ⁶	Market rate	1 month ⁷	24 days	None
Japan	0.05-1.2%	None	1 month	Partly lagged	None
United States	3-10%	None	2 weeks	2 weeks	Vault cash

Note: fc = foreign currency. Hong Kong SAR, Australia, Sweden, Switzerland and the United Kingdom have no required reserves (although the United Kingdom has a 0.15% cash ratio deposit to finance some of the central bank's costs). Canada has a zero reserve requirement.

¹ Brazil has different reserve requirements for eight types of deposits. ² 75-100% of inflation target. ³ Allows overdrafts in bank reserves; also has system of "compulsory deposits". ⁴ Rising to market rates by May 2004. ⁵ Being phased out; none will count by August 2004. ⁶ Deposits <2 years. ⁷ From 2004 will change to an irregular period of 28 to 46 days to align with meetings of the ECB Council; see ECB (2003).

Main sources: Nel (2000); questionnaires from the 1998, 2002 and 2003 Deputy Governors' Meetings.

Trends in reserve requirements

Reserve ratios impose a form of “seigniorage” tax on banks, which tends to be higher in emerging economies than in advanced economies; see Hawkins (2003, Table 3). Concerns that this tax may be reducing intermediation or redirecting it away from banks has led central banks to seek to reduce their reserve requirements (and averaging itself reduces the burden of reserve requirements (Table A2)). These same concerns have also led some emerging economies to pay interest on required reserves (Table A1).

Table A2
Bank reserves as a percentage of bank deposits

	Dec 1980	Dec 1990	Dec 2000	June 2003 (or latest)
Emerging Asia ¹	14	12	8	8
Latin America ²	30	20	13	21
Central and eastern Europe ³	...	17 ⁴	17	11
Africa and Middle East ⁵	56	13	11	11
United States	6	4	2	2
Selected other advanced economies ⁶	8	2	2	1

¹ Unweighted average of India, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand. ² Unweighted average of Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela. ³ Unweighted average of the Czech Republic, Hungary, Poland and Russia. ⁴ End-1993. ⁵ Unweighted average of Algeria, Israel, Saudi Arabia, South Africa and Turkey. ⁶ Unweighted average of Australia, Canada and Switzerland.

Source: IMF, *International Financial Statistics*, line 20 as a percentage of the sum of lines 24 and 25.

Nowadays emerging economies rarely vary reserve requirements to affect financial conditions, although there are still some cases. Argentina lowered reserve requirements to ease monetary policy when its currency board framework prevented it from lowering interest rates, Brazil raised requirements when its currency was under pressure in 2002 and China raised them in August 2003 to restrict bank lending.

The supply of bank reserves

The supply of bank reserves can be analysed by rearranging the central bank's balance sheet.

Central bank balance sheet

Liabilities		Assets	
Foreign liabilities	FL	Foreign assets	FA
Currency	C		
Bank reserves	R		
Deposits by government	GD	Lending to government	GL
Other liabilities and capital	OL	Other assets (including lending to banks)	OA

This gives: $R = (FA - FL) + (GL - GD) - C + (OA - OL)$

and taking changes $\Delta R = \Delta F + \Delta G - \Delta C + \Delta NOA$.

This is a simplification in some ways. For example, some changes in the government's accounts with the central bank have their counterpart in changes in central bank capital (ie ΔG is offset by ΔNOA) rather than affecting the bank reserves market.

Foreign assets

Foreign exchange intervention is generally not a major source of variability in the bank reserves market (other than during crises) in advanced economies; see Borio (1997). Given the standard two-day settlement lag for foreign exchange transactions, this component is known with certainty within the horizon of daily operations. However, emerging economies, even those eschewing formal pegs, more commonly engage in foreign exchange intervention, and sometimes in large amounts; see the paper by Mohanty in this volume for further information.

Currency

Currency fluctuations are sometimes erratic, and there can be large seasonal fluctuations around Christmas, Easter and Chinese New Year. There is often a within-week pattern of increases before public holidays as consumers withdraw cash and subsequent decreases as shops bank their receipts. Generally, the fluctuation in the demand for notes has no effect on the policy rate as these fluctuations tend to net out over the year. In countries recovering from high inflation, however, longer-term currency increases may be significant.

Government transactions

Central banks report that net government deposits are the hardest component to predict (see Table B4) even now that few central banks lend to governments. The complications raised by transactions with government are discussed in the paper by Mihaljek in this volume.

Annex B: Monetary policy operating procedures

Monetary policy operating procedures encompass both standing facilities, which allow banks to initiate transactions with the central bank, and market operations undertaken by the central bank. Both can play an important role in keeping interest rates at desired levels.

Standing facilities

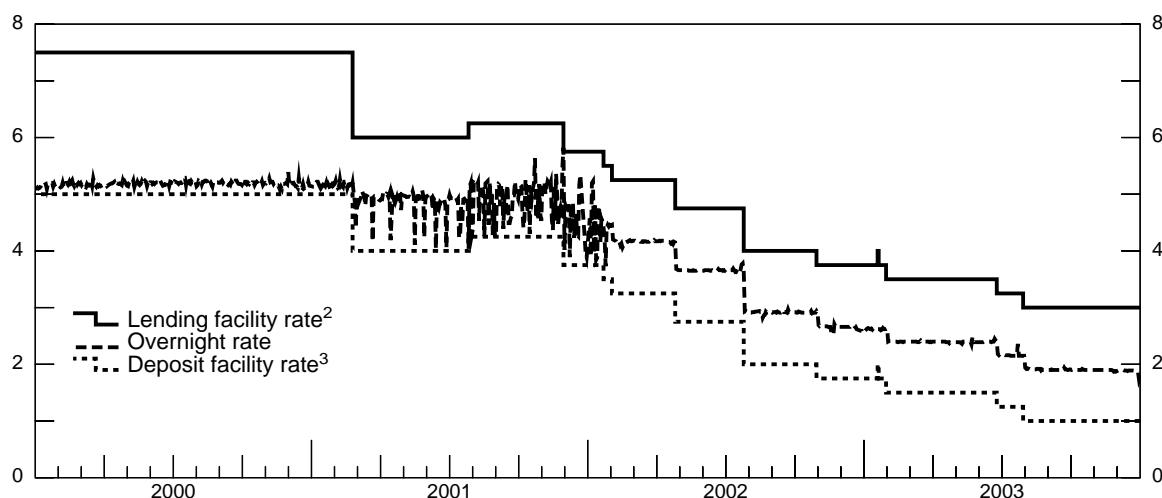
Central banks pursuing a corridor approach bound the overnight interest rate by providing standing deposit and lending facilities.¹⁵ Table B1 lists these facilities while Graph B1 provides an illustrative example of their operation. The Czech experience shows three possible responses to a corridor: the overnight rate being bound by it, varying significantly within it, and keeping close to its midpoint.¹⁶

Access to the lending or credit facility (often termed “lombard” or “discount window”) is sometimes restricted.¹⁷ Obviously, collateralised credit facilities are restricted by the holdings of eligible paper. Some central banks charge more for loans beyond a certain amount (Chile, Hong Kong SAR, Israel).

The deposit facility will not offer an attractive return in order to avoid it being used too often. In the Philippines the central bank tiers the interest rates it pays; as of July 2003 it paid 6.75% on the first PHP 5 billion, 3.75% on the next 5 billion and only 0.75% on deposits exceeding PHP 10 billion.

Graph B1

Czech Republic: Central bank lending and deposit facility rates¹



¹ In percentages. ² Lombard rate. ³ Discount rate.

Sources: Bloomberg; national data.

¹⁵ Central bank loans to banks, often at below market interest rates, had been used for financing priority industries or smaller companies in many emerging economies, but this “policy lending” has now largely disappeared.

¹⁶ The reduced volatility since early 2002 reflects a longer reserve maintenance period and the setting of the two-week repo rate at the midpoint of the deposit and lombard rates, both moves bringing Czech procedures in line with those of the ECB.

¹⁷ As in the United States until early 2003, Korea’s central bank sets the interest rate on its loan facility below its target for the cash rate but discourages banks from accessing liquidity adjustment loans too frequently. A 100 basis point premium is charged to banks that borrow for three consecutive months and The Bank of Korea inspects the financial condition of banks making frequent use of the facility; see Park (2002). The loans are also subject to an aggregate ceiling within which individual banks are allocated a quota.

Table B1
Standing facilities (as at late 2003)

	Form of credit provided by central bank	Interest-paying placements with central bank	Spread between rates on facilities (basis points)	Collateral required for credit facilities	Other restrictions on use of credit facilities	CB has discretion to set rate for individual banks?
China	Rediscount window					
Hong Kong SAR	Discount window	None	. ¹	CB ²	No	No
Indonesia	FPJP (o/n facility)	Deposit facility		G, CB	Yes	No
Korea	Temporary credit facility	None	.	G, CB	Yes	No
Philippines	Overnight lending	Overnight borrowing	225	G	No	
Singapore	End-of-day liquidity facility			G	Yes	No
Thailand	Liquidity window	None	.	CB, G	No	No
Argentina	Rediscount facility	Yes		G	Yes	No
Brazil	Discount window	None	.	G	No	No
Chile	Liquidity credit line	Liquidity deposit facility	100 ³	No	No	No
Colombia	O/n repo	Borrowing auction	100	G	No	No
Mexico	Overdraft	None	.	G	Yes	No
Peru	O/n credit facilities	Deposit facility ⁴	125	CB, G, AAA	Yes	No
Venezuela	Rediscount facility	None	.	G	No	No
Czech Republic	O/n repo	O/n deposit facility	200	Yes	Yes	
Hungary	O/n collateralised credit	Deposit facility	200	G,C	No	No
Poland	Lombard loans	Short-term deposits	300	G	No	No
Russia	O/n collateralised loan	O/n deposits	>1,000	CB, G	No	Yes
Algeria		Deposit facility				
Israel	Borrowing facility			G		
Saudi Arabia	Overnight repos	Reverse repos		G	No	No
South Africa	Final clearing repo	Final clearing reverse repo	300	G,CB		
Turkey	Liquidity window	Bid facility	600	G	Yes	No
Australia	Collateralised lending	Interest paid on reserves	50	Yes		
Canada	Fixed-term loan		50	Yes		
Euro area	Marginal lending facility	Marginal deposit facility	200		No	No
Japan	Complementary lending facility	None	.	Yes	Yes	No
United Kingdom	Lending facility	Deposit facility	200	Yes	Yes	
United States	Discount window	None	.	Yes	Yes	No

Note: India and Malaysia have no standing facilities. AAA = AAA-rated entities; CB = central bank; G = government bonds; C = investment grade corporate bonds.

¹ Previous deposit facility paid 200 bp less than credit facility in 1992-97 and 300 bp less in 1997-98. ² Some HK dollar debt issued by quasi-government agencies and multilateral institutions is also accepted. ³ Rising to 500 for large borrowers. ⁴ Both new soles and dollars, with the latter more used.

Source: Central banks.

Market operations

Market operations may be conducted by central banks on a regular but infrequent basis, or a number of times a day, depending on whether a corridor or active approach is being used. They fall into five general categories:

- issue of short-term paper (either the central bank's own paper or the government's);
- outright transactions in the secondary market;
- repurchase transactions (repos) against domestic currency assets. In substance (but not legal form) they are equivalent to a collateralised loan. Repos inject liquidity while temporary sales (reverse repos) withdraw liquidity;
- foreign exchange swaps. These are similar to repos but use foreign currency rather than a domestic government bond as the underlying asset. Liquidity can be injected by a spot purchase of foreign currency combined with an equivalent forward sale (and withdrawn by a spot sale/forward purchase);
- interbank market transactions, including taking deposits or making loans.

Some central banks also use transfers of government deposits as a quasi-market operation.

Table B2 shows that in both advanced and emerging economies the most widely used instruments are repos (and reverse repos), followed by outright purchases and sales of bonds.

Deciding on the mix of instruments to use depends on many factors: the costs and flexibility of transactions, availability of paper and state of the public finances. It may be easier to send clear signals to the market if just one or two particularly visible instruments are used, while greater flexibility would argue for using a wider range of instruments. Opening up the banking market to foreign banks may be more successful if they are presented with instruments and procedures with which they are familiar.

Outright transactions

Markets for short-term paper may be more commonly used as they are more liquid than those for longer-term paper. Government and central bank securities are generally regarded as involving no credit risk and thus are easier to use for market operations. (However, in some crises, default may be considered a real possibility, which would greatly complicate such operations.) They also avoid possible complications from buying private sector paper. Counterparties may try to offload riskier paper, and as Axilrod (1995) argues, "the central bank would find it difficult to avoid purchasing at least some of the paper; if it refused, the market itself would turn away from the paper on the thought that the central bank has access to information unavailable to the market generally (as in practice it may well have)". Well respected credit ratings might help avoid such problems but they are not available in all emerging economies. The imprimatur associated with being acceptable to the central bank could narrow credit spreads of that class of private sector paper, making them less reflective of their underlying risk. Among private issuers, the central bank may prefer to restrict itself to the banks about which it is better informed. The choice of paper for market operations may also be affected by changes in taxation arrangements, as noted by Bisignano (1996).

Separation of debt management and monetary management

The importance of the government "fully funding" its budget (ie issuing sufficient securities to the private sector to cover any deficit) and thus giving the central bank effective control over the supply of bank reserves is emphasised by Stebbing (2003). This separates monetary and debt management. It usually requires the government to auction its bonds. This has the advantage of imposing fiscal discipline as the interest rate consequences of high government borrowing are clear. It also makes the issue of government debt more predictable. Moreover, it can remove conflicts of interest as the central bank might want high interest rates to dampen inflation while the debt manager might prefer low interest rates to reduce servicing costs. Countries are increasingly separating these two functions.

Table B2

Types of market operations employed (as at late 2003)

	Issue of CB paper	Issue of govt paper	Purchase and sale of bonds	Repos	Reverse repos	Foreign exchange swaps	Taking deposits/ borrowing	Loans	Transfer of govt deposits
<i>Percentage of emerging economies</i>									
Employed	68	9	55	82	73	32	41	27	5
Most important	23	0	5	55	5	5	5	0	0
<i>Country details (most commonly used operations in bold)</i>									
China	Yes								
India			Yes	Yes	Yes	Yes			
Indonesia	Yes						Yes		
Korea	Yes		Yes	Yes	Yes				
Malaysia	Yes		Yes	Yes	Yes		Yes		Yes
Philippines			Yes	Yes	Yes		Yes		
Singapore			Yes	Yes	Yes	Yes	Yes	Yes	
Thailand	Yes	Yes	Yes	Yes	Yes	Yes			
Argentina	Yes								
Brazil	Prohibited		Yes	Yes	Yes				
Chile	Yes		Yes	Yes	Yes	Yes			
Colombia		Yes		Yes	Yes				
Mexico	Yes							Yes	
Peru	Yes			Yes		Yes	Yes		
Venezuela	Yes			Yes	Yes				
Czech Republic	Yes			Yes	Yes				
Hungary	Yes		Yes	Yes	Yes		Yes	Yes	
Poland	Yes		Yes	Yes					
Russia			Yes	Yes	Yes		Yes	Yes	
Israel	Yes					Yes	Yes	Yes	
Saudi Arabia				Yes	Yes				
South Africa	Yes			Yes	Yes	Yes			
Turkey	Yes		Yes	Yes	Yes		Yes	Yes	
Australia			Yes	Yes		Yes			
Canada				Yes	Yes				Yes
Euro area			Yes	Yes	Yes	Yes	Yes		
Japan			Yes	Yes	Yes				
Sweden	Yes			Yes	Yes				
Switzerland				Yes	Yes	Yes			Yes
United Kingdom		Yes	Yes	Yes		Occasional			
United States			Yes	Yes	Yes				

Sources: Central banks; Economist Intelligence Unit.

Auction procedures

Outright transactions (and other forms of market operations) generally involve some kind of auction. A key question is whether to fix volumes or prices. Some central banks prefer to set prices to give a clear signal. In practice, fixed rate auctions can mimic variable rate auctions as tendering can be frequent and the central bank can adjust the rate from tender to tender in response to the volume demanded. Some central banks (such as the Central Bank of Malaysia, the South African Reserve Bank and formerly the Deutsche Bundesbank) generally use variable rate auctions but switch to fixed rate auctions when they want to send a particularly strong signal to the market.

A second issue is the auction type. In multiple price auctions (sometimes known as “discriminatory price” or “American” auctions), there may be a “winner’s curse”. A bidder may find they have paid too much and make a loss in secondary trading. This is avoided in single price auctions, where all successful bidders pay the same price (sometimes known as a “uniform price” or “Dutch” auction). So while a single price auction may appear to be less attractive to the issuer (as the keenest bidders pay less than under a multiple price auction), it may attract more bidding. However, single price auctions may provide greater incentives for collusion in thin markets. There are also concerns that a very low bid by the marginal successful bidder could set the price, especially in underdeveloped markets where there may be few bids relative to the size of the auction. Multiple price auctions appear to be becoming more prevalent (as they are for primary auctions of government securities) but single price auctions may be better in less developed and illiquid markets where bidders may be more unsure about the likely market price. See Mohanty (2002) for further discussion.

The counterparties allowed to participate in auctions may be limited due to credit risk concerns, particularly in the “active” model, under which auctions may be frequent and quick. They have to meet certain obligations, such as providing information, offering two-way quotes at limited spreads, or (as in Turkey) purchasing minimum quantities of bonds, in exchange for the privilege. As computers reduce the logistical difficulties of dealing with a large number of counterparties, there is less reason to have a small group of dealers.

Repurchase transactions

Repos come in a variety of forms (such as sell/buybacks, securities borrowing, special collateralised loans) that are equivalent for monetary policy purposes but reflect the legal and institutional framework prevailing in various economies. Repos have become the main policy instrument in many economies. No link is necessary between the maturity of the repo and that of the underlying securities, and repo transactions do not directly affect prices in the bond market. Features such as amount, maturity, frequency, disclosure and tender system can be varied to suit the circumstances. For temporary adjustments, a single repo will be cheaper than two outright transactions. Repos allow central banks to limit their risk while expanding the range of assets in which they transact. They also have the advantage for central banks that injections of liquidity are reversed automatically when they mature.

Generally, government and central bank paper are eligible for repos (Table B3). In some cases bank or other higher-quality private sector paper can be used. Widening the range of acceptable paper may be prompted by a desire to develop the secondary market in these securities (as in India) or by the fact that the government securities markets are illiquid (as in Israel and Poland). In general the maturities of repos are fairly short; often less than two weeks. Central banks in most advanced economies mark collateral backing repos to market daily and may require counterparties to post additional collateral.

Foreign exchange swaps

A foreign exchange swap involves two counterparties exchanging specific amounts of different currencies and agreeing to repay at a fixed rate on a fixed date. It is equivalent to a spot purchase of foreign exchange and a forward sale. The effect of (say) a purchase by the central bank is to increase the sum of domestic currency bank reserves. When domestic securities markets are not broad but the foreign exchange market is very liquid, using a swap may be the best way for the central bank to affect the level of bank reserves. At the same time, since the spot transaction in foreign exchange is offset by the futures transaction, it also avoids exerting a direct influence on the spot exchange rate (although there may be a signalling effect). The use of swaps may also help develop a deeper and better functioning foreign exchange market; see Hooyman (1993) and Blejer and Schumacher (2001).

Table B3

Types of securities used in market operations

Percentage of central banks using the instrument (as at late 2003)

	Central bank paper	Central govt bills ¹	Central govt bonds ²	State/ regional govt paper	Other govt guaranteed paper	Commercial bank paper	Other private sector paper
Outright operations							
Emerging economies	68	63	42	5	16	11	11
Advanced economies	17	83	17	17	33	50	33
Repo operations							
Emerging economies	70	90	60	5	25	5	0
Advanced economies	25	100	13	88	88	75	75

¹ Maturity up to 12 months. ² Original maturity over 12 months.

Source: Central banks.

However, there are risks in their use. The value of the underlying asset - foreign exchange - may be volatile, which may lead the counterparty to default. Extensive use of swaps (and other derivatives) may also make the central bank's published balance sheet misleading. This may tempt the central bank to delay monetary policy changes. Foreign exchange swaps involve Herstatt risk when transacted across time zones, as one party might not be able to receive the counterparty's currency after delivering its own. The creation of the Continuous Linked Settlement Bank should remove this risk for those currencies for which it operates. Another problem in some countries is shallow forward markets. There may be few counterparties and the market might not be able to generate market prices for swaps. The central bank would then be determining the swap rate.

In Singapore and Switzerland, swaps are the main instruments for monetary policy operations, perhaps reflecting the long history of budget surpluses and the large amounts of bonds held until maturity by large investors, which tends to lower the liquidity in government bond markets. They have also been extensively used in Israel and South Africa.

Transfer of government deposits

Movement of government deposits between the central bank and commercial banks is an important monetary policy tool in Canada. Similarly, Malaysia has sometimes transferred assets from its Employee Provident Fund to the central bank to sterilise capital inflows. Singapore has used its Central Provident Fund in a similar manner. In Saudi Arabia, funds of government institutions placed with the central bank are sometimes used in a similar way. It is not a market-based technique, and does not help develop financial markets; see Quintyn (1994).

Table B4

Aspects of the bank reserves market (as at late 2003)

	Planning horizon for managing bank reserves market	Least predictable item	Typical frequency of market operations	Bank reserves as a % of bank deposits¹	Settlement system for large-value items
China			1 or 2 per week	10	RTGS
Hong Kong SAR	2 days	C		0	RTGS
India	1 day	G,C	Daily	5	DTNS ²
Indonesia	1 week	G	Daily	9	RTGS
Korea	15-16 days	G	Weekly	4	RTGS
Malaysia	2 weeks	G	Twice a day	17	RTGS
Philippines		G	Daily	11	RTGS
Singapore	No formal forecasts	G?		4	RTGS
Thailand	1 month	G	Twice a day	4	RTGS
Argentina	3 months	G	Twice a week	21	RTGS
Brazil	1 month	C,G	Daily	42	RTGS
Chile	1 month	C	Twice a week	5	DTNS ²
Colombia	2 weeks	G	Twice a day	7	RTGS
Mexico	2 months	C	Daily	17	RTGS
Peru	1 month	C	Weekly	32	DTGS
Venezuela	1 year	G	Daily	25	DTNS
Czech Republic	5 days	NOA	Daily	3	RTGS
Hungary	18 months	G	Weekly	9	RTGS
Poland	Weekly, monthly	G	Weekly	6	RTGS
Russia	1 month	G	Twice a day	26	DTGS
Algeria				10	
Israel	1 month	G	Daily	10	DTNS
Saudi Arabia		F		7	RTGS
South Africa	7-30 days	C	Weekly	4	RTGS
Turkey	2 weeks	C,R	Daily	22	RTGS
Euro area	10 days		Weekly	...	RTGS
United Kingdom	13 weeks (focus on next 2)	C	Twice a day	1	RTGS

G = government. C = currency. F = net foreign assets. NOA = net other assets. R = bank reserves. RTGS = real-time gross settlement. DTNS = deferred time net settlement. DTGS = deferred time gross settlement.

¹ As at June 2003; ratio of line 20 to sum of lines 24 and 25 in IMF *International Financial Statistics*. ² RTGS expected in 2004.

Sources: Borio (2001); central banks; CPSS.

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Local complications of global economic integration: privatisation receipts and volatile export earnings

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Introduction

This paper discusses two complications for domestic monetary policy stemming from greater international integration of the emerging market economies: privatisation-related capital inflows and large swings in export earnings. The macroeconomic consequences of foreign exchange inflows from these two sources are in many ways similar to those of other capital inflows: inflationary pressures, real exchange rate appreciation and possibly widening current account deficits. Yet experience has shown that the privatisation-related inflows and large swings in export earnings are different due to their relative size and their political economy implications. Because of these features, standard monetary tools to deal with capital inflows may have to be supplemented by unconventional policy tools such as special privatisation accounts and export earnings stabilisation funds.²

The paper is divided into three sections. Section 1 discusses why foreign exchange inflows from privatisation receipts and large swings in export earnings differ from other capital inflows, and why conventional monetary policy tools may not be fully effective in dealing with such inflows. Sections 2 and 3 review experience with the use of, respectively, special privatisation accounts and export earnings stabilisation funds.

1. Background

Characteristics of privatisation receipts and volatile export earnings

The first feature that distinguishes foreign exchange inflows related to privatisation and volatile export earnings is their size and variability. In the early and mid-1990s, privatisation proceeds for a group of 20 large emerging market economies were on average 1¾% of GDP a year during the active privatisation period (which on average lasted five years), and the standard deviation of the ratio of privatisation proceeds to GDP was on average half a percentage point.³ This is considerably higher than in the case of privatisation in industrial economies such as the United Kingdom and France. Moreover, about 40% of privatisation receipts in the emerging economies between 1990 and 1998 were paid in foreign exchange. This proportion has increased significantly in the period since 1998, as many commercial banks and non-bank financial institutions in emerging markets have been acquired by strategic foreign investors.

Swings in commodity prices lead to massive year-to-year changes in export earnings. Oil exports, for instance, accounted on average for two thirds of total exports and 23% of GDP in OPEC members during 1996-2002 (see OPEC (2003)), while the standard deviation of the ratio of oil exports to GDP was 4½ percentage points. This is extremely large relative to total GDP volatilities in industrial countries (about 2%) or even developing countries (3-4%): see Hausmann and Rigobon (2003).

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² Other uses of stabilisation funds, such as managing earnings from non-renewable resources in order to create a store of wealth for future generations, are not discussed in this paper.

³ Calculated from the data presented in Davis et al (2000).

The second distinguishing feature of privatisation-related inflows and volatile export earnings is the political economy of such inflows. The experience from central and eastern Europe and Latin America during the 1990s has shown that not only does privatisation have a direct impact on the public finances and money supply, but it also has a major impact on the development of the financial sector and more broadly on political and institutional stability. It may even affect the path of economic development: see Roland (2000). For instance, new owners of privatised enterprises often finance additional investment with foreign capital. Successful privatisation programmes may thus signal favourable changes in the policy regime and in growth prospects, which may in turn trigger capital inflows not directly related to the privatised enterprises. In Argentina, for example, the rapid and large-scale privatisation programme of the early 1990s and the use of part of the receipts to reduce public debt conveyed a signal to markets about a change in the policy regime that subsequently contributed to large capital inflows.

Similarly, how a country manages revenues from exports of its key resources has major implications for its macroeconomic stability and economic development. If policymakers ensure that export proceeds are spent so as to enhance the growth potential of the economy, the country will be better placed to deal with uncertain revenues and avoid boom-bust cycles. If the export proceeds are spent unwisely, the economy may succumb to the so-called “resource curse”: see Eifert et al (2003).

One should emphasise that large swings in export earnings are characteristic not only of commodity-exporting countries. Several emerging economies have exports concentrated on a few manufactured goods such as electronics, or on tradable services such as computer software and tourism. Such countries increasingly face large swings in export earnings due to unpredictable changes in world demand. Moreover, swings of this kind are more or less a permanent feature of their economies, given the high fixed costs associated with specialisation. At the same time, many emerging market economies (eg India and China) have yet to face the challenge of large-scale privatisation, while in others the ongoing programmes have not run their full course. Even in new member states of the European Union, for instance, the privatisation of sectors such as transportation and energy has only just begun. Thus, in the period ahead privatisation-related inflows and large swings in export earnings are likely to pose persistent challenges to monetary policy in the emerging market economies.

Monetary and exchange rate implications

The monetary consequences of privatisation-related inflows are similar to those of other capital inflows. In particular, privatisations to non-residents tend to have an expansionary effect on monetary aggregates because of the associated inflows of foreign exchange. Privatisations to residents have a more ambiguous effect because they usually represent an exchange of a resident's domestic financial assets for the state's real assets. Any expansionary effect in such circumstances would depend on how the government spends the proceeds, how the residents finance the purchase of state assets, and whether the new owners make additional investments in firms they acquire, and how these investments are financed.

The expansionary effect of privatisation-related inflows is largely the consequence of the so-called *stock-flow constraint* in emerging economies: see Sinn and Sinn (1993). Given the absence of significant pre-existing wealth (in particular in transition economies) at the beginning of large-scale privatisation programmes, the stock of state assets could be sold either against the flow of annual savings of the population (plus any stock of existing savings, often held in foreign currency outside the banking system) or to foreign investors.⁴ In either case, the sale of state assets is accompanied by foreign exchange inflows to the domestic financial system.

The monetary consequences of volatile export earnings are equally pronounced. For instance, if foreign exchange earnings from oil exports are converted into domestic currency and spent on non-tradables, which is often the case in emerging economies, this can lead to exchange rate appreciation and weaken a country's export competitiveness. Policymakers then face a dilemma: they

⁴ The stock-flow constraint could in principle be relaxed through the import of capital by residents. However, informational constraints severely limit the access of emerging economy residents to international capital markets for such purposes. In any case, from the monetary policy perspective the consequences of asset purchases financed by foreign borrowing would be similar to direct asset sales to foreigners.

can let the nominal exchange rate appreciate and risk a loss of competitiveness for their non-oil sector, or the central banks can buy up the foreign exchange earned from oil exports and increase foreign reserves to avoid a nominal appreciation. The latter could create excess liquidity in domestic currency and may still result in real exchange rate appreciation.

How can monetary policy deal with these consequences of privatisation-related inflows and large swings in export earnings? In general, conventional sterilisation methods are likely to be less effective or have undesirable consequences if applied to very large and unpredictable shocks to liquidity.

In particular, markets in government or central bank securities in emerging economies are rarely so deep and so liquid as to allow the central bank to absorb via open market operations a sudden inflow of privatisation receipts equivalent to, say, 2-3% of GDP. Moreover, the costs of sterilisation in such cases may be substantial and lead to large operating losses for the central bank. If the central bank needs to raise interest rates in order to conduct such open market operations, this may give rise to short-term capital inflows seeking to exploit the differential between domestic and international interest rates. The adjustments in discount rates or (remunerated) bank reserves that are necessary to absorb a sudden increase in liquidity may be so large and so costly to the central bank as to make these tools impracticable. These disadvantages, together with the persistence of privatisation-related inflows (at least during active privatisation periods) and swings in export earnings make conventional sterilisation operations at best a short-term policy option.

Somewhat more promising options are to require banks to hold liquid assets abroad (see Ize (1996)) or to shift public sector deposits from commercial banks to the central bank. Where public sector deposits account for a large proportion of the banking system's deposits (eg in China, Malaysia, Russia and Thailand), the latter method has been highly effective in sterilising the inflows: see Lee (1996). However, frequent transfers of government deposits from and to commercial banks create uncertainty for the banks. Moreover, the central bank must ultimately be able to convince the government or other public sector entity to spend the funds deposited in a way that would not disrupt the foreign exchange and money markets. This raises the question whether other approaches that require cooperation between the central bank and fiscal authorities, such as special privatisation accounts or export earnings stabilisation funds, would be more effective in stabilising the impact of such flows. This question is further explored in the next section.

The second major monetary policy implication of privatisation receipts and volatile export earnings stems from the political economy characteristics of such flows. For a country where shocks to the foreign exchange market and money supply represent several per cent of GDP a year and where inappropriate use of government funds may disrupt macroeconomic stability, there is a clear need for coordination of monetary and other macroeconomic policies. Even though the main role in managing privatisation revenues and resource wealth belongs to fiscal policy, central banks need to take account of the profound implications of the management of these resources for monetary and exchange rate policy. As noted above, even when a large part of the inflows accrue to the government and government deposits are held with the central bank, the central bank still needs to agree with the government on measures that will smooth the withdrawal of deposited funds. Central banks may thus have to play a proactive role in devising solutions for smoothing the volatile flow of foreign exchange revenues and convincing other policymakers of the merit of such solutions.

2. Dealing with privatisation-related inflows

This section first reviews conventional monetary policy responses to foreign exchange inflows stemming from privatisation, and then looks at an alternative that has been successfully used in some transition economies: special privatisation accounts.

Conventional approaches

The precise effects of privatisation receipts depend on the uses of such receipts. One approach would be to use the privatisation proceeds to pay off public sector external debt. This policy automatically redirects the inflows abroad and so limits the impact on the local economy. External debt reduction also lowers the debt-related risk premium. A potential disadvantage from the perspective of monetary management is that, like a successful privatisation programme, debt repayment may signal an

improvement in the investment climate and trigger other capital inflows, thus increasing rather than eliminating the need for sterilisation. If additional inflows are foreign-financed investment programmes in privatised enterprises, such inflows may contain a large import component, particularly if new technologies are being introduced. To that extent, the inflows would be automatically “sterilised” through deterioration in the current account.

The repayment of debt owed by the government to the central bank would have the same advantages for monetary policy as the repayment of external debt (ie limited impact on the local economy). But the repayment of debt to other domestic creditors (or settlement of arrears) might require the central bank to sterilise any resulting increase in domestic liquidity.

Where privatisation proceeds are placed in public sector accounts and how they are used has important implications for monetary policy. For instance, it is generally recommended that the privatisation proceeds be fully reported in the official budget and not hidden in some extra-budgetary account. Nevertheless, as discussed below, the use of special privatisation accounts, in particular if held with the central bank, does offer some advantages - from both monetary management and political economy perspectives - over the placement of privatisation proceeds in the government budget.

Table 1
Use of privatisation proceeds

Debt retirement	Capital expenditure	Settling of liabilities of privatised firms	Social safety nets	Other structural reforms (eg pension reform)	General expenditure (proceeds not earmarked for specific use)	Other
Hungary Korea (13%) Israel	Korea (21%) Peru (4%) Thailand	Czech Rep Thailand	Peru (20%) Philippines Turkey (1%)	Peru (1%)	Argentina Colombia Hong Kong SAR (100%) Hungary Israel Mexico Malaysia Colombia Peru (2%) Philippines Poland Saudi Arabia South Africa Turkey (7%)	Korea (66%) Philippines Thailand Turkey (66%)
Mexico Peru (73%) Poland Saudi Arabia Thailand Turkey (13%)	Turkey (14%)					
Number of countries: 9	4	2	3	1	14	4

Source: Central bank responses to BIS questionnaire.

Another standard recommendation is not to treat privatisation proceeds as recurrent income because such receipts reflect an exchange of assets and as such are lumpy, transient and uncertain. Finally, earmarking privatisation receipts for specific uses, which could be potentially attractive from the political economy perspective, complicates fiscal management and makes it difficult to reallocate

spending in response to changes in circumstances and priorities. As such, the practice of earmarking privatisation receipts is generally discouraged.⁵

To what extent have emerging economies followed the conventional advice? As indicated in Table 1, several countries (including Hungary, Korea, Israel, Peru, Poland, Saudi Arabia, Thailand and Turkey) have actually used privatisation proceeds to pay off public sector debt. But most countries have used the privatisation receipts for general government expenditure or for capital spending and other unspecified uses. The use of earmarking to cushion the short-term social impact of privatisation or to facilitate structural reforms has been limited. Only the Czech Republic and Thailand have apparently used privatisation proceeds to settle liabilities of divested firms.

Table 2 indicates further discrepancies between policy recommendations and practice with regard to privatisation proceeds. While many countries channel the proceeds of privatisation through the government budget, many have kept the proceeds outside the budget. The majority of countries have also treated privatisation proceeds as a revenue item in the budget, with only a few - Argentina, Hungary, Israel, Peru, Poland and South Africa - following the advice to treat such proceeds as a financing item.

Table 2								
Placement and recording of privatisation proceeds								
Placement of proceeds						Recording of proceeds placed in the budget		
Budget		Privatisation agency	Special account		Other	Revenue	Financing	Other
Central government	Sub-national governments		At central bank	At other agency				
Argentina Chile Hong Kong SAR Israel Korea Mexico Malaysia Peru Philippines Poland Saudi Arabia South Africa Thailand	Argentina	Hungary Korea Peru Turkey	Czech Rep Peru Philippines ² Poland	Peru Philippines Thailand ³	Hong Kong ¹ Peru	Argentina Chile Hong Kong SAR Korea Mexico Malaysia Philippines Saudi Arabia Thailand	Argentina Hungary Israel Peru Poland S Africa	Argentina
Number of countries: 13	1	4	4	3	2	9	6	1

¹ The proceeds are placed in a government account with a bank not owned by the government. ² Foreign currency deposit account of the National Treasury with the central bank, used for privatisation receipts in foreign currency. ³ Used for repayment of part of government debt.

Source: Central bank responses to BIS questionnaire.

⁵ Targeted use of the proceeds to help cushion the short-term social impact of privatisation may be appropriate, however. Privatisation proceeds might also serve a useful role in providing a temporary cushion for countries pursuing comprehensive structural reforms, in particular if the country faces high borrowing costs.

Special privatisation accounts

As indicated in Table 2, many emerging market economies have channelled at least part of the receipts from the sale of state assets through special privatisation accounts set up at the central bank or other government agencies. Perhaps the most articulated use of this approach can be found in the Czech Republic, although similar approaches have also been explored in Poland, Hungary and Peru.

As discussed by Böhm and Ždárský in the accompanying paper in this volume, the Czech koruna sharply appreciated following the sale of a large commercial bank to a strategic foreign investor in late 1999, and an official announcement that a large proportion of state-owned real estate would be privatised beginning in the second half of 2000. Fears that the exchange rate might overshoot and subsequently fall back led the Czech National Bank to agree with the government on a joint strategy for dealing with future large privatisations and other capital inflows: see Czech National Bank (1999). One element of this strategy was a commitment by the government not to issue foreign currency denominated bonds for one year.

The main element, however, was the establishment of a special privatisation account in which the foreign exchange proceeds from the large sales of state property were to be deposited. Any conversion of the funds withdrawn from this account into domestic currency was done outside the foreign exchange market: the Czech National Bank would purchase the foreign exchange from the government at the prevailing market exchange rate and transfer the foreign exchange to its international reserves. Because the transaction was not intermediated in the domestic foreign exchange and money markets, it did not affect the exchange rate or the interest rate. The government spent most of the proceeds on housing and infrastructure development, which helped smooth the impact on aggregate demand.

The growing deficits in the public finances in 2000 and 2001, however, made it difficult for the government to stick to its agreement with the Czech National Bank. In 2000 and 2001, only about 50% of the privatisation proceeds were converted into domestic currency via the privatisation account. Further sharp appreciation of the koruna in late 2001 and early 2002 prompted the Czech National Bank to press harder for the government's compliance with the agreement on the privatisation account. This resulted in a reinforced agreement that established an inventory of the government's existing and potential foreign exchange commitments; provided for the payment of part of the future privatisation proceeds in domestic currency; and set terms for compensation by the government of the losses the Czech National Bank incurred in sterilising the privatisation proceeds - see Czech National Bank (2002). This agreement was fully respected and the sharp appreciation of the koruna was thereby halted - see Czech National Bank (2003).

Poland used a similar approach. The Ministry of Finance opened a special foreign exchange account for privatisation proceeds at the National Bank of Poland. However, this account was used not only to deposit the privatisation receipts in foreign currency, but also for the funds obtained from the issuance of Polish government eurobonds, from the sale of collateral from Brady bonds and from other similar operations. As in the Czech case, one reason for setting up this account was to avoid injecting large volumes of privatisation proceeds into the still shallow foreign exchange market. Another reason was to use the funds in the account to service the external debt of the public sector. Direct transactions via the special account were considered less disruptive for the foreign exchange market than government purchases of the foreign currency from the central bank. As in the Czech case, the use of the privatisation account reduced exchange rate volatility, but considerably increased fluctuations in the central bank's foreign reserves.

Privatisation proceeds in *Hungary* are booked as revenues of the Hungarian Privatisation and State Holding Company. If such revenues exceed the planned amount, the surplus is used to reduce the central government's liabilities to the central bank, which then uses these funds to pay back its own foreign debt. In the event, the greater part of revenues from privatisation have been used to reduce the foreign debt.

In *Peru*, the authorities established special rules to improve the administration of the privatisation proceeds and enhance transparency. About 25% of the proceeds from sales of state-owned property (one half in 2001) were deposited in the Fiscal Stabilisation Fund at the central bank, while another 50% were deposited in a special treasury account. The funds in the treasury account were in turn used mainly for public debt retirement.

Some other Latin American countries were less successful in managing privatisation proceeds. In *Mexico*, the bulk of privatisation receipts in the early 1990s were deposited in a special account at the

central bank and used for repayment of government debt. However, the parliament became aware of this practice, and demanded that privatisation proceeds be channelled through the state budget. Once this was done, the funds became subject to political bargaining and were used for public projects. In *Argentina*, although privatisation proceeds were occasionally used for debt repayment, it was very difficult for the central bank to obtain approval for a more permanent arrangement to “freeze” privatisation revenue.

The conclusion is that experience with the use of special privatisation accounts seems to have been positive, but success requires perseverance by the central bank in devising and implementing the rules of engagement, and, not least, the understanding and cooperation of the fiscal authorities and the main political constituencies.

3. Large swings in export earnings

Large and volatile revenue streams from exports of oil, non-oil commodities and other specialised goods and services can create a number of complications for domestic monetary policy. During upturns, such exports generate shocks that can affect the exchange rate through disposable income and wealth effects, through procyclical government spending on non-tradables, or through capital inflows.⁶ During downturns, countries with heavy reliance on volatile export revenues may have substantial financing needs. International lending to such countries, however, tends to be procyclical. Countries may therefore place a premium on liquidity and may wish to hold a large stock of liquid financial assets to avoid passing on the shock to the domestic private sector. But this has the disadvantage of complicating domestic monetary policy.

These considerations, as well as the difficulty of sterilising “excess” foreign exchange inflows with conventional monetary tools, have led to alternative approaches to managing large swings in export earnings, such as export revenue stabilisation funds.

- *Contingent stabilisation funds* are designed to accumulate resources when the export commodity price or revenue exceeds some threshold, and to pay out when the price or revenue falls below a second threshold. The thresholds are usually preannounced. By transferring uncertainty and volatility to the fund, recurrent resources available to the budget are made more predictable and stable.
- In a *financing fund* the operational rules are designed so that the fund effectively finances the overall budget balance. The fund accumulates assets to the extent that there are actual surpluses in government finances. A separate institutional structure for the management of the fund is not required because all revenues and expenditures can be managed in a special government account. Russia, for instance, has operated such a “virtual fund” in recent years (see below).

Although export revenue stabilisation funds offer many advantages, their design raises complex operational issues. Only a few are mentioned here.⁷

- Stabilisation funds provide no guarantee against the volatility of expenditure, as governments could still borrow in good times in order to finance additional spending. Expenditure smoothing requires additional fiscal policy decisions besides the operation of the fund.
- Adequate price or revenue rules, which signal the need to accumulate or withdraw assets from the fund, may be difficult to establish.

⁶ There is evidence that a volatile real effective exchange rate can reduce capital formation as well as non-traditional exports: see World Bank (1993).

⁷ For additional issues see Davis et al (2003).

- While financing funds provide an explicit link between budget outcomes and accumulation of assets in the fund, they do not attempt to deal directly with the problems posed to the budget by the volatility of resource revenues.
- An effective stabilisation fund would also need to have a clear asset management strategy that is coordinated with other government financing operations.
- A case may exist for placing the assets of a stabilisation fund abroad, since investment in domestic non-governmental financial assets could transmit resource volatility to the economy.

Country experiences with the use of export revenue stabilisation funds have been mixed.⁸ *Chile's* copper stabilisation fund was established in 1985 following a sustained increase in the international copper price. The fund's accumulation and withdrawal rules are based on a reference copper price determined annually by the authorities. No explicit formula is used to calculate the reference price. Information on the fund's assets is not publicly available, but it is understood that the resources of the fund grew substantially after 1987, and that significant withdrawals took place beginning in 1998 due to a sharp downturn in copper prices. By 2002, the resources of the fund had been exhausted and the fund had to be replenished: see Davis et al (2003). As Chile's macroeconomic and fiscal policies have been generally sound, the main advantage of the copper stabilisation fund has been to help the government resist expenditure pressures during upswings in copper prices in the late 1980s and the mid-1990s.

Venezuela established a macroeconomic stabilisation fund in 1998 with the objective of insulating the budget and the economy from fluctuations in oil prices. Initially, the rules for transfers to and from the fund were relatively strict. Resources could be drawn from the fund only if oil revenues in a given year were below a reference value or for foreign debt repayment (if resources in the fund exceeded 80% of the five-year moving average of oil export revenues). The assets of the fund had accumulated to 7% of GDP by 2001. In subsequent years, however, the rules were substantially relaxed, so that by 2003 the assets had fallen below 1% of GDP. Recently, the government even had to borrow at high cost to meet the (loosened) fund regulations. The rule that the state oil company PDVSA (which accounts for 77% of Venezuela's exports) must sell foreign exchange proceeds to the central bank has proved much more effective in stabilising the exchange rate, although it has complicated monetary policy under the current regime of exchange controls. The central bank has also used (with apparent success) an interest rate operating target to smooth large fluctuations in domestic liquidity resulting from volatile oil export revenues.

Mexico established a small oil stabilisation fund in 2000. The fund's rules envisage that a proportion of total federal government revenue (which includes oil revenues) in excess of budgeted amounts is to be deposited in the fund. The accumulated resources can be used to compensate the budget for revenue shortfalls. As in the case of Venezuela, however, the use of a mandatory foreign exchange surrender requirement has in practice proved more effective than the stabilisation fund itself. In particular, the state-owned oil company Pemex, which has domestic monopoly in the extraction, production and sale of crude oil and most of its derivatives, has to conduct all foreign exchange transactions through the central bank (which, in turn, uses part of the proceeds for repayment of Mexico's foreign debt) rather than the foreign exchange market. Pemex, however, has the discretion to determine the amount and timing of such operations, but has to give the central bank advance notice of transactions that might have a major impact on domestic liquidity. In an effort to limit the carrying costs of foreign reserve holdings, the central bank has resorted to the sale of dollars at a predetermined rate when the growth of foreign reserves exceeds a certain threshold.⁹

⁸ See Fasano (2000) and Davis et al (2003) for more detailed reviews, focusing in particular on fiscal issues.

⁹ On a quarterly basis, the Bank of Mexico publishes in advance the amount of dollars to be offered in the exchange market during the next quarter. The amount of dollars to be auctioned equals 50% of the international reserve flows accumulated in the previous quarter (after considering the total number of offerings made via this mechanism during the same period). Depending on the amount of dollars to be offered, auctions a fixed amount of US dollars every day on a predetermined schedule. Daily offerings are determined based on the number of working days in the quarter in which auctions will be held. For example, if \$1.5 billion will be sold during a quarter with 60 working days, the daily amount to be auctioned will be \$25 million.

Since monetary policy in Mexico is conducted within an inflation targeting framework, the central bank has to sterilise foreign exchange inflows related to oil revenues. Given the lack of government paper, the central bank started over time to issue its own instruments. However, this was not sufficient to absorb the liquidity and may have led to some crowding-out in the local bond market. The central bank was thus compelled to use, in addition, mandatory deposit requirements for commercial banks. However, this led to losses as deposits were remunerated from the central bank's own resources.

Colombia has also used an oil stabilisation fund to smooth the flow of proceeds from oil exports. All the proceeds of this fund are kept abroad, thus insulating domestic foreign exchange and money markets from fluctuations in oil revenues. The experience with oil revenue has not always been positive, however. When a major oil field was discovered in 1991, much of the resulting revenue was spent, raising government expenditure to 35% of GDP from 21% within a few years. On the other hand, the country had a positive experience with a coffee stabilisation fund, which has operated since 1944, bringing considerable stability to the economy during the fixed exchange rate regime.

An oil stabilisation fund in *Algeria* was established in 2000. The fund receives deposits when oil revenues exceed budgeted amounts, calculated around the reference value of \$19 per barrel (a 15-year average price of Algeria's oil exports). Withdrawals are made to repay public sector debt, finance public investment, or - in the case of hydrocarbon revenue shortfalls - to finance other expenditures. Public expenditure itself is planned so as to be in balance with revenues when the price of oil is at \$19 per barrel. At end-2001, the resources in the fund amounted to about 6% of GDP. Transmission of shocks to domestic liquidity is reduced through a 100% foreign exchange surrender requirement, capital controls and, when necessary, changes in minimum bank reserve requirements. In contrast to many oil-exporting countries, Algeria had success in managing its oil revenue even before the oil stabilisation fund was established. Since 1989 fiscal policy has been managed in a medium-term framework. Much of the revenue has been used to diversify the hydrocarbon sector and, except for the crisis in 1994-98, fiscal discipline has been maintained.

High oil and gas revenues have translated into a particularly acute monetary dilemma in *Russia*. Oil exporters (mostly privately owned companies) and the state-owned gas giant Gazprom, which currently supplies one quarter of all gas on the world market, have earned substantial foreign exchange receipts since 2000: see OECD (2002). A large part of the receipts had to be converted to roubles under a mandatory foreign exchange surrender requirement. The central bank has resisted nominal exchange rate appreciation and has been buying most of these proceeds. This policy has led to an increase in the central bank's foreign reserves to \$65 billion as of October 2003 from about \$12 billion in 1999. The cost of sterilisation was borne by the government budget and hence was not a constraint on these operations. However, high oil prices in the past two years have confronted the central bank with a dilemma as to how to sterilise the large foreign exchange inflows. Sterilising the inflows with short-term government instruments would probably have required offering higher interest rates on these instruments, which could have triggered additional short-term capital inflows (in particular from hedge funds) that could not ultimately be sterilised.

To address this dilemma, the Ministry of Finance has kept most of its deposits (equivalent to about 40% of broad money supply) in an account with the central bank. By accumulating government deposits and using them for repayment of external debt, the central bank and the government were offsetting what would otherwise have been massive purchases in the foreign exchange market by the central bank. Effectively, they were mimicking the operations of an oil stabilisation fund. Compared with a stabilisation fund, however, the government retained full discretion over the level of savings and was, therefore, faced in each annual budget with the sensitive problem of projecting oil prices for the coming year: see Owen and Robinson (2003). Fortunately, in both 2000 and 2001, oil prices exceeded projections and, with growth and inflation also higher than expected, budgetary surpluses turned out to be much larger than originally targeted. These surpluses relieved the central bank from having to pursue a more active monetary policy.

This approach, however, has led to complaints that the government was "hiding" the oil revenue. Moreover, government balances at the central bank were highly cyclical. In response, the government established an explicit oil stabilisation fund. The fund, which began operations in 2004, accumulates resources when the price of Urals Crude exceeds \$20 per barrel, while withdrawals are permitted when the price falls below this threshold. The total amount in the fund is capped. The fund's resources will be used for external debt repayment and - in case the price of oil stays below \$20 per barrel for more than a year - stabilisation of the government budget. The operation of the fund should help the central bank sharpen its focus on exchange rate policy, as supply and demand will play a greater role in the determination of the exchange rate in a more certain foreign exchange market environment.

In summary, evaluation of country experiences suggests that export earnings stabilisation funds have been associated with a variety of operating rules and monetary and fiscal policy experience. In several cases, rules have been bypassed or changed, and additional rules, such as compulsory foreign exchange surrender requirements, have had to be used to constrain the impact of volatile export revenues on the exchange rate and money markets. Regarding the political economy arguments for such funds, the key problem seems to have been the absence of transparent rules free from political interference, as well as of regular and frequent disclosure of the operations of the funds. The main lesson thus seems to be that export earnings stabilisation funds should not be seen as a simple solution to a complex problem.

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International capital flows in Argentina

Pedro Lacoste¹

1. Capital flows and economic growth

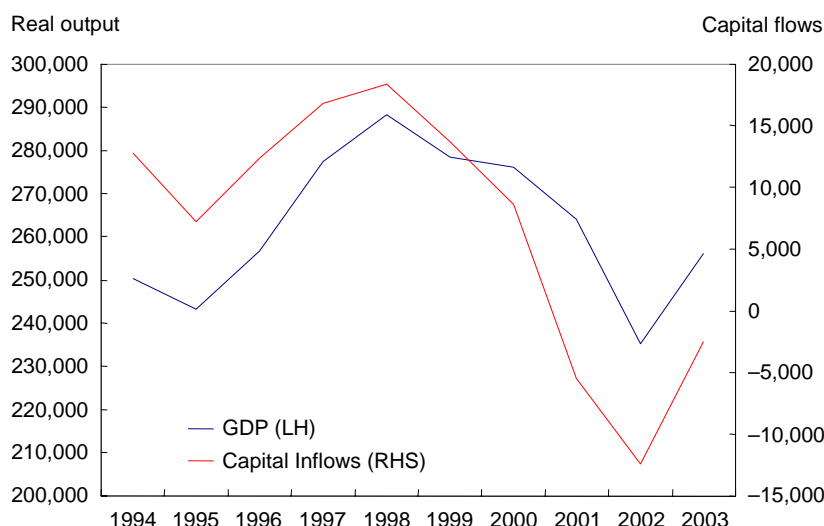
Although there is some discussion as to whether international capital flows move as freely as they did during the heyday of the gold standard, there is general agreement that restrictions on capital flows have declined markedly since the 1970s. Although much of this new freedom of movement comes from more permissive attitudes towards foreign direct investment, it has also included substantially increased movements in short-term portfolio flows. It also seems to be associated with increased episodes of financial and banking difficulties.

The evidence on foreign direct investment (FDI) is quite positive. FDI flows tend to be long lived, only slightly procyclical, and are strongly correlated with long-run growth. In addition, FDI tends to provide technological spillovers, especially in those cases where host country firms are taken on as intermediate input suppliers.

Short-term portfolio investments have been concentrated in a small number of middle income countries. These flows are highly procyclical and quite volatile. A number of countries, Chile for example, have had restrictions on short-term inflows. As a result, they have experienced less capital flow volatility than the regional average, and sustained growth. Rapid withdrawals of short-run portfolio investment have been accompanied by financial and banking crises and severe downturns in output.

The high correlation between international capital flows and recent movements in Argentina's real output seems clear in the data (see Graph 1). High real output growth in the early 1990s accompanied substantial capital inflows. Capital inflows declined substantially during the Tequila crisis of early 1995 and real output fell accordingly. Both output growth and capital inflows recovered in 1996 and remained strong until 1999, after which they declined precipitously through 2002.

Graph 1
Output and capital flows

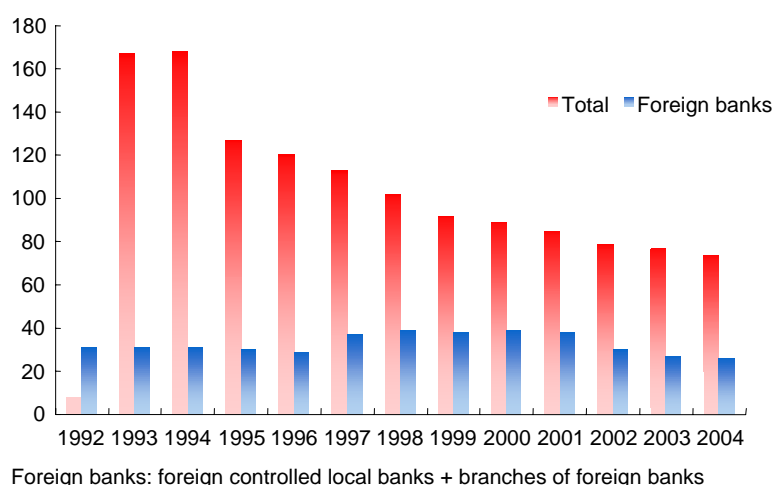


¹ First Vice President, Central Bank of Argentina.

The causal direction that underlies the preceding correlation is not easy to determine. There are good arguments for claiming that the Tequila crisis was an imported (something implied by the very name) or contagion-inspired event. In contrast, there seems to be sound evidence that the ultimate causes of the debt, currency and banking crisis that, strictly speaking, started in 1998 and exploded in 2001-02 were a combination of a rigid peg to the dollar and a persistent dollar appreciation (which undermined competitiveness and employment), along with other aggravating factors such as a sizable increase in the public debt in terms of GDP, the vulnerability of the banking system to a real depreciation due to the explicit decision to allow banks to freely lend in dollars to non-tradable sectors (including the public sector), and a reduction in the willingness of investors to finance emerging market economies in the aftermath of the Russian crisis.

The Mexican (Tequila) crisis of December 1994 had a profound effect on the Argentine banking system, which was reflected in a strong decline in the number of banks after the crisis (see Graph 2). Initially there was a flight to quality, with deposits flowing to the more solid domestic banks, to public banks, and to foreign banks. Later there was a flight from Argentina. Evidence from the period indicates that although most of the banks that suffered runs were less sound, a number of small banks with very high quality loan portfolios also experienced runs. Between the beginning of 1995 and the end of 1999 the number of banks fell from 168 to 92 as a result of closures and consolidations. Most closures occurred in 1995, when the number of banks fell to 127. However, closures in later years were also the result of prolonged financial difficulties caused by the Tequila shock from which the affected banks could not recover. The number of banks has continued to decline and, in mid-2003, there were 76 banks in the system.

Graph 2
Banks in Argentina



The Tequila crisis was triggered by the withdrawal of funds by large depositors from a number of wholesale banks. These banks failed and the panic spread to the rest of the banking sector, affecting mostly smaller banks and those with weaker portfolios. Although the portfolios of public banks were in bad shape compared to the private banks, the public banks were viewed as being backed by the government and did not suffer severe initial runs.

While the liquidity crisis exposed those banks with weak portfolios to runs, the process was satisfactorily managed. The reduction of comparatively large reserve requirements proved to be very useful in dealing with bank runs, and systemic liquidity regulations were substantially strengthened in the aftermath of the crisis. The successful resolution of the crisis enhanced the authorities' confidence in the basic underpinnings of the Convertibility (monetary and exchange) regime, but a much more severe test was only a few years ahead. The dollar started to appreciate against practically all currencies after mid-1995 (the aftermath of the Tequila crisis) and strong capital inflows to Argentina were restored, facilitating high growth rates. The Asian crisis of 1997 was hardly felt by Argentina, but the Russian crisis of August 1998, followed shortly afterwards by the currency devaluation in Brazil (Argentina's main trade partner), led the country into a protracted recession. The country's inability to restore growth and the absence of fundamental changes in macroeconomic policies gradually

convinced international investors that the risk of default was sufficiently high to merit a significant reduction in exposure to Argentina. Increasing unemployment, generated by a lack of competitiveness, increased the probability of a new consensus towards a change in the monetary and exchange regime. At the same time, the fact that 93% of the government's public debt was denominated in foreign currency (while all of its income was peso denominated) and that 70% of bank loans were dollar denominated and a large fraction of that was granted to non-tradable sectors (including the public sector) implied that a devaluation would probably be accompanied by a government default and a severe banking crisis. As developed below, in those crisis episodes, which were indeed not very similar in nature, the behaviour of foreign banks was markedly different.

2. The banking system

During the later part of the Convertibility period in Argentina, and especially after the Tequila crisis, there was an effort to encourage foreign bank participation in the banking system. The view was that the capital, expertise and prestige of these foreign banks would help make the local financial system more stable. In the second half of the 1990's, British, Canadian, French, Mexican, and Spanish multinational banks purchased local banks. The fraction of banks owned by foreign capital rose substantially (see Graph 2), reaching 44% of total banks and 48% of deposits by December 2002. These figures understate the importance of this foreign incursion in retail banking since many of the local banks purchased by foreigners were among the largest. Nonetheless, after the devaluation of January 2002, a number of the newer foreign entries into the Argentine banking market decided to exit.

There is fairly wide agreement that the presence of foreign banks improves the transactions and payments technology, financial services, and banking efficiency. However, there are worries that foreign banks "cherry pick" the best firms, leaving the domestic banks with weakened loan portfolios that are concentrated in the non-tradable goods sector. In particular, it has been suggested that foreign banks concentrate on larger firms and leave the small and medium enterprises to the domestic banks.

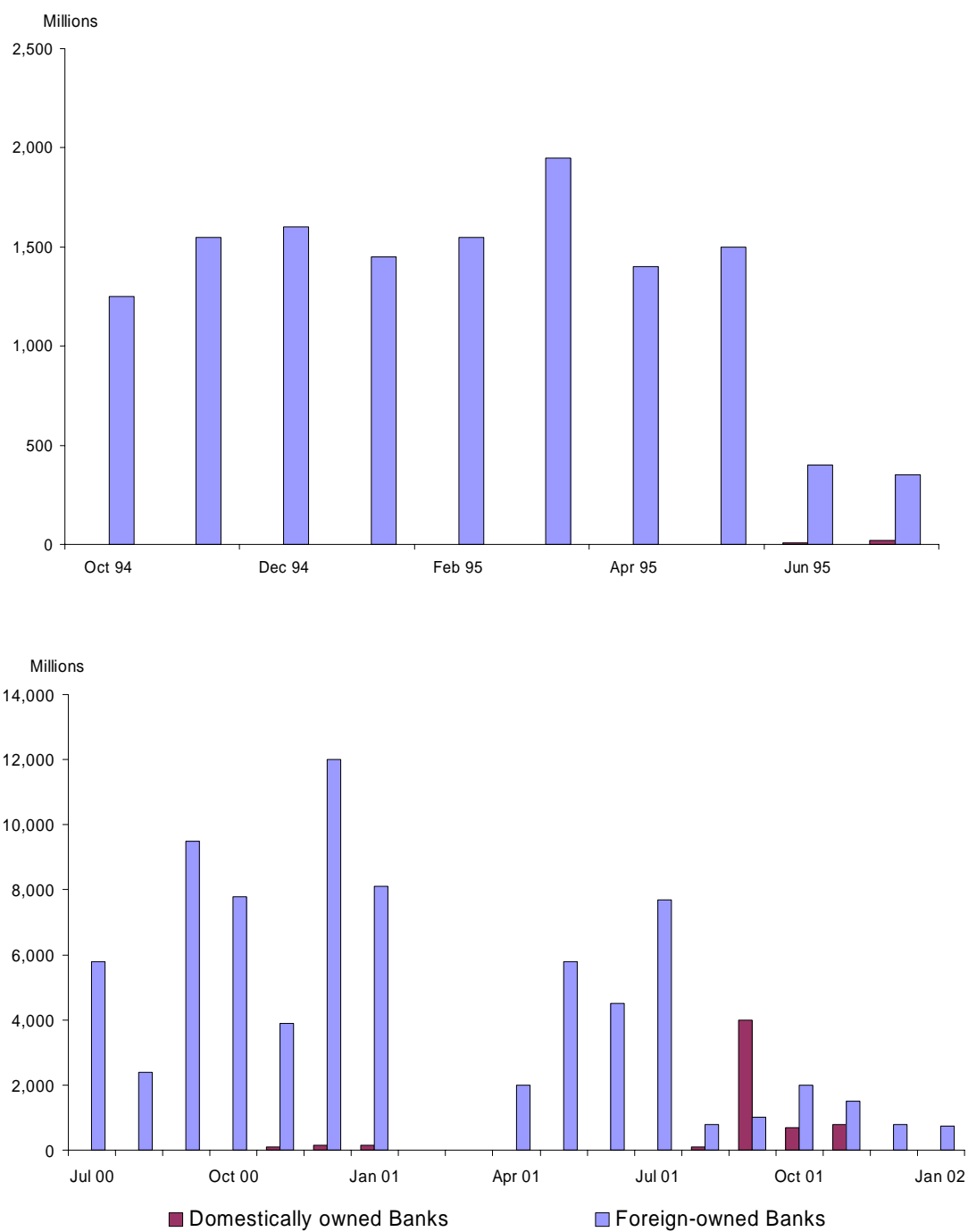
One argument that has been used in favour of foreign owned banks is that the head office will act as a lender of last resort for its branch when there is a systemic liquidity banking crisis. However, a comparison of the short-run international capital flows of foreign and domestic banks in Argentina during the Tequila crisis and the most recent crises at the end of 2001 show important differences in head office responses. This can be seen by comparing total short-term foreign credit lines of foreign and domestic owned banks (see Graph 3). During the Tequila crisis, head offices transferred substantial (for this period) amounts of funds to their Argentine branches. For the first five months of 1995, during which most of the deposit withdrawals occurred, the transfers (which include foreign trade financing) totalled 7,802 million pesos.

During the bank run leading up to the freezing of deposits in December 2001, the foreign banks took a different attitude. Although they had provided substantial credit lines to their branches in 2000, they began cutting them in 2001. By the end of the year these credit lines were fairly small, almost as if these banks had abandoned their branch offices. It could be argued that this behaviour was to be expected if the crisis under way was interpreted as much more than a systemic liquidity crisis. The bottom line was that the public did not receive the extra protection they expected from foreign banks.

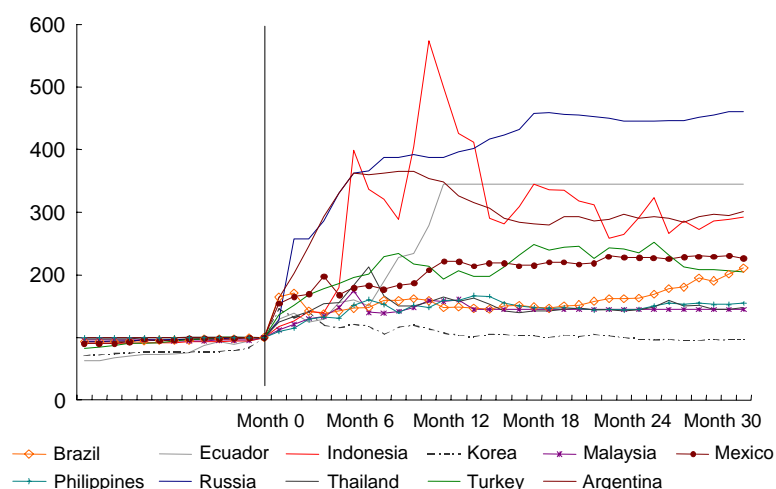
3. Sudden stops of capital inflows

The increase in portfolio financing to emerging market economies in recent decades has increased vulnerability to sudden reversals of capital flows. There have been many instances of sudden stops in capital inflows precipitating a financial and/or banking crisis that, in the majority of cases, has led to a reduction in real output. Except for Korea, financial crises since 1990 have involved a nominal and real exchange rate depreciation (see Graphs 4 and 5). About half of the crises were followed by inflation of between 40% and 200% over two years. All but Brazil saw at least some real output decline shortly after the crisis, although for five out of nine countries, real output was above its starting level two years after the crisis.

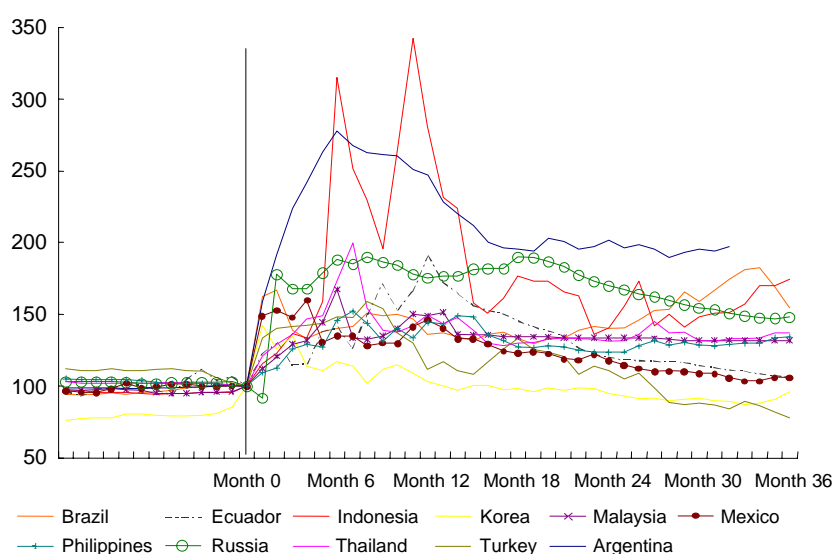
Graph 3
Foreign credit lines to banks in Argentina at times of crisis



Graph 4
Nominal exchange rate



Graph 5
Real exchange rate



The real recovery has usually required a substantial restructuring of the debts of both the financial and corporate sectors, and the speed of the recovery has, in part, depended on the ability of the country to restructure these private debts. Several countries formed specific government agencies or courts which adjudicated debt restructuring. Many of these used newly issued government bonds as a form of compensation or for recapitalising banks (in a few countries, these bonds were exchanged for equity participation).

In Argentina, the sudden stop in the refinancing of maturing government debt accelerated a run on the banking system that had started around March 2001 and ultimately resulted in the suspension of convertibility of deposits to cash (the *corralito*), the default on most government debt, severe depreciation of the currency, and the compulsory conversion of the currency denomination (*pesification*) of dollar bank deposits (at 1.4 pesos per dollar) and debts (at one to one). Output in the first quarter of 2002 was 16% below that of the previous year and 28% below the peak of 1998, deposits fell more than 40% in real terms and credit plummeted from 16% to 8% of GDP. The BCRA

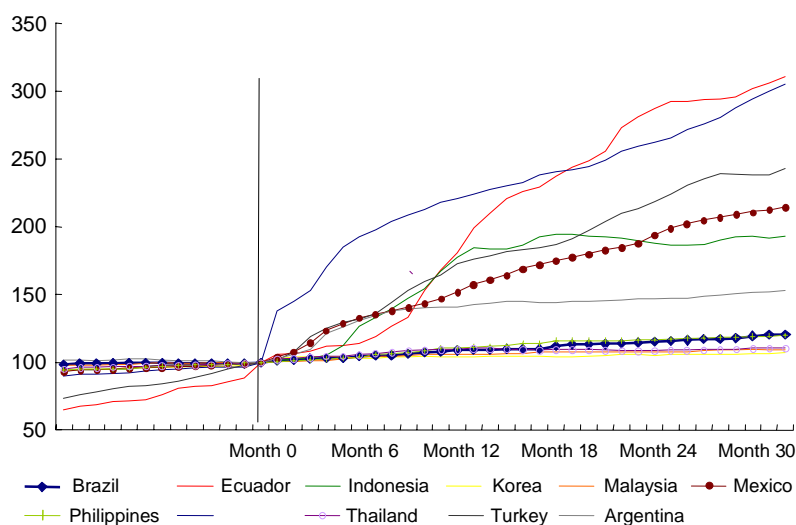
initially tried to defend a moderate 40% increase in the peso/dollar rate but was unable to do so. The subsequent depreciation was considerably greater, with significant overshooting (Graph 4). After a few months of adverse expectations, the introduction of substantial foreign currency and capital controls plus severe monetary stringency was able to reverse expectations and a gradual appreciation of the peso followed. The process of monetary control was tightened when the BCRA began issuing its own short-term (one-week, initially) zero coupon bonds (LEBACs) in order to mop up excess liquidity. The LEBAC market later developed into a principal instrument of monetary control and the LEBAC interest rate has become a reference interest rate.

Twenty months after the crisis, the interest rate on one-month LEBACs was under 1% and that on the one-year bond at 12%. The volatility of the dollar/peso exchange rate was markedly reduced, and deposits in the banking system were growing slowly. Most of the restrictions on bank deposits have been lifted, and the banks are again regularly reporting their condition to the Central Bank. The real exchange rate remains very competitive in real terms compared to most other countries who have experienced crises (see Graph 5) and the accumulated change in the price level is closer to the countries with moderate crises than to those with more severe crises (see Graph 6). The path of output since the default has been very similar to the average of other crisis countries, except that the initial decline in output was deeper.

With respect to the recovery of the financial system, even though some shock strategies proved to be useful for solving financial crises in many emerging markets, they were neither necessary nor affordable for solving Argentina's recent crises. The explanation lies in the nature of the crises, and the role of International Financial Institutions (IFIs).

Graph 6

CPI



With respect to the first item, Argentina's crisis was not preceded by a credit boom. On the contrary, it was the corollary of a deep recession that started in 1998 and reflected a downsizing of the financial system, with a reduction of 12% in the number of bank branches between 1998 and 2002. With respect to official money, IFIs were net recipients of funds. Argentina has made net payments of more than \$8 billion to IFIs, while Mexico for instance received \$50 billion of foreign assistance to deal with its financial crisis in 1995 (see Table 1).

Table 1
Recent crises

Country	Crisis date	Real change in deposits % ¹	Change in real NW % ²	Fiscal cost %	Net IMF disbursements (million US\$)
Mexico	1994-95	-15	-64	19.3	10.67
Venezuela	1994-95	-43	-6	15.0	-0.66
South Korea	1997-2000	-6	15	31.2	6.07
Indonesia	1997-2000	13	-183	56.8	10.35
Thailand	1997-2000	-2	58	43.8	3.21
Ecuador	1998-2001	-24	-59	21.7	0.30
Turkey	2000-02	-27	97	30.5	13.42
Average		-19	-20	31	6.19
Argentina	2002-03	-41.8	-37	11.4	-16.00 ³

¹ From the start of the crisis to the trough in deposits. ² Net worth, taking into account a period of two years after the crisis.

³ As of 31 July 2004.

Sources: BCRA from IFS data; Fiscal cost: "Managing Systemic Banking Crises" (IMF, 2003), except for Argentina.

Within this context of scarcity of resources and instruments, the Central Bank's strategy for the stabilisation of the financial system was based on two pillars: (1) providing institutions with time to absorb the losses caused by the crises and rebuild their capital base internally, and (2) changing regulations and prudential rules so that banks can expand their business, aiming for a financial system that is not only sound but flexible and profitable.

After several years of recession and profound multiple crises, the Argentine economy is well into the expansionary phase of the business cycle. At the time of writing, a number of problems remain: in particular, the central government has yet to come to an agreement with its foreign creditors, bank lending has been very slow to pick up, and the sharp relative price changes brought about by the devaluation have significantly reduced real incomes. Nevertheless, the economy is now growing briskly and there seems to be a recent broadening of the growth base, with investment expanding fast, albeit from extremely low levels. Capacity utilisation has been growing rapidly in manufacturing but is still very low in several service sectors. The change in relative prices has had a positive impact on the labour market. Although aggregate unemployment remains high, employment has been growing significantly for the first time in years. Tax collection, which had fallen sharply with the crisis, is rising steadily and the government is running a sizable and increasing primary surplus.

In the last 13 years, sudden stops in international capital flows have been very costly for countries in both Latin America, Asia, and eastern Europe. While some place all the blame for the sudden stops on international markets, every country that experienced from this event suffered weaknesses in either its banking system, its macroeconomic policy, or both. Strong prudential regulations, designed for the type of problems a developing country's financial system can encounter, along with sound macroeconomic policies are necessary conditions for a country to escape sudden stops. However, this might not be enough. Countries which are completely open to international capital, especially portfolio flows, seem to be particularly vulnerable. International investors seem to display, at least partially, herding behaviour in their willingness to take on risk. Changes in investor risk aversion can change international capital flows for even quite sound countries. Historically, those countries that imposed restrictions on international capital flows, such as Chile and Taiwan, seem to have been less affected by their experience with sudden stops. Some mild form of restrictions on portfolio capital flows may well be part of prudent financial policy.

Brazil's stress test of inflation targeting

Afonso S Bevilaqua¹ and Eduardo Loyo²

Introduction and background

Like many other emerging market economies (EMEs), Brazil has suffered a series of major external financing shocks since the mid-1990s. Up to 1998, those shocks were resisted by a crawling peg for the exchange rate. Starting in January 1999, the exchange rate was allowed to float, and external shocks resulted in three big waves of depreciation: in 1999 itself, in the wake of the LTCM and Russian crises, then to a lesser extent in 2001, due to a variety of factors both domestic and external, and again quite severely in the second half of 2002, in the run-up to the presidential elections in Brazil (Graph 1).

Unlike in other EMEs, notably in Asia and Argentina, such sudden waves of exchange rate depreciation did not result in generalised and severe financial distress for domestic households, corporations or financial institutions. Domestic private agents in Brazil were much less exposed to currency risk, reflecting both relatively limited currency mismatches in their balance sheets and the ample provision of foreign exchange hedging instruments by the government. The provision of hedging instruments in the form of dollar-linked public debt and swaps was originally intended to allay speculative pressure against the Brazilian real and contain depreciation. However, it was arguably more successful in alleviating the credit crunch that might have ensued otherwise during depreciation episodes.

As in any debtor economy stigmatised by the so-called “original sin”, a relatively mild impact on the private sector meant that exchange rate depreciation hit government finances pretty hard - if foreigners are not willing to bear the exchange rate risk in the first place and domestic private agents are to be spared, there is no one left but the domestic treasury to absorb the losses. Government debt as a proportion of GDP had already increased significantly during the crawling peg period (Graph 2), reflecting the combined effect of a lax fiscal stance during most of those years (Graph 3) and the high interest rates often required to defend the peg (Graph 4). The subsequent waves of depreciation contributed to further increases in the debt/GDP ratio. Such deterioration prompted decisive action regarding the primary budget in order to return public debt to a sustainable path. The need for fiscal adjustment was accentuated by the greater inflationary pressure stemming from depreciation, which in turn called for tight monetary policy and increased the debt service burden.

Indeed, apart from their fiscal impact, sudden stops had their most visible impact on inflation. It was likewise in the effort to keep inflation under control that sudden stop episodes elicited the most instructive policy response. Here we shall attempt to lay down the basic facts about that experience, which we regard as a veritable stress test successfully passed by inflation targeting (IT).

1999: Exit strategy

During the latter part of the crawling peg period, the inflationary impact of a sudden depreciation was a hot topic of policy discussion in Brazil. It was feared that lifting the exchange rate anchor might cause the economy to relapse into its historical pattern of chronically high or steadily accelerating inflation.

Soon after the peg was abandoned in early 1999, the Brazilian authorities announced that they would adopt an IT framework for the conduct of monetary policy, effective from mid-year, coupled with a

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floating exchange rate regime. It was of course not the first time IT had been adopted as a post hoc exit strategy for a country forcibly sent off an exchange rate peg.

Understandably, the announcement was met with a certain degree of scepticism. A great deal of groundwork would be needed to put a system like that together, in terms of both institution building and econometric modelling. Besides, explicitly announced “targets” for inflation had long been discredited in Brazil (except perhaps under the discipline of an intermediate target for the exchange rate).

There was another serious hurdle to overcome: the ink was still fresh on Brazil’s ongoing IMF programme, under which the country was tied to conventional performance criteria including ceilings on net domestic assets (NDA). It was felt that emphasising a quantitative intermediate target would be incongruous with the direct focus on inflation characteristic of IT. The Fund was eventually persuaded to phase out the NDA performance criterion in favour of a formal consultation mechanism based on a quarterly target band for inflation. This was a groundbreaking development as Brazil was the first country with which the IMF agreed to tailor monetary policy conditionality to IT.

All prior misgivings notwithstanding, IT actually made a rather auspicious debut in Brazil. The exchange rate depreciated considerably in 1999: by 79% at the overshooting peak in March, and by 48% at year-end, relative to the last day of the crawling peg.³ Yet consumer price inflation was a mere 8.9% in 1999 - nothing like the high double digit figures that had been forecast, and well within the 6-10% target range established for the year. Disinflation kept progressing and the 6% central target for 2000 was squarely hit, despite the fact that oil prices had by then increased significantly for two years in a row.

Several factors contributed to the surprisingly low degree of pass-through and thus to the initial success of Brazil’s experiment with IT. A new team assembled at the central bank succeeded in restoring the country’s badly damaged monetary credibility and quickly put in place an IT regime complete with all canonical bells and whistles (the first *Inflation Report* was published in June 1999). Widespread anticipation of a large contraction in economic activity, perhaps comparable to the ones seen in Asia, although later proven to be misplaced in the case of Brazil, also had a dampening effect on the upward adjustment of domestic prices.⁴ Finally, the currency had been clearly overvalued, leaving greater room for the nominal devaluation to be seen as an equilibrium realignment of the real exchange rate.

2001: Target miss

Circumstances would be somewhat different in the next wave of exchange rate depreciation, giving even greater prominence to inflation amid the adverse consequences of the sudden stop.

The external environment had been slowly deteriorating since the second half of 2000, with mounting concerns regarding worldwide economic growth and dimming hope of an orderly resolution of the serious predicament into which Argentina had fallen. Accordingly, the real had been sliding in a gradual fashion.

Starting in the second quarter of 2001, energy shortages and rationing not only had an immediate impact on the economy but also adversely affected its longer-term prospects, thus hurting the country’s perceived creditworthiness. There was also some degree of unrest in the domestic political scene, which the energy crisis further stirred. Those factors accelerated the depreciation of the real. Then, to make matters worse, came the shock of 11 September. Relative to 2 January, the exchange rate had depreciated by nearly 44% at its peak in September, and the average depreciation for the year was nearly 21%.

³ Given that the slow crawl barely survived a couple of weeks into the year, the depreciation rates would be just slightly higher if computed with respect to the first day of the year. The rates of nominal depreciation mentioned throughout the paper refer to the rates of increase of the price of 1 US dollar in Brazilian reais.

⁴ Early consensus forecasts had suggested that GDP might contract by as much as 4%. Growth forecasts had already been revised to –1% by June, then to 0% by September, and the year ended with positive 0.8% growth.

It was true that this time around there was the considerable benefit of an up and running IT framework, with a positive if short record under its belt. However, the economy was coming from robust 4.4% growth in 2000, which continued unabated into the first quarter of 2001, and inflation had already shown incipient signs of picking up even before the shocks hit in earnest, partly as a consequence of a bad domestic harvest. The energy shortage would curtail productive capacity when utilisation rates had already increased, although it was also expected to have a dampening effect of unknown magnitude on aggregate demand through consumer and investor confidence.

Furthermore, the real exchange rate was already much closer to equilibrium, although the effect of the realignment of 1999 on the current account had been somewhat disappointing. Except for some limited room for further equilibrium realignment, there seemed to be only two avenues open: either the nominal devaluation would be reversed or, if it proved lasting, inflation ought to corrode much of the observed real depreciation.

By the end of the year, much of the depreciation was indeed reversed (it was down to about 20%), but the inflation target had already been irremediably compromised. Inflation was 7.7% in 2001, almost twice the central target of 4% and outside the $\pm 2\%$ tolerance margin. The central bank estimated that inflation would have been 4.8% in the absence of exchange rate depreciation, and even closer to target if it had not been for an 18% increase in electricity rates.

However, even allowing for some inertia, it was believed that considerable disinflation would be achieved before the end of the following year, bringing inflation back close to the target, which had been set at 3.5% for 2002. The situation seemed comfortable enough for the monetary policy committee (Copom) to start a cautious process of monetary easing in February 2002. The Selic rate was cut from 19% to 18.75% that month, then to 18.5% in March, and then again to a yearly low of 18% in July. At the August Copom meeting a downward bias was announced which was ultimately not exercised and was actually withdrawn in September. Before this episode ended, a new one was about to begin.

2002: Sudden stop

The June 2002 *Inflation Report* carried a warning: its projections implicitly assumed that the political transition later in the year would not cause “exaggerated and/or prolonged turmoil” in the economy and that economic policy in 2003 would remain “committed to the inflation targets”. Markets would soon call these fateful assumptions into question, leading to a quite severe capital account crisis and causing a sharp depreciation of the real.

Although it happened at a time of increased worldwide risk aversion, attributable to corporate financial reporting scandals, domestic politics played a visible role as the trigger of the confidence crisis. As capital flows to EMEs dried up, the movement was magnified in the case of Brazil, as indicated by the widening gap between its country risk spreads and the EME average (Graph 5). The country suffered a USD 28 billion reversal in capital flows, and even the normally resilient trade credit lines were cut by 28%.

The domestic component of the confidence crisis involved several different considerations. Investors feared that the business environment might actually become unfriendly under a new government, or at least be perceived as such, which would suffice to depress capital flows to Brazil and sanction a speculative move against the real. There were serious concerns about the willingness of the new government to generate primary surpluses commensurate with the burden of Brazil's public debt, which naturally led to rumours of impending debt repudiation.

Scepticism regarding monetary policy was even greater. Not only were conditions prone to fiscal dominance, but the country's legitimate anxiety to grow faster had also been adopted as the order of the day by all parties in the presidential campaign. That would be hard to square, in the short run, with keeping inflation in check or undergoing the likely sacrifice of disinflation.

The exchange rate had started the year at BRL 2.30 to the dollar and fluctuated mostly within the BRL 2.30-2.45 range until early May (corresponding to a maximum depreciation of 7%). Henceforth depreciation progressively gained momentum: with respect to the beginning of the year, it was at 17% when the Copom met in June, at 25% when it met in July, up to 34% by the August meeting, then to 45% by the date of the September meeting, and it finally peaked at 71% sometime in October

(Graph 1) - threatening to breach, amid much trepidation in financial and political circles, the ominous BRL 4/USD barrier. By 31 December, despite an already consistent trend reversal, the real had still posted a 53% depreciation over the year. The yearly *average* of the exchange rate showed a depreciation of 44%, the same figure as the *peak* of depreciation observed in 2001.

Depreciation in 2002 was thus comparable in size to that of 1999, and considerably more intense than in 2001. Since it took place *on top of* the two preceding waves of realignment, which had already made the real exchange rate much more depreciated, it was even more likely to generate inflationary pressure, unless the nominal exchange rate could be expected to slip back in early 2003. Unlike the 1999 episode, the events of 2002 and 2001 shared the common feature of depreciation concentrated in the second semester, with greater likelihood of an inflationary spillover into the following calendar year.

The overall size of the inflationary impact thus remained highly dependent on 2003 monetary policy - both for exchange rate reversal and for demand management - when scepticism about its resolve was at the very root of the problem. It is only natural that inflation expectations for 2003 should have deteriorated sharply towards the end of 2002. According to a daily survey of professional forecasters regularly conducted by the central bank, median forecasts had been stable at 4% for the whole first semester, had climbed to 5% by early September, to 6% by mid-October, to 8% by the end of that same month, to 9% a week later, and had closed the year at 11% (Graph 6).

This deterioration, in turn, fed back into current inflation rates, because forward-looking price setters are understood to post higher prices in anticipation of higher future inflation. Not only were point forecasts of inflation revised upwards, but uncertainty about inflation also became considerably greater.⁵ Greater inflation uncertainty translated into greater uncertainty regarding ex post real interest rates, to which an increase in perceived default risk also contributed. More uncertain real interest rates may represent less of an inducement to postpone expenditures, which detracts from the contractionary effect of any given increase in the ex ante real interest rate. There was indeed statistical evidence of a rush to consumer durables towards the end of the year.

Inflation in the fourth quarter of 2002 ran at an annualised rate of 29%, up from 11% in the third quarter, and 6% in the first two quarters of the year (Graph 7). The year ended with 12.5% consumer price inflation. The central bank estimated that inflation would have been 6.7% had the exchange rate remained constant throughout the year, and 5.1% discounting also the effect of the deteriorating expectations. If one also discounts the first-round effect of a number of identified supply shocks, inflation would have been 4.3%, a little higher than the central target of 3.5% but well within the official tolerance margin. In any event, the exchange rate was the main culprit in the target miss; inasmuch as it can be partly blamed for the deterioration of inflation forecasts, its importance exceeds the already dominating direct effect just reported.

This time the target miss begged the question of what to expect from monetary policy in 2003, if commitment to inflation targeting were indeed to be preserved. In June 2002, the government had already felt the need to revise upwards the target for 2003, from 3.25% to 4%, and to widen the tolerance margin from $\pm 2\%$ to $\pm 2.5\%$. Even those numbers sounded utterly unrealistic given the developments in the latter part of the year.

The central bank had by then proposed to guide 2003 monetary policy by an “adjusted target”. The adjustment involved the *partial* accommodation of the inflation inertia inherited from the past, and the accommodation of first-round effects of a certain class of identifiable supply shocks (which did *not* include exchange rate depreciation).⁶ The new methodology served to indicate explicitly the trajectory through which inflation should be expected to return to target over the two following years, which was, however, made contingent on certain types of supply shocks that might hit in the meantime.⁷

⁵ A crude indicator of inflation uncertainty is the dispersion across forecasts in the survey. The standard deviation of forecasts was in the neighbourhood of 0.5 during most of the first semester; it had increased to 1.2 by mid-September, reaching a peak of 3.1 by mid-October.

⁶ This procedure is described in detail in Chapter 6 of the June 2002 *Inflation Report*. Further discussion can be found in A Fraga, I Goldfajn and A Minella, “Inflation targeting in emerging market economies”, *NBER Macroeconomics Annual 2003*.

⁷ Note that fully specified state-contingent trajectories for reverting to the medium-term targets for inflation were one of the improvements on the typical implementation of IT recently urged by Michael Woodford, in *Inflation targeting and optimal*

The supply shock contingency aroused some protest among specialists, as targets for any year could be adjusted in the course of that year. However, through automatic (that is, *non-discretionary*) adjustment of the targets for headline inflation it accommodated the first-round effects of certain supply shocks, thus producing the same results one might obtain by targeting a measure of core inflation. The initial calculation at the end of 2002 resulted in adjusted targets of 8.5% and 5.5%, respectively, for 2003 and 2004. These numbers reflected the premise that monetary policy should only fight one third of the inflation inertia in the first year, accommodating the remaining two thirds. The degree of accommodation was the only choice parameter involved in the whole calculation of the adjusted targets. It was selected taking into account explicitly the central bank's econometric estimates of the output sacrifice required to achieve the resulting adjusted targets. The candid admission of output stabilisation objectives, along with the notion that first-round effects of supply shocks ought to be accommodated, should be enough to disabuse those who insist on depicting IT practitioners as "inflation nutters".

2003: Disinflation

Interest rates had already been raised in the last months of 2002, as inflation and inflation expectations quickly deteriorated. On 14 October, the Copom convened for an extraordinary meeting, something that had never happened since IT was first implemented. The sense of urgency was heightened by the fact that the Committee could not wait for a regular meeting already scheduled to take place a week later. It decided to raise the Selic rate by 300 basis points, to 21%. In November and December it made two more hikes, of 100 and 300 basis points respectively, bringing the Selic rate to 25% at the end of the year.

Rates were increased further early in 2003 - already into the new government's term - first by 50 basis points in January and then by 100 basis points in February, thus reaching 26.5%. In February the interest rate hike was complemented by an increase in the reserve requirements of commercial banks. In March the rate was kept unchanged but an upward bias was announced, which, like the August 2002 downward bias, would not be exercised and would be removed a month later.

Even before it took office on 1 January, the new government had spared no effort to assert a market-friendly and fiscally austere policy stance. It also confirmed its commitment to IT aimed at the adjusted targets proposed by the central bank. Although the foreign exchange market had quieted down and the real had appreciated somewhat after the elections, the 2002 sudden stop left a challenging legacy for the new year: a legacy of inflation running very high - at 22% per year on average in the first quarter - and inflation expectations that kept deteriorating - from 11% in early January to 12.3% in late March, for calendar year 2003.

The task at hand was then best characterised as a major disinflation, not as the routine stabilisation of garden-variety inflationary shocks. Unlike in the previous episodes described earlier, inflation expectations had resolutely shifted upwards. There was also evidence that the degree of inflation inertia had increased in the economy. To complicate matters further, 12-month accumulated inflation, an important indicator in the presence of backward-looking indexation (either contractual or by rule-of-thumb price setters), would remain high for most of 2003, to fall precipitously only in the last quarter when the very high inflation of the last months of 2002 would finally drop out of the computation.

Unfortunately, there was limited public understanding of the mechanics of disinflation under an IT floating exchange rate regime, with a nominal interest rate as the monetary policy instrument. There was little international experience to draw on, since most IT countries that had undergone disinflations of comparable magnitude had done so with the aid of exchange rate management or targets for monetary aggregates. One soon realises that, compared to IT with a nominal interest rate instrument, the beauty of exchange rate or monetary aggregate targets is the greater ease of communication with the public. Monetary policy can be represented by the exogenous setting of an instrument or

monetary policy, mimeo, Princeton University, 2003. Of course, there is no claim that the scheme of adjusted targets as implemented in Brazil in 2002 satisfied the criteria envisaged by Woodford for policy optimality.

intermediate target, supposedly leading to inflation in a one-directional causal chain of disarming simplicity, as captured by a basic quantity equation or PPP relation.⁸

A number of arguments were also circulated suggesting that particular circumstances somehow impeded or distorted the transmission mechanism of monetary policy, which was then bound for defeat against inflation. Historically low aggregate credit levels in the economy would presumably detract severely from the effectiveness of monetary policy in demand management. In turn, the inertial or cost-push nature of the ongoing inflationary process supposedly made demand management entirely ineffective in containing inflation - a great pain with no gain. Some observers went as far as suggesting that monetary policy might actually work in reverse, given Brazil's large stock of public debt. Increases in interest rates would worsen debt dynamics, increasing country risk and making the exchange rate depreciate; with the pass-through from depreciation, tight money would make inflation higher rather than lower.⁹ However, Brazil did succeed in securing disinflation through monetary tightening, with a perceptible contribution from the aggregate demand transmission channel. This indicates that Brazil did not satisfy the conditions under which such conjectures, no matter how plausible, would in fact be valid.

Inflation expectations for 2003 kept deteriorating until the date of the April meeting of the Copom, when they stood at a peak of 12.5%. Expectations for 2004 inflation remained stubbornly at 8% all that time. It was only when the Copom decided, at its April meeting, to maintain rates at 26.5% for a third month in a row, despite tremendous public outcry, that monetary resolve showed signs of paying by lowering expectations. These started subsiding for both 2003 and 2004 horizons. The Selic rate went unchanged again in the May meeting, and by the time of the June meeting expectations were down to 11.8% for 2003 and 7.4% for 2004. The Copom opted for a modest 50 basis point rate cut in June. When it met again in July expectations had fallen to 10.4% for 2003 and 6.5% for 2004, which prompted a further 150 basis point cut, bringing the Selic rate to 24.5%.

At the end of June the government adopted the 5.5% adjusted target as the official inflation target for 2004, in a public display of support for monetary policy as conducted thus far. Unlike adjusted targets, official targets are firm, not state-contingent, but a $\pm 2.5\%$ tolerance margin is set around them. It was felt that the dust had settled sufficiently to warrant a return to firm targets, which are more easily understood by the general public. However, the originally planned trajectory of convergence to the long-run targets would be maintained. In that spirit, an official target of 4.5% for 2005 was also announced, with $\pm 2.5\%$ tolerance margins.

In June and July, helped by the appreciation of the real, monthly inflation rates became very low - indeed the consumer price index (IPCA) registered deflation in June. The level of activity had also reached a trough in the second quarter. Public pressure naturally mounted for drastic monetary easing, as inflationary pressures seemed to have been completely quashed. The very low inflation rates in these months were interpreted by the central bank as a non-recurring event, not representative of the actual deceleration of the underlying trend in inflation. Good news with more staying power was instead the estimated reduction of the coefficient of inflation inertia, which boded well for further progress with disinflation.

⁸ By comparison, the modern theory of monetary policy with a nominal interest rate instrument is quite obscure, riddled as it is with notions inaccessible to anyone except macroeconomists with advanced training. Take, for instance, the need for interest rates to be set regularly with a strong enough reaction to inflation to constitute a proper nominal anchor - the so-called "Taylor principle". With the policy instrument setting turned endogenous (as a function of inflation, itself an endogenous variable), there is the question of how to build the choice of disinflation trajectory into a dynamic model correctly treating the formation of expectations, an ingredient deemed crucial in the context of disinflation. The easiest answer is to depict policymakers as choosing the trajectory of an "implicit target" for inflation, with the prescription that interest rates shall be raised more the greater the departure of inflation from that implicit target, according to a predefined reaction coefficient. Disinflation results from implementing such a reaction function while making the implicit target approach the long-run inflation target over time. However, if there is inflation inertia (an empirically reasonable assumption), inflation will not be made to fall as fast as the implicit target. One ought, therefore, to distinguish between the implicit target trajectory rationalising the setting of interest rates and the intended disinflation path. Otherwise, policy can be taken as promising something it simply cannot deliver. Alternatively, if the public mistakes the intended trajectory of disinflation for the "implicit target" monetary policy will be regarded as overly restrictive if inflation does fall according to plan. The reader who finds all this terribly convoluted is not alone. The point is that, in the context of disinflation, the technical state of the art is a communications nightmare!

⁹ This point is best articulated by Olivier Blanchard, *Fiscal dominance and inflation targeting. Lessons from Brazil*, mimeo, MIT, 2003.

Central bank officials signalled in a series of statements and in the Copom minutes that interest rate cuts would be forthcoming as long as disinflation progressed, but that the reduction would be gradual, not drastic. Efforts were made to spread the familiar message that monetary policy affects the economy through shifts in the entire term structure of interest rates, which in turn depends not only on the current overnight rate but also on where overnight rates are expected to be in the future. In a process of disinflation, the current Selic rate was, by itself, a particularly poor measure of monetary policy stance, as market rates for longer maturities already incorporated expected rate cuts. Too steep a (negatively sloped) yield curve could undermine the intended contractionary stance, jeopardise the disinflation path and risk precluding future cuts as fast as those built into the curve. Therefore, some signalling about the future trajectory of interest rates seemed valuable in order to avoid excess volatility in the term structure.

Market forecasts of inflation stood at 9.7% for 2003 and 6.2% for 2004 on the date of the August 2003 Copom meeting. Forecasters started seriously contemplating the possibility of 2003 inflation ending up very close to the 8.5% adjusted target, a prospect greeted with derision earlier in the year. As some were quick to point out, inflation was headed towards a figure well within a putative $\pm 2.5\%$ tolerance margin around the adjusted target (although, as already mentioned, adjusted targets were regarded as indicative rather than as a performance criterion for the monetary authority, and as such carried no formal tolerance margins around them). At that meeting the Copom made a more significant 250 basis point cut, and then cut 200 basis points more in September, bringing the Selic rate down to 20%.

Disinflation is still a work in progress at the time of writing, but at this already advanced stage one can conclude that it has entailed relatively moderate costs in terms of output loss. Contraction in the level of activity was sharpest in the second quarter, but consistent signs of recovery were already visible in the third. That result comes in spite of the fact that 2003 output was also negatively affected by the halting of investment plans during the turbulent political transition, the impact of which is hard to disentangle from the effects of tight monetary policy.

Conclusion

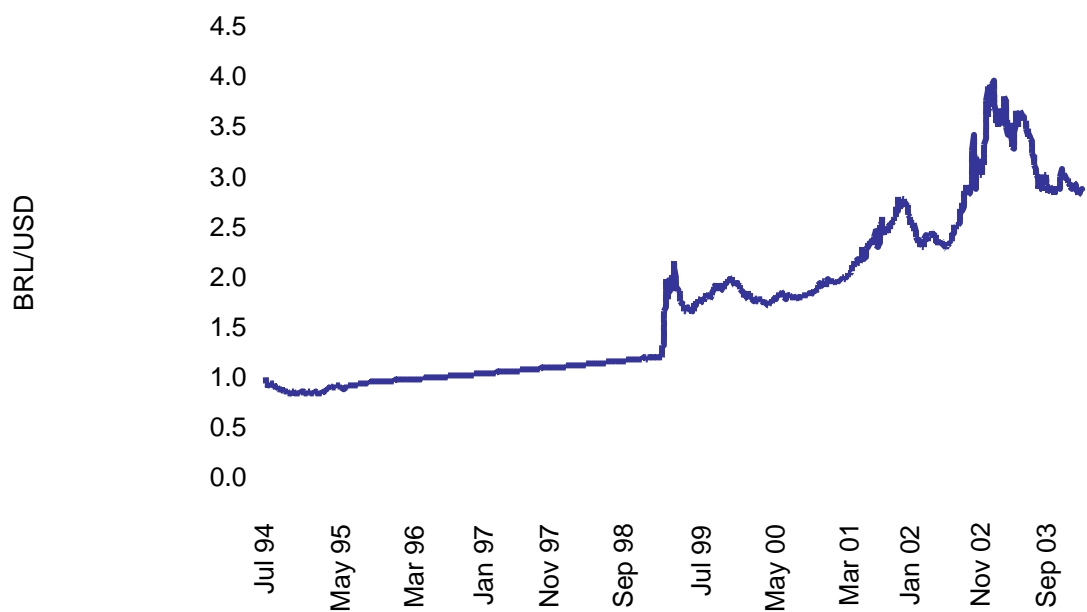
Among all EMEs adopting IT, Brazil may very well be the one displaying the largest deviations of inflation from target. Considering, however, the sizeable shocks hitting the Brazilian economy during its experience with IT, the outcome is still quite encouraging.

Between January 1999 and the third quarter of 2003, the real depreciated by 140%. It had traversed much higher overshooting peaks along the way, with up to nearly 230% depreciation, and yet inflation over that whole period was approximately 50%. Given its long prior experience of depreciation-inflation spirals, Brazil would not have been expected to emerge from a 60% *real* depreciation with 50% cumulative inflation.

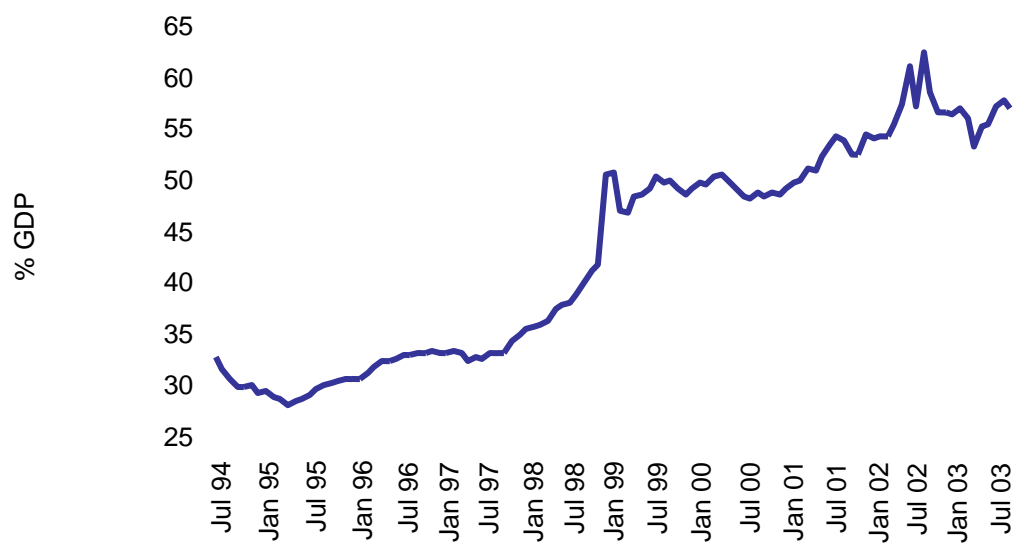
Of course, the 1999-2003 average annual GDP growth falls far short of the country's potential and aspirations for a long-run growth trajectory. However, given the uncommon intensity of economic turbulence marking the period in question, with its direct impact on output compounded by a constant need to fend off inflationary pressures, the trajectory of output was not at all unsatisfactory either in terms of average growth or in terms of the amplitude of fluctuations. In particular, the output costs of disinflation were relatively small, especially considering the degree of credibility to which a newcomer to IT, without much of a track record for monetary austerity, might dare to aspire.

Brazil's experience also bears witness to IT's resilience as an expectation coordination mechanism. The 2003 disinflation indicates that monetary resolve could be credibly reasserted even when inflation targets had been missed for three years in a row, out of a total of only five years on IT. That seems possible provided that the misses are understood to be legitimately due to force majeure, and indeed to represent a reasonable compromise between adherence to the inflation targets and the need to smooth output fluctuations, in accordance with the best practices of "flexible" IT.

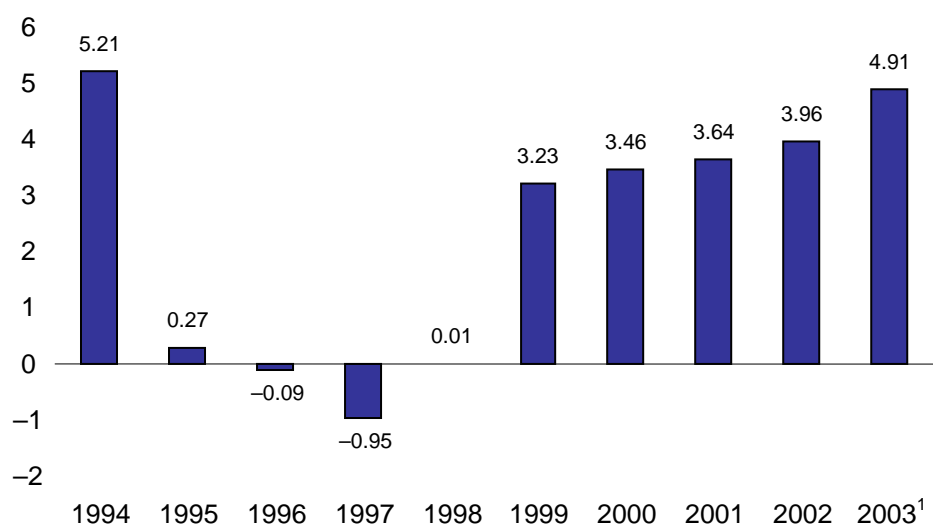
Graph 1
Nominal exchange rate



Graph 2
Debt/GDP ratio

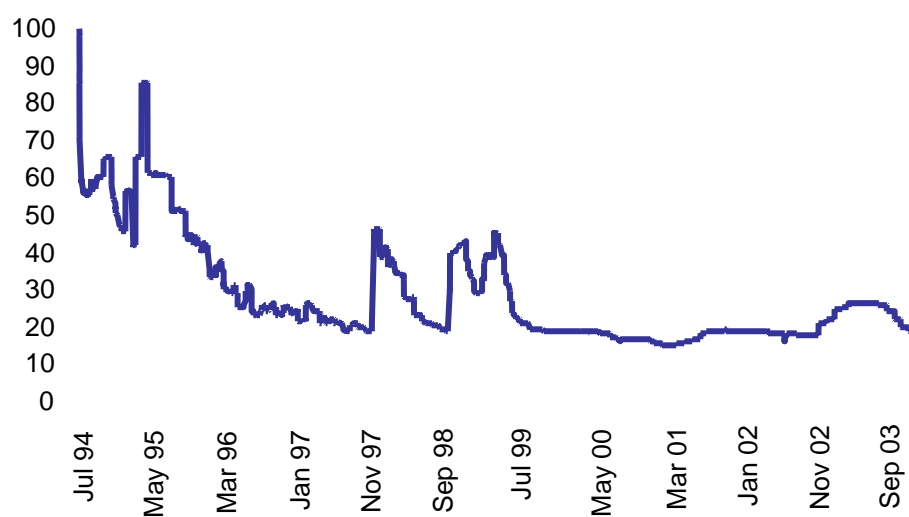


Graph 3
Primary budget surplus
 As a percentage of GDP



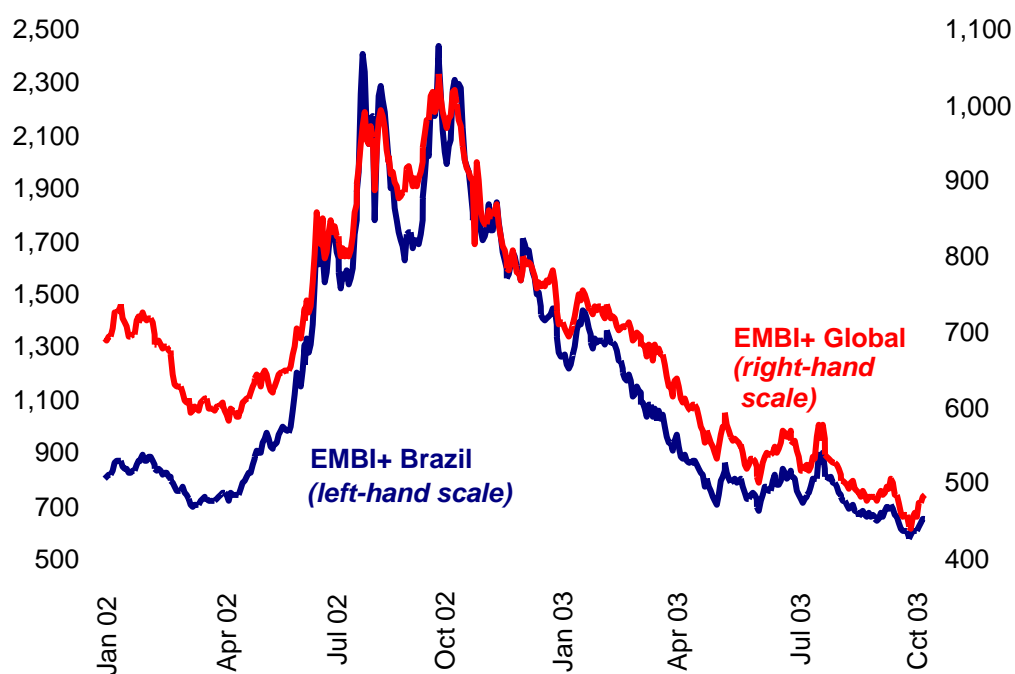
¹ January to August.

Graph 4
Selic rate
 In per cent

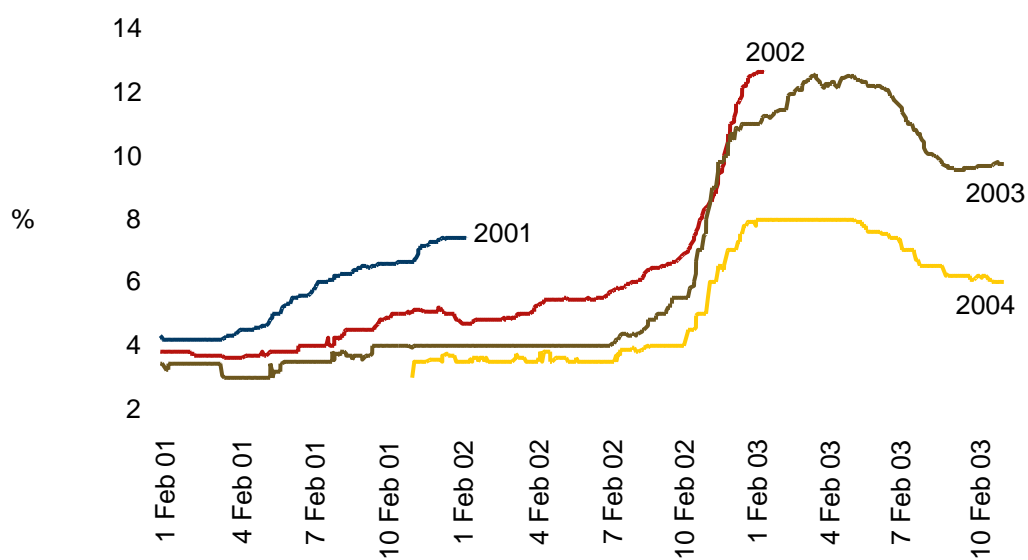


Graph 5
Country risk - Brazil
versus EME average

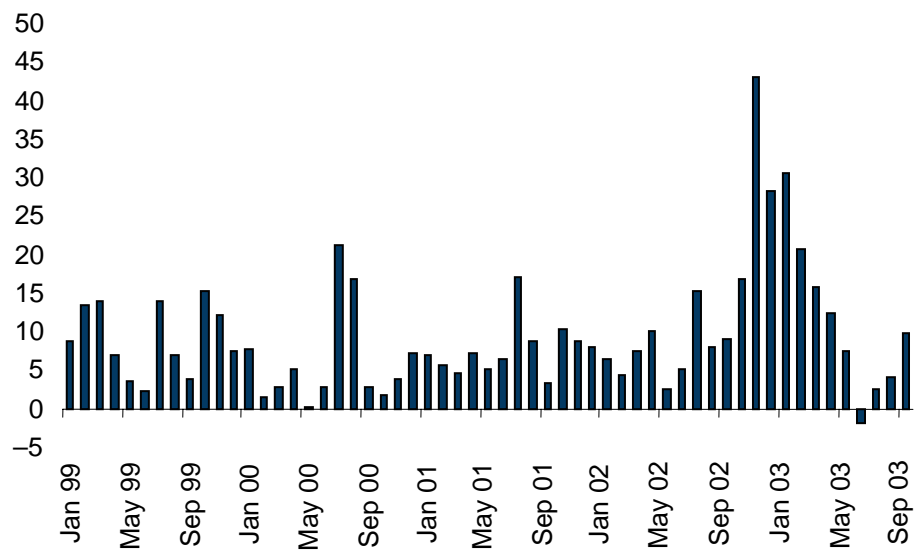
In basis points



Graph 6
Median inflation forecasts
for calendar years 2001-04



Graph 7
IPCA inflation rates
 In per cent per year



Monetary policy and financial integration: the case of Chile¹

Rodrigo Cifuentes and Jorge Desormeaux

I. Introduction

In Chile, monetary policy and financial openness have experienced important changes in the last 30 years. Starting in the mid-1970s, a first attempt to liberalise financial markets and the capital account ended in a major financial crisis in 1982, due to inadequate prudential regulation and supervision. This reflects the fact that financial integration can make a major contribution to economic development, but also entails risks. On the one hand, free mobility of capital across borders allows the financing of investment at a lower cost and thus has a positive effect on output. Capital flows also facilitate the transfer of new technologies, ease access to foreign export markets, increase competitiveness and develop domestic capital markets. They can also facilitate portfolio diversification and consumption smoothing. On the other hand, an open capital account can increase local vulnerability and exposure to external shocks, as Chile experienced in 1982. Other well-known examples of risks related to open capital accounts include those derived from overheating, asset price bubbles or excessive risk taking in the financial and corporate sectors. Since capital flows are highly volatile, the recipient country may also become more exposed to contagion and the herding behaviour of international investors.

To enjoy the advantages of financial integration, the Chilean economy completely opened the capital account in 2001. But before reaching this stage, the country built strong institutions to deal with the associated risks. Today the Chilean economy is much better prepared than in the past to deal with the challenges of financial openness. This has been thoroughly recognised by international financial markets, and demonstrated by its response to “real life” stress tests, such as the crises in other economies in the region, and the world economic slowdown of 2001-03.

The institutional cornerstones of Chile’s current macroeconomic stability include a monetary regime based on inflation targeting, a fiscal policy based on a structural budget surplus rule, and a floating exchange rate regime. Financial stability is supported by credible institutions and effective regulations, which include technical supervisory bodies devoted to specific financial and capital-market segments.

This paper describes the policy frameworks and institutions adopted in Chile to reap the benefits of financial integration at minimum risk. In addition, it provides econometric and other quantitative evidence of the extent of such integration and some of its characteristics. Section II provides a historical perspective and reviews the key elements of Chile’s macroeconomic policy framework: monetary policy based on central bank independence and inflation targeting, a floating exchange rate regime, and coordination of monetary policy with a rules-based fiscal policy. Section III explains the long-term process involved in the opening of the capital account and its relation with other policies and institutions. Section IV gives an empirical analysis of financial integration in Chile and assesses its extent and evolution over time. Section V provides concluding remarks.

¹ We are grateful to Leonardo Luna for excellent research assistance. Sections II and III draw extensively on work by a staff team at the Central Bank of Chile led by Esteban Jadresic (Central Bank of Chile (2004)).

II. Monetary policy framework and institutions

II.1 A historical perspective

Monetary policy and financial integration have experienced important changes over the course of the 20th century in Chile. Until 1931, the Chilean economy was fully integrated into the world economy, and monetary policy was subordinated to the balance of payments, as befitted the Gold Standard. After the 1930s, free trade was replaced by import substitution, capital movements were severely restricted, and access to international capital markets disappeared. Financial repression became the norm, and monetary policy was passively subordinated to fiscal policy. As a result, inflation became high and persistent, in a period when the developed world experienced very low inflation, as a by-product of the Bretton Woods arrangement.

Important reforms took place in the second half of the 1970s, as a new administration drastically reduced the fiscal deficit, liberalised capital markets, and opened the economy to foreign trade. Monetary policy was no longer subordinated to fiscal policy, but to the balance of payments, while the exchange rate followed a crawling peg. In that framework monetary policy lacked a nominal anchor. Therefore, in 1979, the Central Bank of Chile (CBCh) pegged the exchange rate to the US dollar, providing a nominal anchor for monetary policy. The fixed exchange rate regime was abandoned in June 1982 as a result of a major financial crisis which was triggered by a large shift in US monetary policy and inadequate prudential regulation and supervision at home. Subsequently (until the end of the decade), monetary policy was subordinated to the resolution of the financial crisis. In August 1984 the exchange rate was allowed to float within a narrow band, in an environment of tight capital controls. This allowed the CBCh some room to follow an active monetary policy in 1985. However, monetary policy could not operate as an effective counter-cyclical tool until the following decade, due to the significant external constraint created by the debt crisis. As a result, balance of payments considerations prevailed over other policy goals, such as inflation or output stabilisation.

In December 1989, in a landmark decision, new Central Bank legislation was enacted which established a significant degree of independence for monetary policy.

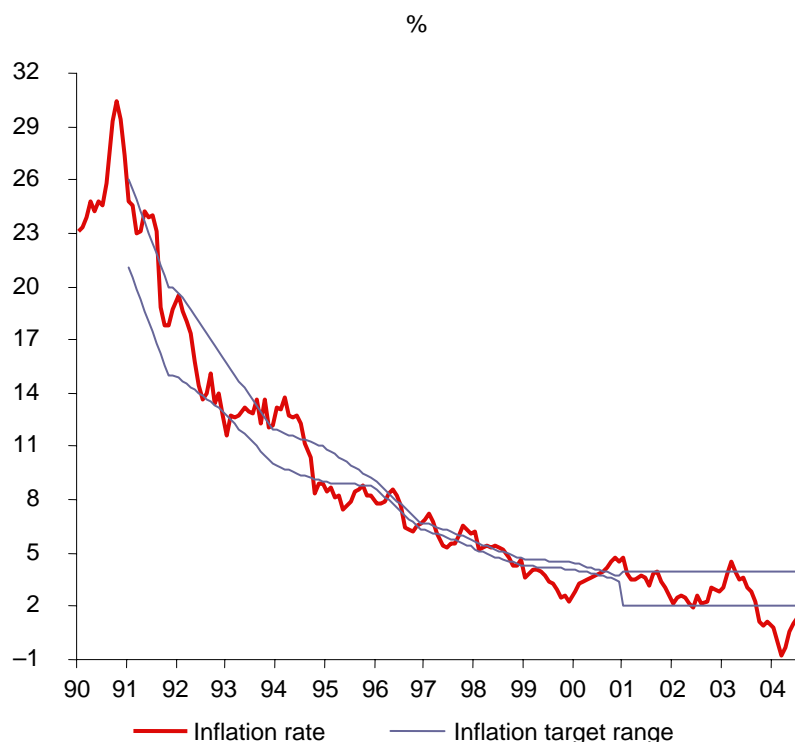
II.2 Monetary policy under inflation targeting

Of all the possible monetary regimes available at the time, the newly independent Central Bank opted in 1990 for inflation targeting (IT), becoming the second country to adopt such a framework after the Reserve Bank of New Zealand in 1989. The first annual target was established in September 1990 for the following year. Subsequently, Chile successfully reduced inflation down from a peak of 30% year-on-year in September 1990 to single digit rates in less than a decade (see Graph 1). The IT framework was fully implemented in 2000, when the CBCh formally adopted this approach to monetary policy, established procedures for regular monetary policy meetings, forecasting tools and models, and began publishing periodic inflation reports including explicit inflation forecasts. Previously, in September 1999, the CBCh had adopted a floating exchange rate regime, which strengthened its anchor and its own management of monetary policy.

Since 2001, Chile's inflation target has been defined as a 2% to 4% target range, centred around 3% annual inflation. The headline CPI is used as the inflation target measure over a 24-month policy horizon, based on an estimate of how long it takes for monetary policy changes to affect inflation. Monetary policy responds to deviations of the CBCh's inflation forecast (and the gap between actual and potential output) from the 3% inflation target over the 24-month policy horizon. While the ultimate goal is to achieve the inflation target, policy focuses on inflation forecasts. This regime is sometimes called "inflation-forecast" targeting.

The CBCh's operational target is the overnight interest rate on interbank loans. Monetary policy instruments include open-market operations (OMOs), standing facilities and legal bank reserves. OMOs are the main instrument for managing liquidity according to an operational target level determined by the Central Bank Board. They take the form of twice-weekly auctions of Central Bank securities, maturing in up to one year. Liquidity management is fine-tuned by complementary repurchase and reverse-repurchase operations. Standing facilities are credit lines that provide liquidity at higher interest rates, to discourage their use at normal times. Reserve requirements on bank deposits are not used as a monetary policy instrument and in fact have remained unchanged since 1980.

Graph 1
Inflation targets and inflation rates 1990-2005



The Central Bank believes that transparency and accountability should be central features of monetary policy and has acted accordingly. The monthly schedule of monetary policy meetings is announced in advance and a press release and minutes are published shortly after each meeting. The *Monetary Policy Report*, which is published every four months, is widely circulated by Board members and managers. The Bank's macroeconomic projections model, statistical data, and policy and research papers are published regularly on paper and also on the Bank's website. By law, the Central Bank is accountable to the Chilean Senate. After every *Report's* release, the Central Bank Governor and Board present the analyses and projections therein to the Senate.

Monetary policy can contribute to output stabilisation, as long as this is consistent with its primary objective of meeting the inflation target. This occurs when demand shocks dominate supply shocks, ie when output (or the output gap) is positively correlated with inflation. Under such circumstances the Central Bank contributes actively to stabilising both inflation and output, applying a counter-cyclical monetary policy. Since 2002 the counter-cyclical stance of monetary policy has been reinforced, as reflected by an increasingly expansionary monetary policy in response to the combination of below-target actual inflation and lower than potential actual output.

Monetary policy does not deal with volatile capital flows directly. However, when changes in their level or volatility affect other macroeconomic variables, and ultimately economic activity and inflation, then monetary policy reacts, and can have an effect on capital flows. This procedure is consistent with the Central Bank's mandate and contributes to more effective monetary policy management in Chile.

II.3 The floating exchange rate regime

As discussed above, the Central Bank complemented its inflation targeting regime with a floating exchange rate regime. This was implemented in September 1999, at the same time that the IT framework was consolidated, and when the Board of the CBCh estimated that mechanisms for dealing with external shocks had been enhanced. This topic is discussed in Section III.

Considering Chile's floating exchange rate regime and rising creditworthiness in international capital markets, the need for holding large amounts of international reserves has been reduced. On the other hand, the declining risk premium on Chile's external liabilities has also lowered the Central Bank's cost

of carrying reserves. In this context, the CBCh is implementing a programme to redeem part of its dollar-linked debt with international reserves, which is expected to reduce its current level of reserves. Nevertheless, the Central Bank will continue to maintain a significant level of international reserves for two reasons: one, because reserves contribute to reducing the country risk premium and act as a buffer against possible liquidity shocks; and two, because reserves allow monetary authorities to intervene credibly in the exchange market under exceptional circumstances.

Like most other central banks, the CBCh can conduct sterilised foreign exchange interventions to counteract excessive volatility. The Bank acted decisively to avoid the negative consequences of the exchange rate overreacting to shocks. Acknowledging the difficulties involved in identifying “excessive” exchange rate shocks, the Central Bank’s interventions are not so much aimed at maintaining a particular exchange rate level, but rather at avoiding major exchange rate volatility.

Since the flexible exchange rate regime was introduced in 1999, the Central Bank has considered on two occasions that exchange rate depreciations were large enough to warrant its intervention in the market. In both cases, the CBCh pre-announced the time horizon for its sterilised intervention (August-December 2001 and October 2002-February 2003), as well as the total amount of resources that would be used and the form of the intervention.² However, specific amounts and dates of each intervention were not provided in advance. An empirical evaluation of the specific interventions implemented during these periods suggests that their effects on the spot market were slight and in most cases negligible. However, the evidence also shows that the announcements themselves affected the spot exchange rate significantly; ie the impact of Central Bank actions at the level of the exchange rate arose mainly from the authorities’ public announcement.³

The current exchange rate regime provides indirect mechanisms to deal with volatile capital flows. In the first place, since the exchange rate fluctuates according to market conditions, possible gains from betting against the authorities are not present, thereby eliminating a potential source of capital flow volatility (speculation against the currency and the currency regime). In this sense, a flexible exchange regime provides an effective buffer against this source of volatile capital flows. Second, the CBCh maintains significant international reserves. Hence the monetary authority has the means to act against any excessive (temporary) exchange rate depreciation and volatility, in the event of a large liquidity shock.

The floating exchange rate mechanism was complemented in 2000 by regulations on currency risk of banks and, indirectly, of corporations. The Central Bank and the Superintendency of Banks established rules that limit currency mismatches of banks and that require them to consider the exposure to currency risk of their clients when assessing their creditworthiness. Thus, currency mismatches in companies translate into higher capital requirements for those banks that lend to them. This policy has significantly increased the resilience of the banking and corporate sector to exchange rate shocks.

II.4 Monetary and fiscal policy coordination

The policy framework adopted by the Central Bank is complemented and supported by a responsible and sound fiscal stance. In fact, the Ministry of Finance has adopted a structural surplus rule. This rule - quite exceptional in the world - defines a resource envelope for fiscal policy, determined as an annual structural budget surplus⁴ equivalent to 1% of GDP. The difference between the structural and the actual budget surplus is determined by the deviation from trend levels of GDP and the price of copper, weighted by their impact on government revenue. Accordingly, the government recorded actual deficits during 2000-03 and is expected to record a budget surplus in 2004, thus satisfying the 1%-of-GDP structural surplus rule since its inception.

Fiscal policy therefore plays a significant counter-cyclical role, thus complementing the CBCh’s counter-cyclical policy framework. Counter-cyclical or stabilising policies are only feasible when

² On both occasions the Central Bank announced that it would intervene both directly in the spot market and through swaps between domestic currency- and foreign currency-denominated bonds issued by the Bank.

³ See Tapia and Tokman (2004).

⁴ At the general-government level.

macroeconomic institutions are strong and policy rules are credible. Recent international evidence shows that countries with low risk premia on their sovereign liabilities are more likely to adopt counter-cyclical policies.⁵ Among these, Chile, with a country risk premium currently below 100 basis points, has applied some of the strongest counter-cyclical policies among emerging economies, contributing more effectively to stabilising output.

Institutionalisation of policy rules by both the Ministry of Finance and the Central Bank has simplified policy coordination. The Chilean experience illustrates that, in the presence of strong institutions and policy rules, policies can be coordinated by design, and there is less conflict over the best response to any given shock that affects the economy.

III. Capital account liberalisation and institution building

Historically, Chile has had capital account restrictions through most of the 20th century, starting in a context of high inflation and State intervention in the early 1930s. During the second half of the 1970s, the country started to open up its capital account, following a trade liberalisation programme initiated in 1974. The opening up of the capital account was implemented in the context of a fixed exchange rate regime, widespread indexation and a financial sector that lacked the required prudential regulation and supervision. Despite the official position, market agents tended to operate under the assumption that the government somehow backed the soundness and creditworthiness of local financial institutions and insured the deposit base. This set the stage for an explosion of moral hazard problems, which were facilitated by capital inflows. Due to inadequate regulation and supervision, levels of indebtedness, maturity gaps between assets and liabilities, related-lending, and foreign currency mismatches received less attention than they deserved.

Weak institutions and macro-fundamentals added up to a fragile economic policy framework, leaving the economy vulnerable. When the 1981 international recession hit with unexpected severity, it abruptly ended efforts to open up the capital account, given the sudden stop of capital flows to developing countries. The deep financial crisis that ensued led to a rapid drain on international reserves, and the fixed exchange rate regime was abandoned. The devaluation that followed provoked severe losses across all sectors of the economy.

In the aftermath of the debt crisis, in the mid-1980s, the authorities focused on economic recovery and reorganised the overall macro-financial framework. Drawing on the recession experience and the subsequent financial crisis, a new banking law was enacted in 1986 that addressed *moral hazard* and *systemic risk* issues, and regulations governing financial institutions were upgraded to strengthen the financial sector.

In the early 1990s several factors - including a successful transition to democracy - favoured the voluntary return of capital flows to Chile. Given the macroeconomic policy framework, the authorities faced a classical monetary policy dilemma, with more policy goals than independent instruments. The level of domestic interest rates necessary to control aggregate demand gave rise to incentives for interest-arbitrage capital inflows, within a broader context of a sharp increase in capital flows to most emerging economies. The choice was either to accept an appreciation of the real exchange rate inconsistent with external balance, or to reduce interest rates, in which case the risks of exchange rate appreciation would remain small, but inflationary risks would dominate the picture in a highly indexed economy.

The policy options available included allowing the exchange rate to appreciate, limiting appreciation through sterilised intervention accompanied by tight fiscal policy to offset the associated costs, or introducing controls on capital inflows, and at the same time liberalising capital outflows. Chile's strategy involved a combination of all these options.

In terms of capital outflows, the opening of the capital account went ahead relatively quickly. In 1991, the procedures for direct investment abroad were streamlined, and banks could invest abroad up to

⁵ Calderón and Schmidt-Hebbel (2003) and Calderón et al (2004) provide evidence that emerging economies with low (high) country risk premia (an inverse measure of policy credibility) exhibit counter- (pro-)cyclical fiscal and monetary policies.

40% of their foreign currency deposits. In 1992, the limit on banks' foreign exchange holdings doubled and export proceeds exempt from surrender requirements were increased. In 1994, restrictions on profit remittances were lifted, banks were allowed to invest up to 20% of their capital and reserves abroad, and the ceilings on institutional investors' investment abroad were raised. In 1995, the minimum holding period for foreign direct investment in Chile was reduced from three years to one. In 1998, the ceiling for banks' investment in assets denominated in foreign currency was raised to 70% of their capital and reserves, and the ceiling for mutual funds was eliminated. Ceilings on investment abroad were also increased for pension funds and life and general insurance companies. All these measures contributed to an increase in Chile's degree of international financial integration.

With regard to capital inflows, a more gradual approach was followed during the transition to price stability, as independence of monetary policy in a context of limited exchange variability depended on some degree of capital controls. Thus, an unremunerated reserve requirement (URR) was introduced in June 1991, in response to a surge in capital flows. Other important controls were a minimum holding period for portfolio investments and stringent requirements for issuing bonds and American depositary receipts (ADRs) abroad.

From a macroeconomic point of view, the URR was expected to enhance the autonomy of monetary policy and simultaneously minimise the effects on the exchange rate of the tight monetary policy needed to control aggregate demand. From a macro-prudential point of view, the URR was expected to discourage short-term capital inflows without affecting long-term foreign investment, especially foreign direct investment. This was expected to reduce the volatility of international capital flows into the country and, subsequently, exchange rate volatility.

The URR remained in effect during most of the 1990s and in the aftermath of the Asian crisis. But in late June 1998, in light of strong pressure against the peso, the Central Bank cut the URR from 30% to 10%, and then to zero in September of that year, although it remained as part of the CBCh regulations.

Overall, several studies suggest that the URR had the following effects on the Chilean economy (Valdés and Soto (1998), Edwards (1998, 2000), De Gregorio et al (2000), Gallego et al (1999), Gallego and Hernández (2002)):

- (a) It created a wedge between domestic and external interest rates, allowing monetary policy more independence;
- (b) It modified the composition of capital flows, raising the share of medium- and long-term inflows;
- (c) It did not, however, affect the real exchange rate or the overall size of capital inflows;
- (d) It discriminated against small and medium-sized companies, as the cost of the URR weighed more heavily on small businesses, which faced stricter financial restrictions and higher financing costs;
- (e) Loopholes had to be constantly plugged, as private agents had a substantial incentive to elude the regulation;
- (f) It produced some distortions in capital versus labour costs, redistributing income in favour of the owners of capital, and distorting resource allocations somewhat.

At the regulatory level, the URR was finally removed in April 2001, as part of several measures applied to increase Chile's financial integration with the rest of the world.

Achieving the medium-term objective of completely opening up the capital account was possible once the authorities considered fundamentals and institutions to be strong enough to shield the economy from external shocks, and thus able to give Chile the full benefit of a higher degree of financial integration. These conditions included:

- (a) Adoption of a floating exchange rate regime within an inflation targeting framework;
- (b) Price stability;
- (c) Prudential regulation and supervision of the financial sector, including regulations on currency mismatches;
- (d) Development of markets for derivative instruments to provide better coverage of exchange risk;

- (e) A suitable level of international reserves;
- (f) A more diversified trade structure;
- (g) A solvent financial system; and
- (h) A solid and prudent fiscal position, characterised by a fiscal rule targeting a structural surplus of 1% of GDP.

Once these preconditions were met, Chile moved on to its current stance, and has had a fully open capital account regime since 2001. The only foreign exchange regulations that remain specify reporting requirements for statistical purposes.

IV. Financial market integration and domestic markets and institutions

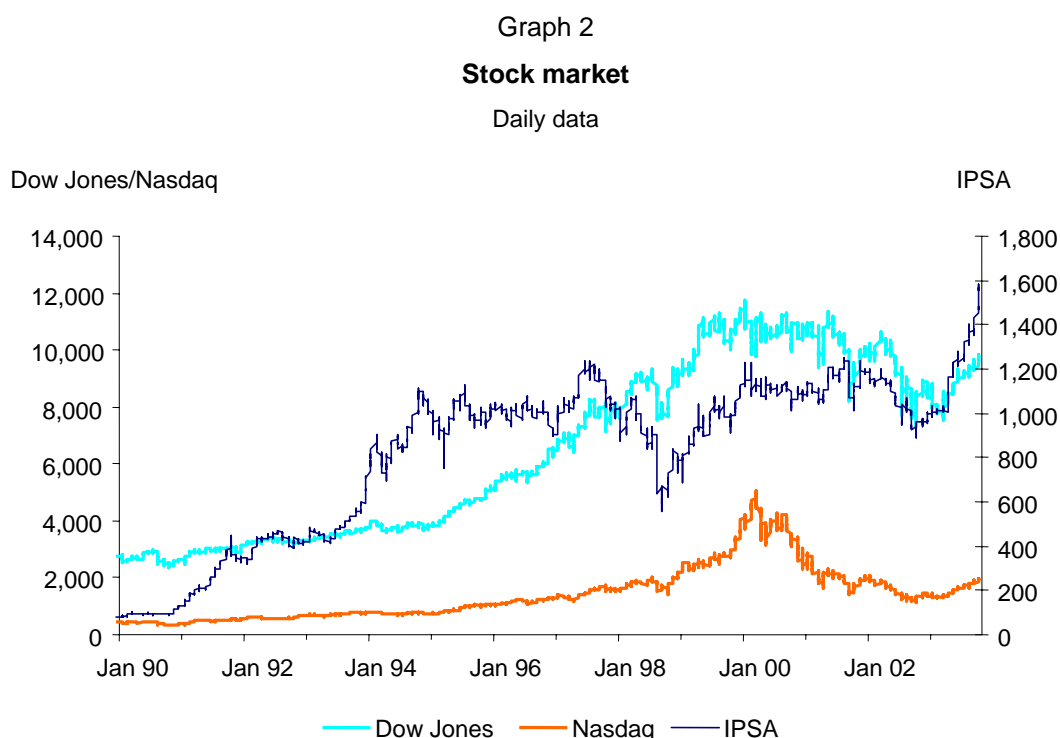
In this section we look at concrete measures of financial integration in the Chilean economy in order to assess its extent and evolution during the 1990s. We first analyse the case of stock and fixed income instruments, by correlating the returns in local and US markets. Then we analyse the access of local companies to external funding. In particular, we are interested in determining whether foreign control has increased local companies' access to international capital markets, thus facilitating financial integration.

IV.1 Financial integration and domestic markets

A similar framework is used for both stock and fixed income instruments, comparing daily returns (in US dollar terms) during the 1990s. In order to capture the evolution of financial integration over time, two-year moving windows were used in the estimation process.

IV.1.1 Stock markets

Daily returns of the local market index (IPSA) were compared with those from the Dow Jones and Nasdaq indexes between 1989 and 2003, using a two-year moving window (see Graph 2).



Since the data series are stationary, we can estimate the following equation on returns:

$$\text{dlog}(\text{IPSA}/e) = c + \alpha \cdot \text{dlog}(\text{DowJones}) + \beta \cdot \text{dlog}((\text{IPSA}/e)(-1)) \quad (1)$$

where the log differences correspond to the returns of the series. The coefficient α measures the degree of correlation between the IPSA and Dow Jones returns. The coefficient β , in turn, captures the importance of returns in the previous period in explaining today's return. If there is a contemporaneous correlation between IPSA and Dow Jones, then the lag of only one of them suffices to capture serial correlation. Finally, e is the peso/dollar exchange rate. As mentioned, a two-year moving window was estimated for the period, meaning that we have about 500 estimates for each of the parameters. Table 1 shows the average of the estimates for both the Dow Jones and Nasdaq equations.

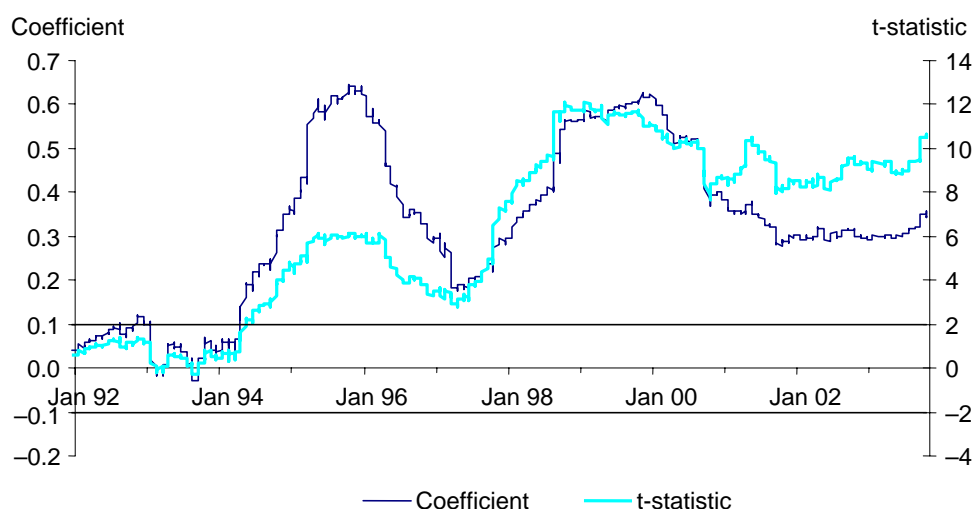
Table 1
Average of the estimates of daily IPSA returns
in US dollars

Explanatory variable	c	Return in the foreign market	IPSA $e(-1)$	R^2
Dow Jones	0.0	0.25	0.15	0.08
Nasdaq	0.0	0.20	0.16	0.08

The lagged variable is always significant. The explanatory power of the equations, as measured by their R^2 , is low as is usual with this type of estimation. The significance of the return in the foreign market varies over time. Graph 3 shows this evolution for the Dow Jones returns.

Graph 3 shows the value of the coefficient on the left-hand axis and the significance on the right-hand one. A band between the values -2 and 2 on the right-hand axis shows the area where the t-statistic indicates that the estimate is not significantly different from zero. The horizontal axis indicates the last date included in the window estimation period.

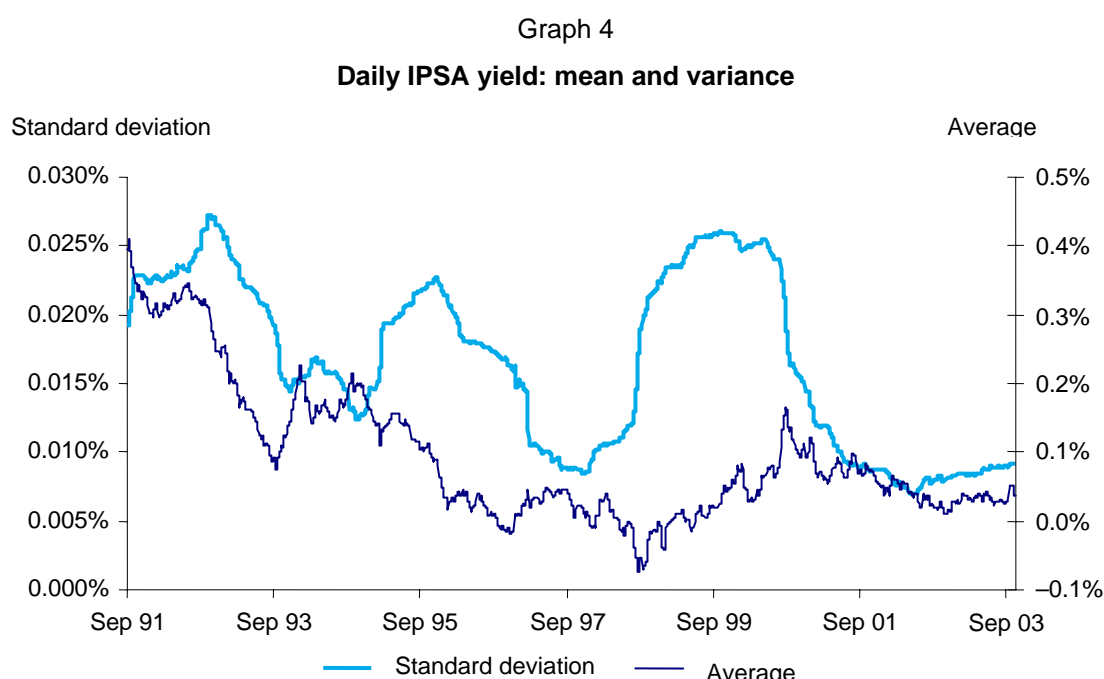
Graph 3
Correlation of daily returns between IPSA and Dow Jones



Correlation between the local and foreign stock market becomes significant by mid-1994, with significance becoming stronger as we move forward through the sample. This indicates that financial integration at the level of stock markets became a significant phenomenon by mid-1992. Significance shows a second increase at the end of 1997 (corresponding to data beginning at the end of 1995).

The value of the estimated parameter α fluctuates between 0.1 and 0.5 in the case of the Dow Jones and 0.05 and 0.4 in the case of the Nasdaq. Estimates of α show two peaks (during 1995 and from mid-1998 to mid-2000). These correspond to episodes of strong co-movements across markets that are captured by the moving window. The second peak, for example, corresponds to the sharp fall in foreign markets of October 1998, which was replicated in the local market.

The impact of increased integration on *market volatility* is ambiguous in theory. On the one hand, the larger investor base can help to reduce the effect of local shocks. On the other, external shocks are more easily transmitted to the local market. Graph 4 shows the standard deviation and average of a two-year window of daily returns, measured on the left- and right-hand side, respectively. In the early 1990s, where we found that integration was low, our measure of volatility is the highest of the whole sample. Volatility shows a general declining trend, except for the specific episodes already mentioned, where volatility rose temporarily.



Thus, we conclude that financial integration increased at the stock market level during the 1990s, while volatility seems to have declined with market integration.

IV.1.2 Interest rates

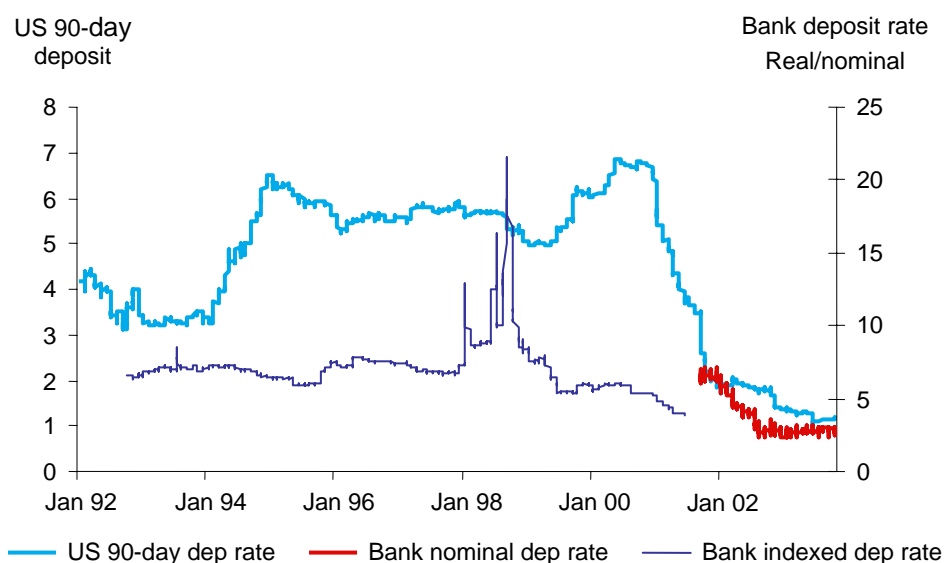
In the case of correlations in interest rates we looked at the evidence of money markets and the market for long-term bonds (see Graphs 5 and 6). The first is the market targeted by monetary policy and will be our test of monetary independence. The longer-term market will give us a better idea of financial integration, since it is less influenced by monetary policy.

Regarding the money market, we compared the US three-month deposit rate with the domestic 90-day indexed deposit rate, using two-year moving windows. After July 2001, when the CBCh started targeting nominal interest rates, we compared nominal rates over six-month moving windows.

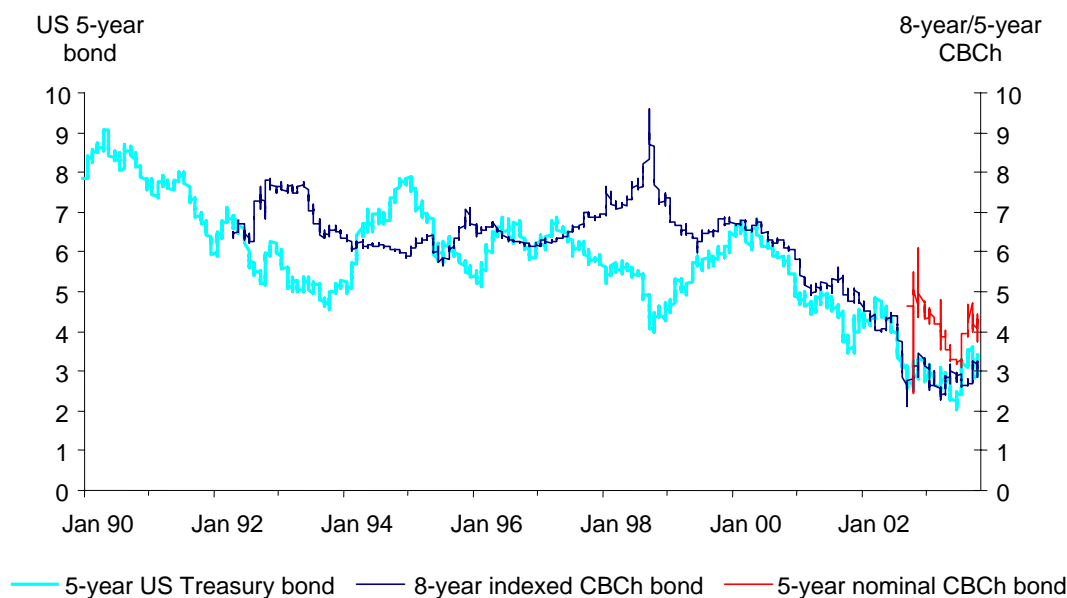
We find that the coefficient that captures the partial correlation between domestic and foreign rates is not significant in all specifications. This evidence points towards independence of monetary policy throughout the period.

In the case of the long-term market we compared the rates on a five-year US Treasury bond with those of an eight-year Central Bank indexed coupon bond (which has a similar duration).

Graph 5
Short-term internal and external interest rates
 Daily data



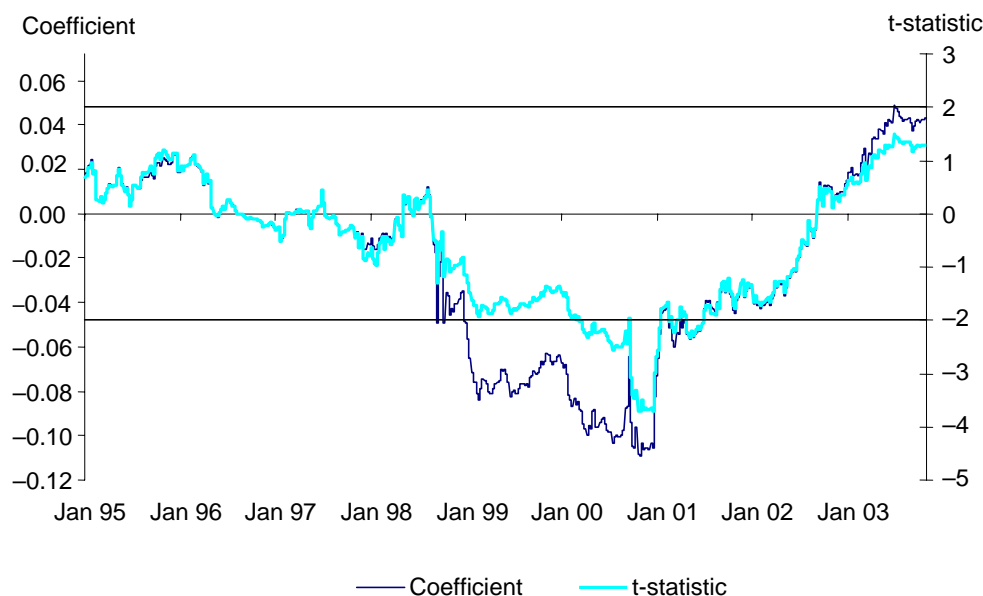
Graph 6
Long-term internal and external interest rates
 Daily data



We used daily data for domestic and foreign rates and six-month and two-year moving windows to evaluate the evidence. The estimated correlation coefficient is not significant for most of the sample (see Graph 7), except for the estimates that cover 1998. During that year, the monetary authorities reacted to pressure on the exchange rate by significantly increasing domestic interest rates. The CBCh moved to a free float regime in September 1999. Since that period, we observe a higher association between internal and external long-term rates, as Graph 6 shows. Correlation estimates take positive values, but are not significant. This may be an indication that the similarity in the

evolution of these interest rates may be the result of similar real shocks that affected both economies in this period, which generated similar market responses.

Graph 7
Correlation between domestic and foreign long-term rates



We also ran a separate estimation for the period after September 2002, using the new five-year Central Bank bullet bond. This instrument is more comparable to the five-year US Treasury bond, since they are nominal and have the same coupon structure. In this case we use a six-month window, since we have less data. Correlation in this case is significant for most of the sample, suggesting the existence of financial integration.

Given the conflicting evidence obtained above, we decided to conduct an alternative test of financial integration, using the interest rate parity equation. This relation states that the difference between internal and external interest rates is equal to the expected appreciation or depreciation of the local currency. However, empirical tests of uncovered interest rate parity usually fail. Given this fact, we focus on the correlation between the interest rate differential and the expected currency appreciation/depreciation.

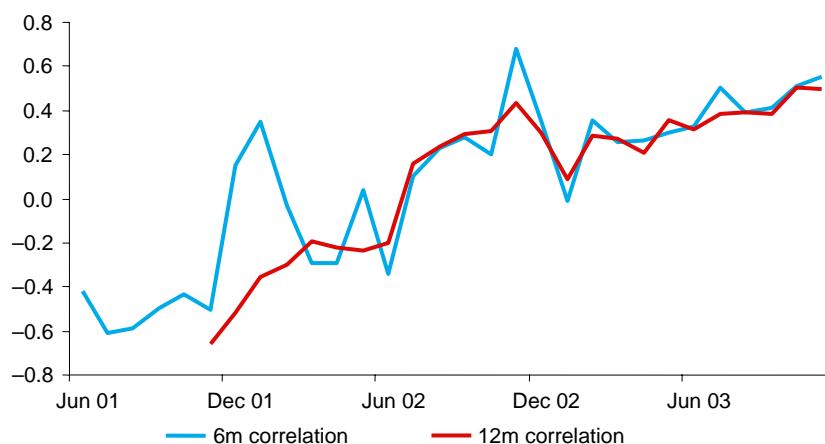
The interest rate parity equation is:

$$i_t - spread_t - i_t^* = E(e_{t+1} - e_t),$$

where E is the expectations operator. To generate the expected appreciation/depreciation series we use the monthly Survey of Expectations of the Central Bank of Chile. This survey has existed since December 2000. It asks for the future value of the US dollar, from which we calculate expected changes in the exchange rate over a 12-month horizon.

To compute the interest rate differential, we used a five-year US Treasury bond interest rate as the external rate. For the internal interest rate we used two alternatives. First, we used the real eight-year CBCh coupon bond (PRC-8) rate, adding an estimate for expected inflation. The latter was assumed to be 3% between December 2000 and September 2002. From this date onwards, we computed expected inflation as the difference between the nominal (BCP-5) and real (BCU-5) yields on five-year CBCh bonds. A second method was to make direct use of the BCP-5 nominal bond, which has existed only since September 2002. The two methods give very similar results. Graph 8 shows the evolution of the correlation of the interest rate differential with the expected change in the exchange rate.

Graph 8
Expected depreciation and interest rate differential
 Six- and 12-month correlation coefficient



The correlation between the interest differential and expected depreciation was calculated using windows of six and 12 months of monthly data. Graph 8 suggests that this correlation has increased over time, growing towards one, especially after December 2001. A factor that may help explain this higher correlation is the issuance of new bonds by the CBCh since September 2002. These bonds are closer in format to international standards and may facilitate comparison, and therefore arbitrage.

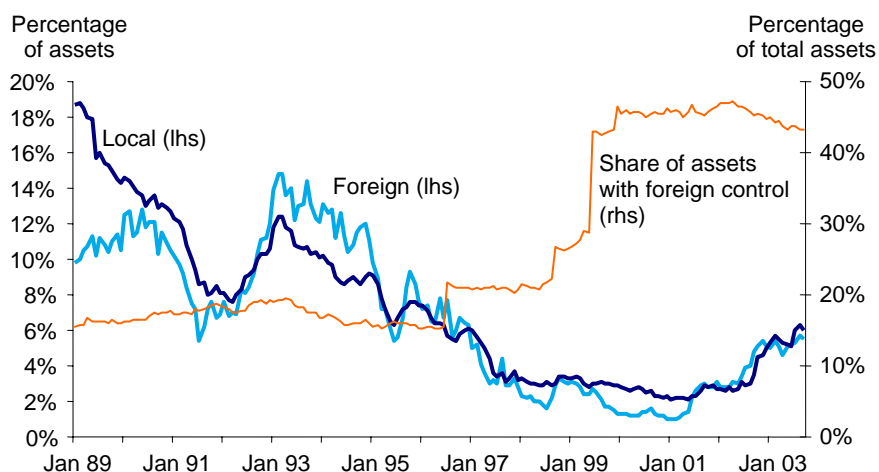
IV.2 Financial integration and institutions

In this section we study how financial integration affected the capacity of local firms to access foreign sources of capital. We centre the analysis on whether foreign control has an impact on the ability to tap foreign capital markets in the case of banks and firms.

IV.2.1 Banking sector

In the last 10 years foreign control of the banking system has more than doubled in terms of assets, increasing from 16% in the mid-1990s to 43% today. However, the increase in foreign ownership in a period of higher financial integration does not seem to make a difference in terms of access to foreign funding. The latter seems to be driven mainly by market conditions, and locally and foreign-controlled banks exhibit a similar pattern, as shown in Graph 9.

Graph 9
Foreign debt as a percentage of total assets, by nationality



IV.2.2 Firms

We analysed a sample of the largest 100 companies that report to the Superintendency of Securities and Insurance, which represent 84% of the assets of all reporting firms. Any firm that issues publicly traded instruments, either equity or bonds, has to report to this regulatory body. State-owned companies were not considered in the sample. Foreigners control 48% of assets, with the remainder in control of nationals. Our main findings are shown in Table 2.

Table 2			
Debt as a percentage of assets			
	Control		Total
	Foreign	Local	
Debt with foreign banks	12.9%	2.4%	7.4%
Bonds issued abroad	11.4%	2.0%	6.5%
Debt with local banks	3.2%	3.9%	3.6%
Bonds issued locally	10.5%	7.0%	8.7%
Total debt	38.0%	15.3%	26.0%

Source: Calculations based on SVS balance sheet data.

Table 2 shows two facts: (i) foreign-controlled firms use more debt than locally controlled firms to finance their assets, and (ii) foreign firms make more extensive use of foreign markets for funding. Even after controlling for higher debt use, foreign firms obtain 64% of their funding abroad, while foreign debt amounts to only 29% in the case of local firms. This might be a manifestation of the “home bias” described by Feldstein and Horioka (1980), who interpret their results as an indication of incomplete financial integration.

One argument against this finding is that foreign investment is concentrated in sectors that use debt more intensively. Inspection of the sectoral composition of the data renders this argument invalid. Excluding public infrastructure concessionaires, which include only foreign-controlled firms, we observe in Table 3 that the bias towards foreign funding of foreign-controlled firms actually increases from 64% to 70%. The extent of the use of debt by foreign firms diminishes, but still doubles that of local firms.

Table 3			
Debt as a percentage of assets (excluding infrastructure)			
	Control		Total
	Foreign	Local	
Debt with foreign banks	12.9%	2.4%	7.2%
Bonds issued abroad	10.2%	2.0%	6.2%
Debt with local banks	2.1%	3.9%	3.2%
Bonds issued locally	7.7%	7.0%	7.8%
Total debt	33.0%	15.3%	24.4%

Source: Calculations based on SVS balance sheet data.

We next refined our analysis by excluding Spanish-controlled power generation and distribution companies, which represent 19% of total assets in our sample, as these companies make extensive use of debt and obtain a significant part of it abroad. Table 4 shows that the overall leverage of foreign-controlled firms decreases significantly, but is still 70% higher than that of local firms. External funding by foreign-controlled firms drops to 52% of assets, but is still much higher than the 29% figure observed in locally controlled firms.

Table 4
**Debt as a percentage of assets
(excluding Spanish-controlled firms)**

	Control		Total
	Foreign	Local	
Debt with foreign banks	8.9%	2.4%	4.7%
Bonds issued abroad	4.9%	2.0%	4.2%
Debt with local banks	3.1%	3.9%	4.4%
Bonds issued locally	9.5%	7.0%	10.1%
Total debt	26.5%	15.3%	23.3%

Source: Calculations based on SVS balance sheet data.

In sum, we conclude that foreign ownership does make a difference in the case of firms. Foreign-controlled firms exhibit significantly higher leverage than locally controlled firms. Moreover, foreign-controlled firms tend to use external sources of funding more intensively than locally controlled firms in all sectors of the economy. This result was robust to various adjustments to control for sector-specific characteristics.

V. Concluding remarks

Thirty years after its first capital account liberalisation, Chile is today fully integrated into world financial markets. But before reaching this stage, the country paid significant costs and learned important lessons. The most important is that financial integration has many benefits, but also entails risks. In order to deal with these risks, solid fundamentals and strong institutions are required. The institutional cornerstones of Chile's current macroeconomic stability include a monetary policy based on inflation targeting, a fiscal policy based on a structural budget surplus rule, and a floating exchange rate regime, all complemented by strong but evolving financial sector regulation and supervision.

This policy and institutional framework has reduced the potential costs derived from internal factors, such as policy inconsistencies, one-way bets, implicit insurance or moral hazard. At the same time, it cushions the effects of volatile capital flows, as adjustments are made to a larger extent through prices rather than quantities, with agents internalising inherent risks.

Today Chile is enjoying the benefits of international financial integration with reasonable assurances against the risks associated with free and volatile capital flows. To be sure, many challenges remain, among them ongoing fine-tuning of the monetary policy framework, consolidation of the fiscal policy framework, modernisation of the financial sector, and expansion of the benefits of financial integration.

Our empirical analysis suggests that the Chilean economy has been highly integrated at the level of stock markets since 1992, and that stock market volatility declined with financial integration. Financial integration is not present at the level of short-term fixed income instruments, which is a sign of monetary independence. But there are increasing signs of financial integration in the behaviour of long-term bond rates after 2001. We also found that foreign ownership does not seem to make a difference in terms of access to foreign funding in the Chilean banking sector. But foreign ownership does make a difference in the case of firms. Foreign-controlled firms exhibit higher leverage ratios and

use external sources of funds more intensively than locally controlled firms. This may be a sign of incomplete financial integration at the firm level.

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Challenges to China's monetary policy

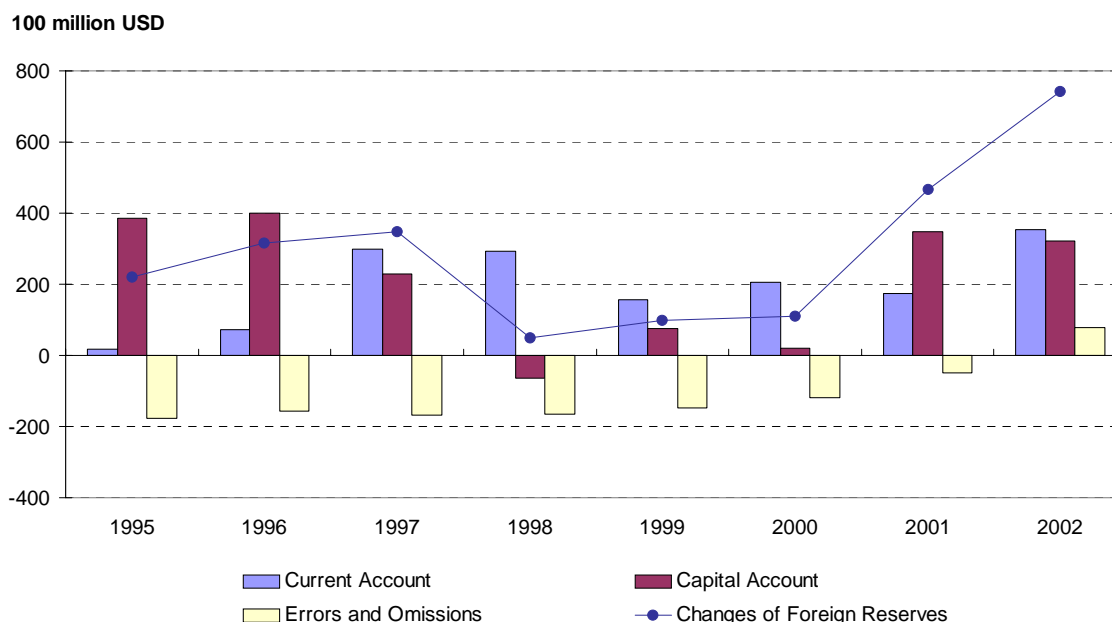
People's Bank of China

In recent years, China's economy has witnessed rapid, sustained and healthy growth, particularly after its accession to the WTO. Regardless of the considerable negative impact of SARS on several sectors and regions, GDP grew 9.1% in 2003, while CPI rose by 1.2%. Nonetheless, with financial and economic globalisation and domestic reform well under way, China's monetary policy now faces severe challenges.

1. Strong growth of foreign reserves makes neutralisation more difficult

China enjoys a balance of payments surplus, due to its robust growth and improving external conditions, which has resulted in rapidly increasing foreign reserves (Graph 1). The surplus is largely on the capital and financial accounts, with current account surpluses kept small and declining. From 1994-2003, the annual current account surplus averaged USD 19.9 billion, while the annual capital and financial account surplus reached USD 22.2 billion. In the first half of 2003, the current account surplus actually declined year on year, while the capital account surplus grew significantly. FDI proved to be the major source of capital inflows, with the FDI surplus totalling USD 26.9 billion in the first half (total capital account surplus amounted to USD 44.4 billion). As a result, foreign reserves reached USD 346.5 billion by the end of June 2003.

Graph 1
Changes in China's BOP and foreign reserves



The People's Bank of China (PBC) has clarified that its policy is not aimed at trade surplus, but at a relatively balanced current account. In order to maintain a sound balance of payments position, the People's Bank of China has made efforts to relax constraints on foreign exchange purchases by both enterprises and individuals, including:

- Considering the adoption of a Qualified Domestic Institutional Investors (QDII) system, following the adoption of the Qualified Foreign Institutional Investors (QFII) system.

- Relaxing the constraints on enterprises' foreign exchange holdings.
- Simplifying verification procedures for both imports and exports.
- Modifying regulations on multinationals' non-trade foreign exchange sales and purchases, so as to facilitate their operation in China.
- Raising the limit for individuals' foreign exchange purchases and relaxing the restriction on foreign currency taken abroad.
- Launching a pilot project on the reform of overseas investment regulation, gradually expanding channels for capital outflow.

Since 2003, mounting pressure on China from abroad to appreciate its currency has triggered overreaction in financial markets, leading them to expect a renminbi appreciation. To maintain the economic stability of China and of Asia as a whole, China has taken steps to alleviate the appreciation pressures and maintain economic equilibrium both domestically and externally. First, it adheres to its commitment of keeping a stable renminbi. Second, efforts are being made to achieve a sound balance of payments position. Third, open market operations (OMOs) to sterilise the monetary impact of reserves have intensified since 2003. In particular, gross issuance of central bank bills by the PBC amounted to RMB 455 billion in the first eight months of 2003. In addition to OMOs, the PBC raised the reserve requirement by 1 percentage point, so as to moderate pressures on the monetary base and the monetary supply posed by the increasing renminbi position resulting from foreign exchange purchases. Fourth, the PBC has been keeping a closer watch on exchange rate movements of the renminbi and international currencies.

Due to moderate global political conditions and reduced uncertainties, the world economy has gained momentum and external conditions for China are expected to improve further. In this setting, imports and exports will still be substantial and capital inflow will still see a rapid increase. Nonetheless, further US dollar weakness may lead to additional appreciation pressure on the renminbi. The renminbi interest rate is higher than the US dollar interest rate following successive interest rate cuts in the United States, which creates arbitrage opportunities between the renminbi and the US dollar. Consequently, sales of foreign exchange could increase significantly and sterilisation could become even more difficult and costly.

2. A partially overheated economy fuels underlying inflation pressure

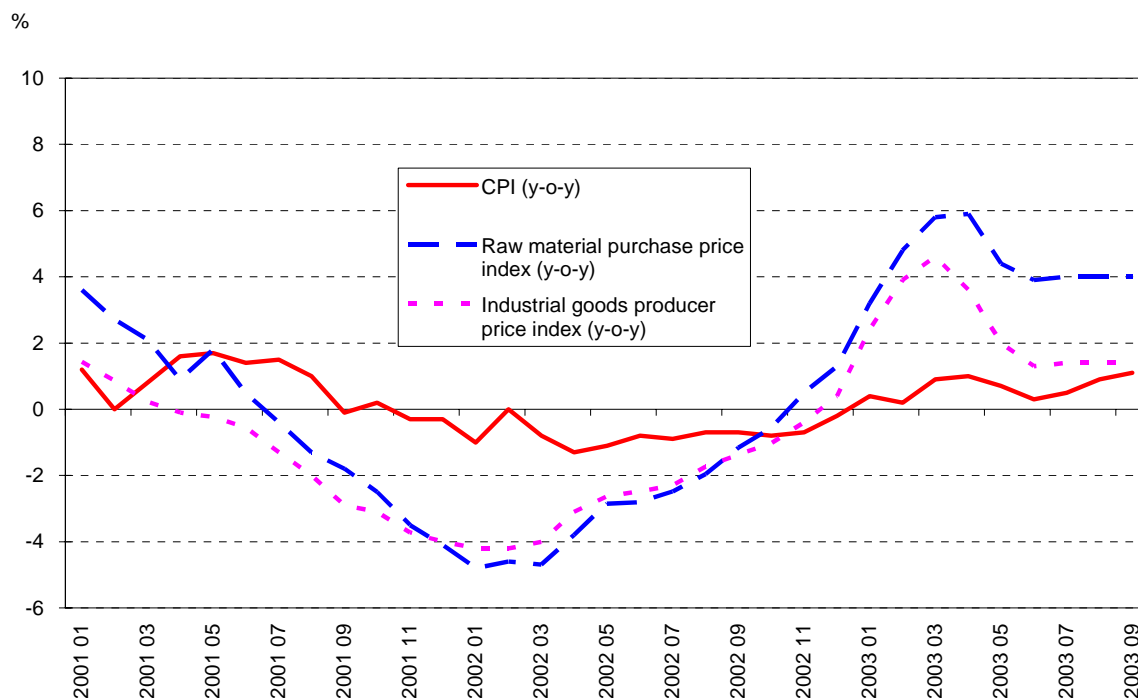
The partial overheating can be seen in three aspects:

- There has been a substantial increase in fixed asset investment in several sectors and regions.
Total fixed asset investment increased by 30.5% in the first three quarters of 2003, of which investment in the real estate sector increased by 33%. In the first eight months of 2003, real estate investment increased by over 50% (in some cases nearly 90%) in eight provinces out of the total 31 provinces and municipalities. Additionally, the investment structure in the real estate sector is not reasonable, with investment in residential space rising only by 28% and that in office building and commercial space rising by 39.8% and 44.6% respectively.
- Some industrial sectors experienced rapid growth and overlapped construction emerged again, which could lead to excess supply in these sectors in the future. In the first eight months, investment in steel, cement, aluminium, automobiles and textiles increased (year on year) by 140%, 130%, 150%, 84% and 140% respectively.
- Rapid investment growth has mainly been financed by the high increase in bank credit. Bank credit has funded 25% of fixed asset investment, which increased by 52%. The especially rapid growth in some sectors may thus imply significant financial risks. By the end of September, total outstanding loans, including RMB and foreign currency loans, had increased by 23.7%. New lending (net) reached RMB 2.7 trillion, 1.3 trillion higher than in the same period last year. RMB new lending (net) increased by RMB 2.5 trillion, 1.1 trillion higher than in the same period last year, or RMB 620.3 billion higher than all of 2002.

In response to overheating, the PBC mainly resorted to economic management efforts to contain the particularly large increase in the credit and monetary supply. This included open market operations to drain liquidity, higher reserve requirements, window guidance and structural adjustments (for instance, intensified regulation of lending to the real estate sector and a clampdown on illicit real estate loans). In general, policy measures taken have started to take effect. However, to completely eliminate the source of overheating requires further reforms on investment and financial institutions and greater efforts to boost capital markets to reduce the proportion of indirect financing.

Associated with the partial overheating of fixed asset investment, producer prices and real estate prices rose continuously, with only a moderate rise in CPI. Therefore, China's monetary policymakers have to be alert to either inflation or deflation, which highlights the importance of a correct assessment of the economic outlook. In the first nine months of 2003, CPI rose by only 0.7% year on year, which indicates that the large increase in credit and monetary supply since the last quarter of 2002 has not been fully reflected in CPI. However, the underlying inflation pressures are still worth monitoring closely. Once inflation pressures are transmitted to asset prices, including prices of real estate, stocks or other investment instruments, a bubble could take shape, which is even more damaging. On the other hand, the moderate positive increase in CPI mainly came from price rises for food and some services, whereas the movements in food prices mainly reflected seasonal factors and some external shocks, including SARS or natural disasters. According to the estimate of the National Bureau of Statistics, food prices rose by 2.2% in the first three quarters, which contributed 0.7 percentage points to the increase in the overall price level. In other words, if food and energy are excluded from the CPI basket, the core inflation could be negative, representing a still oversupplied market.

Graph 2
Changes in price indices in China



3. The rising money market interest rate highlights the importance of coordination between monetary and fiscal policy

After late August 2003, the interest rate in the money market rose rather quickly, due to the increase in reserve requirements and new stock issues. From 23 August to 30 September, the interbank lending rate gained 45 basis points and the repo rate 97 basis points. The rapid rise in the money market interest rate led to a substantial increase in the cost of bond financing and therefore a sharp decline in treasury bond prices. To maintain the stability of the money market interest rate, the PBC employed

various monetary policy instruments, including combined open market operations of various types and maturities. The aim was to meet the need for liquidity of the financial system and ensure steady growth of the monetary base. Given that treasury bonds in China are mainly in medium and long maturities, instruments for open market operations are rather limited. As bond financing becomes more costly and the contribution of debt service payments to the fiscal deficit increases significantly, the Ministry of Finance is planning to adjust the maturity structure of treasury bonds, introducing more short-term treasury bonds.

Faced with a complex economic and financial situation both at home and abroad, and severe challenges to monetary policy, the PBC will continue to be forward-looking, active and flexible in its monetary policy management. At the same time, it will keep on improving indirect management and enhancing coordination among various macroeconomic policies. Only in this way can the renminbi's value be secured and monetary policy's ultimate target of boosting economic growth be achieved.

Capital controls and foreign exchange market intervention in Colombia

José Darío Uribe¹

1. Introduction

This paper examines two aspects of the Colombian experience with capital flows between 1990 and 2003. First, it discusses capital account liberalisation, the evolution of external debt and the role of the price-based capital account regulations imposed in Colombia in September 1993. Second, it describes the intervention mechanisms set up by Banco de la República (the central bank) from September 1999 onwards, when the crawling exchange rate band system was abandoned and a free float was adopted in a fully fledged inflation targeting regime.

The main conclusions are as follows: (i) the price-based capital account regulations improved the profile of external debt and may have reinforced monetary control in a period of strong capital inflows to the country; (ii) the low level of short-term external debt did not reduce Colombia's vulnerability to the effects of a "sudden stop" in capital inflows to the region in the years 1998-99; (iii) the price-based capital account regulations (or non-remunerated deposits) provided an unwarranted protection to the domestic financial system that resulted in a broadening of intermediation margins, while simultaneously supporting the fiscal expansion of the period 1993-97; (iv) the development and use of an option-based auction mechanism to execute foreign exchange market intervention has allowed the central bank to achieve its foreign exchange intervention goals; and (v) the efficiency of a sterilised foreign exchange intervention performed to stop a devaluation - which compromises the inflation target - works primarily through the signalling effect sent to the market by the central bank. Selling a limited amount of international reserves does not seem to have a significant or lasting impact on exchange rate dynamics.

2. Liberalisation, flows and capital controls

A. The liberalisation of the capital account

Colombia, like other Latin American countries, liberalised its capital account at the beginning of the last decade. This was part of a process called "economic opening" that included trade liberalisation and the liberalisation of the local financial system.

The liberalisation of the capital account started with Law 9 of 1991, which modified the strict exchange control regime established in 1967 and allowed Colombian residents to hold and transact foreign currency at home and abroad. Thus, the central bank's monopoly in the exchange market was eliminated.

The liberalisation was executed in two phases. First, foreign direct investment (FDI) was, for the most part, liberalised and management of foreign exchange through national financial intermediaries or bank accounts abroad was authorised. However, restrictions on the final use of external resources (ie investment, imports and exports) for capital transactions remained and a minimum maturity (one year) was established for external loans. Access of foreign investment funds to the Colombian capital market was also authorised, as well as the issuance of bonds in foreign capital markets by Colombian firms.

¹ This paper was written in November 2003. I would like to thank Ramon Moreno for helpful comments. All opinions, errors and omissions are my own responsibility.

In the second phase, Resolution 21 of 1993 granted access to credits in foreign currencies to Colombian residents with both domestic and external financial institutions. The parties concerned were allowed to freely negotiate the relevant financial conditions, and no restrictions were applied to the use of these funds. Colombian residents were also authorised to invest freely in liquid assets abroad.

External factors, the structural reforms and the regulatory changes were quickly reflected in the evolution of capital flows. Both foreign direct and portfolio investment increased from 1992. In addition, private expenditure and investment began to be increasingly financed with external resources and the private sector started to invest abroad.

B. Evolution of capital flows

Table 1 summarises the evolution of capital flows and the financing of the current account in the period 1990-2003.² The following facts can be inferred:

- Two periods can be clearly defined in the evolution of capital flows. First, there is a period of strong capital inflows from 1990 to 1997. The consensus view in Colombia is that the figures for 1990 and 1991 (\$97 million and -\$420 million) understate capital inflows: during these years the private sector brought a substantial amount of capital through the current account in order to evade the capital controls that prevailed until September 1991. Second comes a period of net capital outflows or moderate capital inflows from 1998 to 2003. The year 2001 is atypical due to a strong increase in FDI and public external debt, which can be partially explained by the policy of prefinancing part of the public sector deficit for the year 2002.
- Private and public external debt exhibited differing trends. While private sector debt generally increased between 1990 and 1997, it subsequently fell for most of the period after 1998. The increase in private debt between 1994 and 1997 in part financed privatisation (by \$2.4 billion). Public debt fell in the first half of the 1990s and rose significantly after 1997. An important proportion of the increase in the public external debt from 1997 onwards reflected the financing of the rising central government deficit after 1995. Privatisation revenues virtually disappeared from 1997 onwards.
- FDI started to increase after 1992, accelerating in 1994 and reaching a peak in 1997. FDI inflows from 1998 onwards, although lower than those registered between 1994 and 1997, were higher than those observed in the first two years of the 1990s. Graph 1 shows the evolution of direct external investment for the period 1990-2003, by sector. Financial sector activities (22%), the electricity, gas and water sector (15%) and manufacturing (21%) are particularly important.
- The current account balance changed from a deficit of -\$5,800 million in 1997 to a surplus of \$671 million in 1999. The financial account moved from a surplus of \$6,587 million to a deficit of -\$555 million over the same period. A sharp decrease in external debt was only seen for the private sector; the public net debt figures for 1998, 1999 and 2001 are the highest observed in the sample period.

C. Controls on capital inflows

The capital account liberalisation of the 1990s was not a full liberalisation. Capital inflows were subject to six types of regulations: (i) a price control consisting of a reserve requirement which obliged debtors to maintain a non-remunerated dollar deposit at the central bank for a minimum period of time against short-term debt; (ii) controls on the net foreign exchange position of financial intermediaries ("posición propia") that prevented them from funding peso loans with external liabilities; (iii) restrictions over commercial debt, including a maximum period for the payment of consumption and intermediate goods imports and special quotas for export prefinancing; (iv) previous approval from the Securities Superintendency for foreign investment funds operating in Colombia; (v) taxes and explicit controls to reduce interest rate arbitrage in service transactions; and (vi) direct controls on illegal capital flows.

² For more details, see Alonso et al (2003): "Evolución de los flujos de capital y de la deuda externa del sector privado en Colombia, 1990-2003", *Borradores de Economía*, no 266, November.

Table 1
Colombia: capital flows and current account financing, 1990-2003

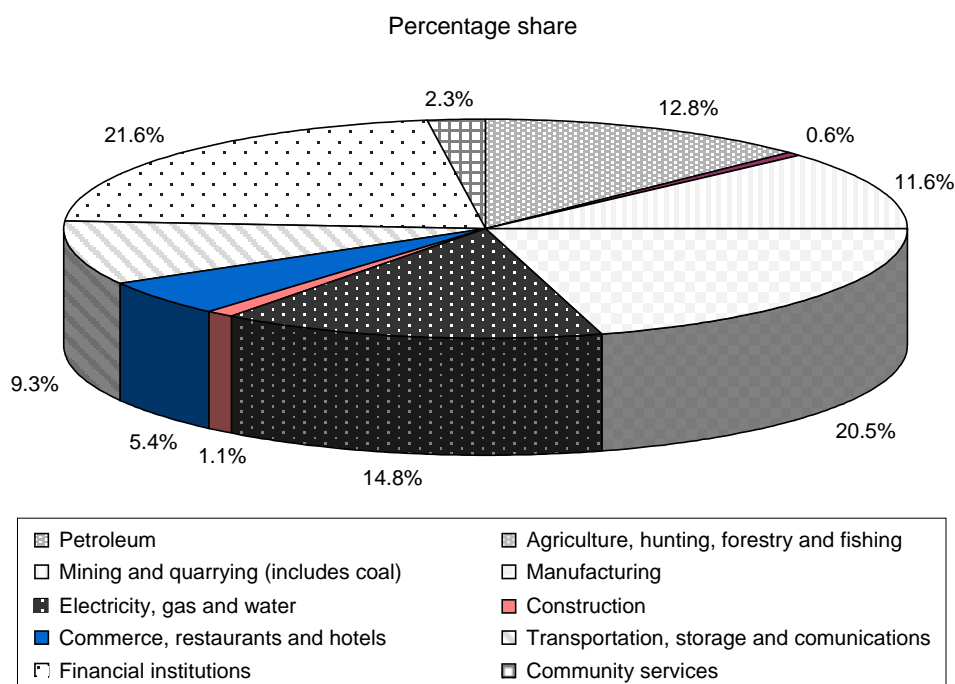
In millions of US dollars

	Change in international reserves	Current account	Capital and financial account	Public sector			Private sector				
				External debt	Change in external assets	Subtotal	Net foreign direct investment	Portfolio investment	External debt	Short-term external assets and errors and omissions	Subtotal
1990	610	544	97	-172	-46	-217	484	0	-295	124	314
1991	1,763	2,347	-420	-319	28	-291	433	5	-373	-193	-129
1992	1,274	876	348	-424	-368	-792	679	66	499	-104	1,140
1993	464	-2,221	2,199	-44	126	82	720	145	1,799	-548	2,116
1994	199	-3,674	3,393	-89	-1,162	-1,251	1,298 ¹	478	3,000	347	5,123
1995	2	-4,528	4,560	509	863	1,372	712	165	2,784	-503	3,158
1996	1,721	-4,642	6,683	1,301	-564	737	2,784 ²	292	3,909	-1,359	5,626
1997	277	-5,751	6,587	674	-287	388	4,753 ³	593	2,996	-2,701	5,640
1998	-1,390	-4,858	3,314	1,658	-71	1,588	2,033 ⁴	-265	468	-356	1,880
1999	-315	671	-555	1,485	-584	901	1,392	-27	-1,234	-2,018	-1,887
2000	870	626	-15	682	-223	459	1,973 ⁵	17	-1,011	-1,194	-215
2001	1,217	-1,251	2,390	3,061	-1,620	1,441	2,493	-41	46	-1,471	1,027
2002	138	-1,639	1,295	-1,199	1,560	361	1,171	16	-1,007	1,236	1,416
2003 ⁶	-470	-806	124	298	-238	60	872	14	-141	-468	277

¹ Includes revenues from the privatisations of: Banco de Colombia (\$326 million) and Banco Central Hipotecario (\$156 million). ² Includes revenues from the privatisation of Chivor (\$638 million), Betania (\$301 million), Banco Popular (\$274 million) and EPSA (\$132 million). ³ Includes revenues from the privatisation of: Empresa de Energía Eléctrica de Bogotá (\$2,177 million), EPSA (\$496 million) and Cerromatoso (\$166 million). ⁴ Includes revenues from the privatisation of Electrificadora de la Costa (\$511 million). ⁵ Includes revenues from the privatisation of Carbocol (\$465 million). ⁶ Preliminary data as at June 2003.

Source: Banco de la República.

Graph 1
Foreign direct investment by sector, 1990-2003



Source: Banco de la República.

For the purpose of this paper we will focus on the non-remunerated reserve requirements on capital inflows. The literature (most of which refers to Chile) emphasises the following goals of non-remunerated reserve requirements on capital inflows: (i) to generate a bias against short-term external debt in order to decrease the economy's vulnerability to negative external shocks that reduce the supply of foreign funds; (ii) to stabilise capital flows without negatively affecting long-term capital productivity; and (iii) to facilitate an increase in interest rates without generating additional upward pressure on the real exchange rate. In the first case non-remunerated reserve requirements on capital inflows are understood as a liability management instrument, and in the other two as a macroeconomic policy tool (see Villar and Rincón (2000)).

In Colombia, non-remunerated reserve requirements on capital inflows were imposed in September 1993, following Chile's previous experience. The prime motivation was to replace quantitative controls (which forbade obtaining external debt for working capital through the domestic financial sector) in place at the time with a price control (in order to match the internal interest rate with the external one). This measure was later considered a powerful tool to promote a long-term structure in private capital flows. However, at the time it was seen as a backward step from the capital account liberalisation that started in 1991.

The non-remunerated deposit requirement was initially set at 47% of the value of debt for debt maturities of 18 months or less. In the following years several modifications were made to the rate and terms. At the beginning of 1994, the minimum maturity period was extended to three years and in August, to five. In the two following years it was modified further, taking into account the behaviour of capital flows, the internal interest rate and devaluation expectations. In May 1997 a single reserve requirement that applied to all debt was adopted, and subsequently reduced to reach a value of zero in May 2000. With the reserve requirement at zero, the restrictions on short-term indebtedness were eliminated in practice but the mechanism remained available for future use.

The control has been evaluated by a number of authors, using different methodologies and considering different time horizons. All the studies reach the same conclusion: the non-remunerated reserve requirement lengthened the maturity structure of external debt.

Table 2 shows the composition of private external debt according to the term structure. Three periods are clearly defined. In the first period (1990-93) the private sector external debt level was low and

about 55% was short-term. In the second period (1994-98) the private sector external debt grew quickly and concentrated on the medium and long term. The ratio of medium- and long-term debt to short-term debt was about four to one. In the third period (1999-2002) the private sector external debt fell and the share of short-term debt rose. This trend was accentuated in 2003 according to data for the first half of the year. The period of strongly increasing mid- and long-term debt coincided with the years of strong private sector indebtedness to pay for the privatisation of public assets. Even though these medium- and long-term debts would have been acquired anyway, the impact of reserve requirements on the term structure of private debt is evident.

Ocampo and Tovar (1999) use formal methods to evaluate the effect of non-remunerated reserve requirements on the term structure of external borrowing. Their results suggest that the term structure of private capital flows is determined not only by the relative cost of debts but also by the exemption regime for debts with a minimum maturity. On this basis they conclude that a flat tax on all debts, although easier to administer, is not a perfect substitute for the system in place between September 1993 and May 1997, which imposed reserve requirements on debts with a certain minimum maturity.

Estimates of the impact of the reserve requirement on the volume of capital inflows vary significantly. Cárdenas and Barrera (1997) use regression analysis, with data for 1985-95, and conclude that the non-remunerated reserve requirement for external debt was not effective in reducing capital flows. However, as noted by Ocampo and Tovar (1999), the analysis is erroneous, since it does not take into account that the non-remunerated reserve requirement for external debt replaced an administrative form of capital control. To avoid this problem, the authors begin the sample period for their econometric analysis in 1993, the year in which the administrative controls were eliminated. They conclude that the reserve requirement on external debt was, in fact, effective, not only because it generated an increase in the cost of short-term debt, but also due to imperfect substitution between debts of different maturity. Rincón (1999) and Rocha and Mesa (1998) reach the same conclusions.

Villar and Rincón (2000) criticise earlier research for not addressing the problem of simultaneity that arises because capital controls influence interest rates, which in turn affect capital inflows. Thus, the papers cited earlier, "... obtain a partial equilibrium result: given the differential between domestic and foreign interest rates, a tax on capital inflows reduces the volume of those capital inflows. The tax, however, should increase the domestic interest rate and it is likely that its total effect on the volume of capital inflows will be ambiguous when this channel is taken into account". The authors present a simple model that relates the real interest rate and the real exchange rate and estimate it over 1993-99. They conclude that the reserve requirement for external debt allowed for an increase in interest rates and lowered the growth of aggregate demand without generating additional real exchange rate appreciation pressures. In their words, price-based regulation on capital flows is "... an effective and a useful tool for macroeconomic policy which should be used in periods of large capital inflows to an economy with excess aggregate demand. Nevertheless, it is not a tool that should be kept as a permanent liability policy" (p 55).

The mainstream view in Colombia on the effects of price controls on capital inflows is in line with the conclusions of Villar and Rincón (2000) and Ocampo and Tovar (1999). In their view, this kind of control improves the term structure of external debt, decreases capital inflows (Ocampo and Tovar) and makes it easier for authorities to increase the interest rate in order to control expenditure without creating an appreciation of the real exchange rate. However, a number of disadvantages are also cited:

- The unwarranted protection to the domestic financial system resulted in wider intermediation margins;
- The capital control increased the difference between internal and external returns, perpetuating the need for the control (Suescún (1995));
- The control segmented the credit market. A few agents (the more sophisticated ones) obtained financing at (lower) foreign interest rates while the rest had to endure very high domestic interest rates;
- Although the control resulted in a low proportion of short-term to total external debt, it is not clear that it decreased external vulnerability. Colombia, along with Chile, still experienced the harsh effects of the sudden stop in capital inflows in 1998-99. With the external shock of 1997-98, the private sector stopped borrowing abroad, prepaid some of the outstanding stock, and hedged for foreign exchange risk. The capital control did not prevent any of these developments;

Table 2
Private sector external debt stock

Figures do not include leasing
 In millions of US dollars

Year/quarter	Financial sector			Non-financial sector			Total		Total stock
	Short-term	Long-term	Subtotal	Short-term	Long-term	Subtotal	Short-term	Long-term	
1990	640	...	640	768	1,113	1,881	1,408	1,113	2,521
1991	443	...	443	741	981	1,722	1,184	981	2,165
1992	890	...	890	721	1,250	1,971	1,611	1,250	2,861
1993	1,619	...	1,619	968	2,046	3,015	2,587	2,046	4,634
1994	2,301	...	2,301	912	3,981	4,893	3,213	3,981	7,194
1995	2,654	...	2,654	1,266	5,598	6,864	3,920	5,598	9,519
1996	1,620	1,725	3,346	1,530	8,304	9,834	3,151	10,029	13,180
1997	1,893	2,190	4,083	1,543	9,992	11,535	3,436	12,182	15,618
1998	1,393	1,835	3,228	1,609	10,443	12,053	3,002	12,278	15,281
1999	720	1,189	1,909	1,547	10,251	11,798	2,267	11,440	13,707
2000	743	717	1,460	1,572	9,772	11,344	2,315	10,489	12,804
2001 (Provisional data)	861	433	1,294	1,869	9,898	11,767	2,730	10,331	13,061
2002 (Provisional data)	917	217	1,134	2,146	8,928	11,074	3,062	9,145	12,208
2003 ¹ (Preliminary data)	856	149	1,005	2,830	8,377	11,207	3,686	8,526	12,212

¹ End-June.

Source: Banco de la República.

- The extensive use of the capital control reduced its effectiveness. The strong surge of foreign direct investment in Colombia suggests that the control was being avoided through this channel (among others);
- It is not clear that the capital control reduced foreign capital inflows (see, for instance, Villar and Rincón (2002)). But even if we accept that it did reduce external credit, it is not clear that internal credit did not grow to compensate. In any case, if total credit decreased, it is not clear that this helped to substantially increase saving levels. Doubts about this latter effect come not only from studies of credit restrictions in Colombia but also from the behaviour of private savings; as a percentage of GDP, such savings fell by almost 50% between 1992 and 1998;
- The illusion that the capital control was going to reduce private expenditure may have contributed to a surge in public expenditure between 1993 and 1998;
- The deposit seems to have increased the costs of hedging and therefore hindered the development of a derivatives market for the exchange rate (Banco de la República (2000)).

3. Foreign exchange market intervention

The central bank of Colombia adopted inflation targeting with a floating exchange rate in October 1999, after abandoning the crawling exchange rate band system in place since 1994. In November 1999 the central bank announced a foreign exchange market intervention mechanism aimed at accumulating foreign reserves and controlling the volatility of the exchange rate. Two years later it announced an intervention scheme designed to reduce foreign reserves.

The main characteristic of Colombia's foreign currency market intervention is its transparency and exclusive reliance on an option-based auction system. The intervention is carried out in an open manner and with rules that are public knowledge. Furthermore, the Treasury is treated in the same way as any other market agent.

The objectives of intervention are to:

- Avoid excessive movements of the nominal exchange rate in a manner consistent with achieving the inflation target;
- Strengthen the international liquidity position of the country by accumulating foreign reserves without compromising the achievement of the quantitative target for inflation or causing the exchange rate to deviate from its fundamental values;
- Moderate excessive and abrupt movements in the exchange rate from its recent trend (20-day moving average). Those movements can generate expectations of appreciation or depreciation that can result in a significant deviation of the exchange rate from its fundamentals.

By law, the Board of Governors of the central bank is directly responsible for exchange rate policy. However, the Finance Minister is one of the seven members of the Board, so the government participates in the intervention decision. The central bank executes the intervention in an independent manner.

The central bank has four types of options, two to accumulate or sell international reserves and two to dampen excessive exchange rate volatility. Agents have access to these options only through auctions held by the central bank.

- *Put (call) options for accumulating (selling) international reserves.* These options give the holder the right to sell (buy) foreign exchange to (from) the central bank. The amount of the options to be auctioned is set by the Board at its own discretion. The options are valid between the first and the last working day of the month immediately following the day of the auction (these have usually coincided with calendar months) or in the period specified in the announcement. The options can be exercised, partially or totally, during this period, as long as the condition for exercise is in place. The condition for the put (call) option is that the representative market exchange rate (TRM, certified by the Banking Superintendency) be below (above) its 20 working day (arithmetic) moving average. The strike price of the option

is the TRM of the exercise day. In the event that the options are totally exercised before their expiration date, the Board can announce new auctions.

- *Put (call) options for controlling volatility in the exchange rate.* Auctions of these options can be held by the central bank the same day that the nominal exchange rate (TRM) is 4% or more below (above) its last 20 working day moving average. This condition also applies for the exercise of the option. The amount of the auction is set by the Board at its own discretion (it is currently set at \$180 million). The strike price of the option is the market exchange rate (TRM) of the exercise day. The options expire one month after the day of the auction. The central bank can call a new auction whenever the exercise condition is met (even if the options auctioned have not expired). The amount of these new volatility options is announced at the same time the auctions are called.

Dutch auctions are used for all interventions through options. Premiums are ordered from the highest to the lowest. Bids equal to or higher than the premium at which the amount offered is covered are granted at this premium. Each participant may include up to five bids with the restriction that, in aggregate, these may not exceed the total offered amount. The institutions that are allowed to participate in the auctions include the Treasury and the “foreign exchange market intermediaries”, the latter excluding brokers and retail currency exchange houses (*bureaux de change*). On some occasions the Board announces auctions for put options to accumulate foreign reserves months in advance.

Table 3 shows the frequency of intervention. As can be seen, auctions of put options are the most frequently used mechanism. In fact, during the period between November 1999 and September 2002, Banco de la República performed monthly auctions with amounts to be accumulated that ranged from \$30 million to \$200 million. Auctions for call options to sell foreign reserves were performed only during March, April and May 2003, with an offered amount of \$200 million each month. In addition, the volatility control mechanism through call option auctions was activated automatically three times - in July, August and October 2002 for an amount of \$180 million each time.

The use of public auctions of options enhances the visibility and openness of the foreign exchange intervention mechanisms for markets while giving the central bank the discretion to choose the timing and amount of foreign reserve adjustments. These decisions are usually taken at the monthly meeting where the Board analyses the inflation report. In auctions for volatility control, the central bank's discretion is limited to fixing ex ante the amount offered per auction and the tolerated deviation of the exchange rate from its 20-day moving average. After these parameters have been set, the auctioned call and put options to control foreign exchange volatility are triggered automatically.

Banco de la República also has the discretion to announce the amounts awarded in the auctions. In all cases, the intervention amount is announced to the public the same day as the option is executed by any of its holders. No entity or individual outside the central bank is supposed to have access to privileged information. Only two types of information are not disclosed: the name of the institution that exercised the option and the nature of the intervention (whether or not it has been sterilised). However, information on the level of reserves and the monetary base is published weekly on the central bank's website with a delay of eight days. This allows market participants to infer the amount and nature of the intervention. Afterwards, information on whether the intervention was sterilised is revealed. Recent interventions have all been sterilised.

The objectives of the foreign exchange intervention have largely been achieved, in particular those set for the put and call options to accumulate or sell foreign reserves. As can be seen in Table 3, nearly \$1.4 billion in reserves have been bought since auctions for put options were introduced. This mechanism and the returns obtained in our investments have allowed Colombia to increase its foreign reserve level substantially, after the reduction that came with the defence of the currency band in 1998 and the first three quarters of 1999. At no point have the central bank or the markets deemed that this reserve accumulation could jeopardise the achievement of the inflation target.

The intervention mechanism has been designed so that it does not target any specific level of the exchange rate. The central bank buys dollars at the official exchange rate determined by market transactions of the day before. The amounts offered in these auctions have been below one third of the average daily turnover, except for the first time they were offered. The options have a one-month maturity and can only be exercised when the exchange rate falls below its 20-day moving average. With all these features, the exchange rate can appreciate substantially in periods in which the options are operating.

Table 3
Foreign exchange market intervention
In millions of US dollars

Month	Put options to accumulate reserves		Call options to sell reserves		Call volatility options	
	Auction amount	Auction exercises	Auction amount	Auction exercises	Auction amount	Auction exercises
1999						
November	200.0	200.0	.	.	.	.
December	80.0	.	.	.	.	.
Total	280.0	200.0	.	.	.	.
2000						
January	80.0	12.0	.	.	.	.
February	80.0	.	.	.	.	.
March	100.0	74.0	.	.	.	.
April	55.0	.	.	.	.	.
May	100.0	.	.	.	.	.
June	100.0	15.5	.	.	.	.
July	100.0	.	.	.	.	.
August	99.9	17.1	.	.	.	.
September	100.0	100.0	.	.	.	.
October	100.0	100.0	.	.	.	.
November	100.0	.	.	.	.	.
December	100.0	80.0	.	.	.	.
Total	1,114.9	398.6	.	.	.	.
2001						
January	75.0	69.3	.	.	.	.
February	50.0	.	.	.	.	.
March	50.0	.	.	.	.	.
April	30.0	30.0	.	.	.	.
May	30.0	30.0	.	.	.	.
June	30.0	30.0	.	.	.	.
July	30.0	30.0	.	.	.	.
August	80.0	.	.	.	.	.
September	100.0	100.0	.	.	.	.
October	140.0	140.0	.	.	.	.
November	119.9	119.9	.	.	.	.
December	50.0	50.0	.	.	.	.
Total	784.9	599.2	.	.	.	.
2002						
January	49.9	1.5	.	.	.	.
February	50.0	50.0	.	.	.	.
March	100.0	100.0	.	.	.	.
April	100.0	.	.	.	.	.
May	100.0	.	.	.	.	.
June	100.0	.	.	.	.	.
July	50.0	.	.	.	180.0	180.0
August	50.0	.	.	.	180.0	109.5
September	50.0	50.0	.	.	.	.
October	.	.	.	.	180.0	124.5
November	.	.	.	.	.	.
December	50.0	.	.	.	.	.
Total	699.9	201.5	.	.	540.0	414.0

Table 3 (cont)
Foreign exchange market intervention
In millions of US dollars

Month	Put options to accumulate reserves		Call options to sell reserves		Call volatility options	
	Auction amount	Auction exercises	Auction amount	Auction exercises	Auction amount	Auction exercises
2003						
January	.	.	.	.	.	.
February	.	.	.	.	.	.
March	.	.	200.0	144.7	.	.
April	.	.	200.0	.	.	.
May	.	.	199.9	199.9	.	.
June	.	.	.	.	.	.
July	50.0	.	.	.	.	.
Total	50.0	.	599.9	344.6	.	.
Accumulated total	2,929.7	1,399.3	599.9	344.6	540.0	414.0

The call options for selling foreign reserves have also been successful. The first auction was announced in February 2003, when the annual depreciation of the peso went beyond 25% and inflation expectations were beginning to deviate from the inflation target set by the central bank. Another two auctions were carried out to sell options for the months of April and May. In each monthly auction a total of \$200 million in call options was offered, for a total of \$600 million, of which \$344 million were exercised.

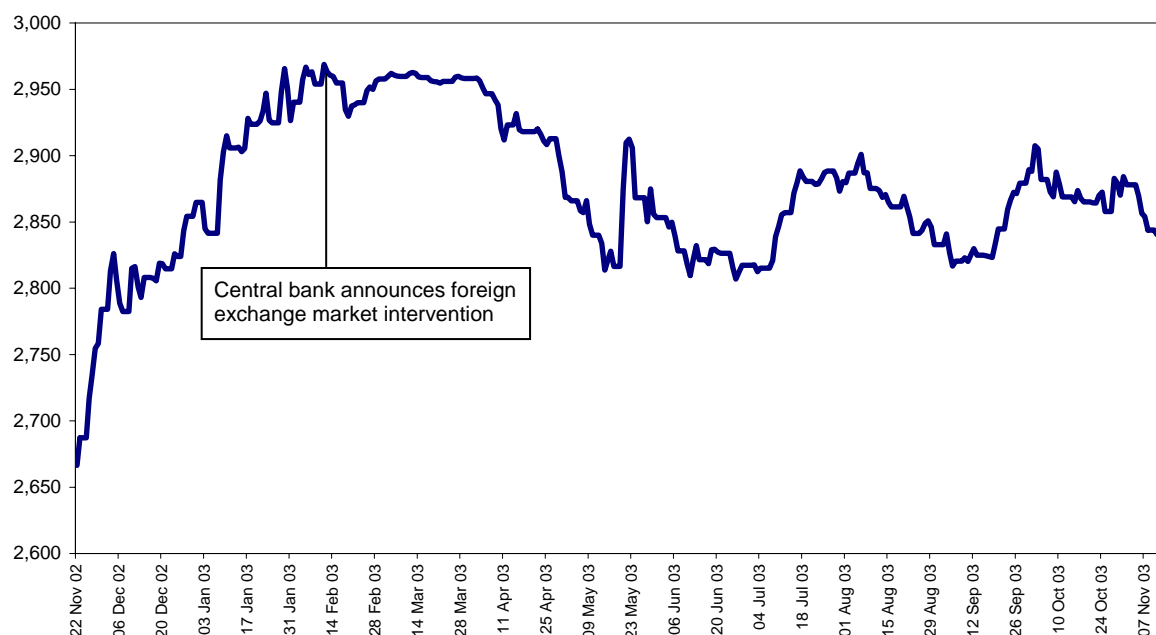
As can be seen in Graph 2, the nominal exchange rate stabilised immediately after the announcement of the auction in mid-February and then began to appreciate slowly. With a stable exchange rate and with food prices falling, inflation and inflation expectations levelled out and then started to fall. In view of this behaviour, the Board suspended the call options in June. At the time of writing, total inflation at the end of 2003 was due to be near the upper limit of the target range (5-6%). All of this was achieved in a year in which the value added tax on some products was increased and during which there was a large increase in utility and gas prices.

The auction for foreign reserve deployment was announced in February jointly with the decision of the Board of Governors to sell up to \$1,000 million through this mechanism. These announcements came after a 100 basis point hike in the central bank's interest rate and were followed by another of the same magnitude. Intervention in the foreign currency market continued as described above and it led subsequent changes in monetary policy. The foreign exchange intervention served as a complement to, not as a substitute for, the monetary policy tools of the central bank.

Table 4 shows the representative exchange rate (TRM), its deviation from its 20-day moving average during July and August 2002, when the central bank auctioned volatility options. As can be seen in the table, the exchange rate did not deviate more than 4.3% from its moving average, had appreciated 0.5% six days after the second volatility option was exercised, and remained within 2.5% of its moving average weeks later. A similar phenomenon is observed for October.

The central bank's volatility options prevented abrupt and excessive deviations of the exchange rate. In that sense, they achieved the purpose for which they were designed. Nevertheless, there are doubts about the efficiency of the mechanism (it can be very expensive if there is a strong devaluation of the peso) and whether it should or could be replaced by the options to accumulate and sell reserves.

Graph 2
Nominal exchange rate
 Pesos/\$



Source: Banco de la República.

The Colombian experience with option-based exchange market intervention so far has been very successful. For example, with these options it was possible to accumulate close to \$1,400 million in reserves without compromising the inflation target or affecting the trend of the exchange rate. Also, the options to sell reserves have been an important support for the implementation of monetary policy and the credibility of the local currency. The intervention was completely sterilised. Therefore, it was probably successful because of its signalling effects. It is not clear from Graph 2 that the simple announcement of option auctions was enough. The threat of massive intervention and the subsequent response of monetary policy were crucial success factors. The threat was also supported by the effective intervention in the exchange rate market and a credible level of foreign reserves.

Table 4
Call volatility option (2002)

Date	Exchange rate	Exchange rate (TRM) Deviation from its moving average (%)	Auction amount (\$ m)	Option exercised (\$ m)
2 July	2,398.80	1.5	.	.
3 July	2,410.50	1.8	.	.
4 July	2,425.40	2.2	.	.
5 July	2,426.40	2.0	.	.
8 July	2,434.30	2.1	.	.
9 July	2,457.40	2.8	.	.
10 July	2,462.20	2.8	.	.
11 July	2,482.20	3.3	.	.
12 July	2,506.80	4.0	.	.
15 July	2,514.00	3.9	.	.
16 July	2,507.20	3.4	.	.
17 July	2,499.90	2.8	.	.
18 July	2,524.80	3.5	.	.
19 July	2,538.50	3.8	.	.
22 July	2,529.60	3.1	.	.
23 July	2,517.40	2.3	.	.
24 July	2,539.00	2.9	.	.
25 July	2,572.40	3.9	.	.
26 July	2,580.20	3.8	.	.
29 July	2,596.30	4.0	180	117
30 July	2,599.60	3.7	.	.
31 July	2,625.10	4.3	.	63
1 August	2,636.30	4.3	180	69
2 August	2,640.40	4.0	.	17
5 August	2,643.00	3.7	.	.
6 August	2,663.80	4.1	.	23.5
8 August	2,670.60	3.9	.	.
9 August	2,649.30	2.8	.	.
12 August	2,568.80	-0.5	.	.
13 August	2,595.80	0.4	.	.
14 August	2,658.00	2.5	.	.
15 August	2,635.90	1.4	.	.
16 August	2,648.80	1.7	.	.
20 August	2,663.60	2.0	.	.
21 August	2,620.90	0.2	.	.
22 August	2,626.20	0.2	.	.
23 August	2,653.00	1.0	.	.
26 August	2,643.40	0.5	.	.
27 August	2,653.30	0.7	.	.
28 August	2,672.30	1.3	.	.
29 August	2,688.60	1.7	.	.
30 August	2,712.50	2.5	.	.

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Conducting monetary policy in a small open economy under globalised capital markets: the experience of the Czech Republic

Jirí Böhm and Vladimír Ždárský¹

1. Introduction

Price developments in small open economies are often significantly influenced by factors beyond the reach of monetary policy. These factors include food and energy prices, and capital flows, which can have a large impact on the exchange rate. Transition economies which have achieved macroeconomic stability, and liberalised capital flows and financial markets, have usually faced increased inflows of FDI (as they transform from extensive state ownership to private ownership), and to a lesser extent debt capital (as their nominal interest rates are higher than in the advanced economies). These inflows pose a dilemma. On the one hand, they enable faster development and integration with the advanced economies. On the other hand, they lead to strong appreciation pressures which, while contributing to disinflation pressures in the short run, may lead to a loss of competitiveness, growing external imbalance and, ultimately, depreciation and higher inflation.

Given the large impact of exchange rate fluctuations in small open economies, a fixed exchange rate regime was traditionally thought to be appropriate. However, liberalisation and globalisation have rendered fixed exchange rate regimes vulnerable to speculative pressures, which may make them very costly to sustain. For this reason, many countries now employ more flexible exchange rate regimes.

Where capital inflows are predominantly equity rather than debt, they may be fairly insensitive to interest rate fluctuations. Central banks therefore often intervene in the foreign exchange market to affect exchange rate fluctuations. However, as doubts exist as to the long-term effects of such interventions, central banks also apply non-standard instruments, such as the “privatisation account” in the Czech Republic.

The rest of this paper describes in more detail how globalisation and capital inflows have influenced monetary policy in the Czech Republic. Sections 2 and 3 summarise experiences in periods of strong debt and equity inflows respectively. The fourth section deals with a package of measures used by the Czech National Bank (CNB), following an agreement with the government, to curb the subsequent appreciation pressures. Section 5 looks ahead to the interaction of capital flows, the exchange rate and monetary policy following the accession of the Czech Republic to the euro area. Section 6 concludes with a summary of the CNB’s experiences of managing monetary policy in the face of strong capital inflows.

2. The CNB’s monetary policy during strong debt capital inflows

The CNB and its predecessor were aware of the significant influence of the exchange rate on prices in a small open economy, and therefore used a fixed exchange rate as the nominal anchor from the beginning of the reform period (January 1991). Selection of a reliable nominal anchor was especially important given the massive price liberalisation and the transitional nature of the Czech economy, which foreboded many internal shocks. In addition to the exchange rate, there was targeting of monetary aggregates (first the total volume of credit and soon after the M2 money supply). The strategy of targeting two, potentially controversial, nominal variables proved effective initially as capital inflows were not excessive. As macroeconomic stabilisation gradually dispelled the distrust of foreign

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investors and financial markets became less regulated and more liquid, from the second half of 1994, capital inflows strengthened and it became increasingly difficult to achieve the dual targets.

As Table 1 shows, initially (until 1996) private debt capital inflows were prevalent, benefiting from the positive interest rate differential and the low exchange rate risk in the fixed exchange rate regime. Larger and well-established domestic corporations and foreign-owned companies acquired cheaper credit directly abroad, while smaller and less known companies turned to domestic banks for credit. Domestic banks drew money from abroad and lent it to these companies. The attractiveness of Czech koruna investment also increased foreign investment in the money market and, to a lesser degree, also capital market instruments. The inflow of capacity-creating FDI grew at a markedly slower rate in this period, partly due to the absence of investment incentives. There were only relatively minor sales of state property to foreign concerns, apart from the privatisation of when SPT Telecom in 1995. The inflow of capital into the stock market trended down over time due to the poor transparency and lack of credibility.

Table 1
**Long-term structure of capital
inflows to the Czech Republic**
In billions of CZK

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Total	88	97	218	114	34	94	107	191	173	367
Foreign direct investment	16	22	67	35	41	116	216	191	208	296
Sales of state property	9	4	37	1	1	4	40	35	61	126
Reinvested profits						6	24	37	58	89
Equities	26	13	24	15	14	39	-45	-20	37	-17
Debt capital	46	63	127	64	-20	-60	-65	21	-72	88
State institutions	1	-2	-6	-16	-4	-11	-2	-7	11	29

The inflow of capital enabled a faster move to convertibility of the Czech koruna: initially internally,² and in 1995 externally, for operations on the balance of payments current account and some operations on the financial account. These steps, as well as the growing current account deficit, absorbed part of the capital inflows. But as they increased even further, the CNB had to withdraw the surplus foreign exchange from the market in order to keep the exchange rate within the narrow fluctuation band ($\pm 0.5\%$). In doing this, however, it issued new korunas, which had to be sterilised later, so that it could fulfil the M2 target.³ This sterilisation in turn pushed up interest rates, which stimulated additional debt capital inflow that had to be withdrawn from the market ... and the whole cycle started again. Monetary policy based on the targeting of two nominal variables in conditions of mostly liberalised capital flows was falling deeper and deeper into the sterilisation trap, leaving less and less space for managing the accelerating domestic demand. Indeed, the two intermediate targets were eroding the effectiveness of monetary policy. (By contrast, the implementation of monetary policy has been broadly consistent with the approach employed by most advanced central banks; Box 1.)

² An important step was the gradual deregulation of access by individuals to foreign exchange. The annual limit for purchases of foreign exchange by individuals was increased, gradually at first, and then, from 1995, radically (from CZK 12,000 to CZK 100,000). Eventually, after the introduction of internal convertibility for operations on the current account, it was completely abolished.

³ M2 growth was increasingly influenced by foreign money creation (the share of net foreign assets in the growth of money supply grew from 45% in 1993 to 80% in the last quarter of 1995), as well as by the domestic credit issuance generated by surplus liquidity in the banking sector and the related willingness of banks to also grant credits for less credible projects.

The CNB tried to neutralise part of the capital inflows by prepaying all loans from the IMF, having the government transfer privatisation proceeds from commercial banks to it, shifting from clearing to a convertible-currency payment system with Slovakia, introducing more stringent rules for foreign exchange transactions with its clients and, for a time, limiting short-term open positions of banks with non-residents.⁴ Also considered at this time, and allowed for in the new Foreign Exchange Act, was requiring a proportion of funds borrowed from abroad to be placed in an interest-free account with the CNB. However, as this idea was not supported by the OECD or other international institutions, it was not introduced. The CNB also tried to slow the money supply, without pushing up interest rates, by increasing required reserve ratios, but this strategy was limited by concerns about the impact of this implicit taxation of the financial performance of banks.

Box 1

Monetary policy in the Czech Republic since the mid-1990s

The CNB's monetary policy has been implemented in an environment of surplus liquidity. Regular repo tenders have been used to set broad liquidity in the banking sector. Their maturity has varied. Initially it was one to two weeks; in early 1997 one year was added, from 1998 only two weeks and three months were used, and now only two-week repos are employed. The declared repo rate, which serves as the maximum at which banks' bids can be satisfied in the tender, has been the key monetary policy rate. Fine-tuning instruments (securities and/or foreign exchange operations) have been used only rarely, to smooth the effects on interest rates of unexpected liquidity fluctuations in the market.

There were no automatic facilities in the 1990s. The CNB used, at its discretion, "emergency" and "Lombard" credit facilities to help those central banks that faced short-term liquidity problems. The emergency credit facility was withdrawn in December 1995 and the Lombard facility was converted into a marginal lending facility in May 1997. The interest rate applied to the latter, the "Lombard rate", provides a ceiling for short-term interest rates in the money market. The overnight deposit facility, introduced in December 1998, provides a corresponding floor. The spread between the Lombard and deposit rates had varied prior to 2001, as it was used to signal to the market concerns about future interest rates. Since then, the spread has been fixed at 200 basis points, with the deposit rate 100 basis points below the repo rate and the Lombard rate 100 basis points above.

The CNB has also used reserve requirements but, as in other countries, their importance has waned over time. In July 1997 the CNB started the process of aligning its own requirements with those of the ECB. The reserve ratio was therefore cut from 9.5% to 2% by 1999 and interest has been paid on required reserves since July 2001.

The CNB used to intervene regularly in the foreign exchange market. However, following the enlargement of the fluctuation band in February 1996, intervention has been used only to smooth exchange rate volatility.

Discounting of export bills and rediscounting of commercial bills were used until September 1997 to support exporters and small- or medium-sized businesses.

These measures only slightly reduced capital inflows. In February 1996, the CNB decided to fight the accelerating inflow of debt capital by widening the exchange rate fluctuation band to $\pm 7.5\%$. This increased the exchange rate risk, making the returns on koruna-denominated investments less attractive to foreign investors. Debt inflows approximately halved in 1996, but still exceeded the amount necessary for covering the current account deficit, leading to a 5.5% appreciation of the koruna (vis-à-vis the central parity of the existing currency basket: 65% DEM, 35% USD) by February 1997. The CNB intervened only sporadically, as it did not want to generate any undesirable volatility of the exchange rate amid ongoing uncertainty regarding its equilibrium level.

The appreciation accelerated disinflation (in May 1997, annual consumer price inflation fell to 6.3%), but on the other hand it reduced the competitiveness of domestic producers (both exporters and producers placing their products on the domestic market). At the same time, the demand side of the economy was overheated. Banks underestimated credit risk and lent readily despite weaknesses in

⁴ From August 1995 the excess of a bank's liabilities to non-residents with maturity of less than a year over its corresponding assets was not to exceed 30% of the sum of short-term assets and liabilities, or CZK 500 million. However, the limit was frequently circumvented. Banks lengthened the maturity of the funds drawn abroad slightly above the limit, borrowed abroad through domestic non-banks or used off-balance sheet operations, which were not subject to this limit. The limit was abolished in November 1997.

the legal environment. The two-pronged monetary policy was not able to suppress the accelerating domestic demand and other fiscal and income policies did not provide adequate support.⁵

The insufficiently flexible domestic supply could not meet the accelerating domestic demand, which, in the context of a small open and liberalised economy, resulted in a growing external imbalance. From late 1996, the current account deficit fluctuated between 8% and 9% of GDP, markedly exceeding the generally accepted critical limit (5%). The growing gross external debt was approaching the safety limit of 40% of GDP. Exports began stagnating. These trends reduced foreign exchange reserves to the safety limit of three months' coverage of imports of goods and services. There were also signs that dynamism was being lost on the microeconomic front. Privatisation of large banks was continuously postponed, price deregulation slowed down, restructuring of the corporate sector proceeded only very slowly, the capital market still lacked transparency, the exercise of ownership rights was poor, enforcement of the law was weak, and so forth. In April 1997, the government adopted measures aimed at reducing the fiscal deficit (the so-called first government package), but markets regarded them as insufficient. Against such a background, investors gradually came to believe that macroeconomic developments were unsustainable and expectations of depreciation intensified. Moreover, elements of instability in the domestic political situation and contagion from the currency crises in Southeast Asia also played a role in the emergence of exchange rate turbulence.

The concurrence of the above factors resulted in strong pressures on the Czech koruna in May 1997. In this situation, the CNB was not able to defend the fixed exchange rate effectively despite a radical interest rate increase and massive intervention in the foreign exchange market. The CNB failed to protect the fixed exchange rate, but managed to handle the attack against the Czech koruna so that, compared to the currency shocks in some other countries, it resulted in only a modest depreciation of the exchange rate (by approximately 12% against the central parity of the currency basket). The fixed exchange rate was replaced by a managed floating regime.

3. Monetary policy during a period of strong equity capital inflows

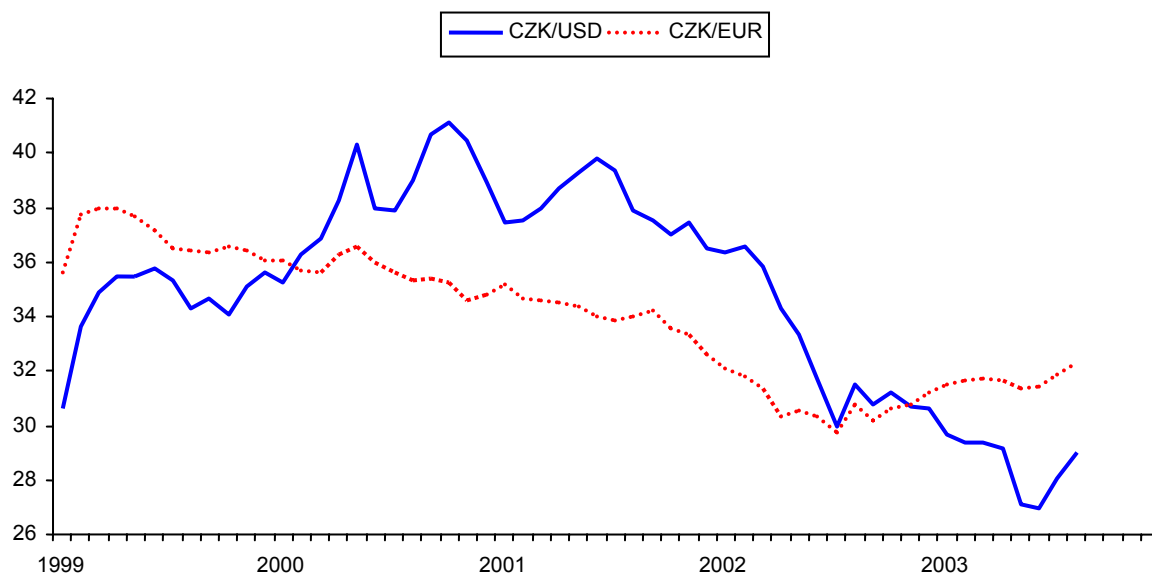
Higher inflationary expectations, coupled with the depreciation of the koruna, pushed inflation to almost 10% by August 1997 and over 13% in early 1998. While floating the currency gave more scope for an independent monetary policy, it became evident that there was no reliable relationship between the money supply and inflation. The money supply was unpredictably related to both the monetary base and inflation, and there were significant lags in the transmission mechanism. The lame results from money targeting led the CNB to switch to inflation targeting from January 1998. Inflation targeting, being more comprehensible, is more likely to anchor inflationary expectations. It can also adapt better to today's fast-changing globalised world.

The high inflation, the risk of continuing exchange rate depreciation, the persistent high inflation expectations, the more relaxed setting of macroeconomic policies, and the uncertainty regarding the early elections all hindered the pace of interest rate cuts. As a result of fiscal and monetary restrictions, together with other structural factors, economic growth faltered (GDP contracted in 1997, 1998 and the first half of 1999). From the second half of 1998 until mid-1999, inflation fell rapidly due to the suppressed domestic demand, decreasing inflation expectations and positive supply shocks (low prices of raw materials, exchange rate appreciation). Given these developments, and their impact on inflation forecasts, the CNB rapidly cut interest rates. The key monetary policy interest rate (two-week repo rate) was cut in 13 steps from 15% to 6.5% during this period. Interest rates in the second half of 1999 were reduced more gradually (the repo rate was cut in five steps to 5.25%). A significant decrease of the interest rate differential resulted (in 1997, and particularly in 1998 and 1999) in a net outflow of debt capital. Starting in 1998, however, the inflow of FDI rose sharply (see Table 1) - reflecting a unique concurrence of new investment incentives (capacity-creating FDI), privatisation of state property and sales of private property which some local owners could not keep

⁵ The public finances appeared relatively sound (a reported deficit of 1-2% of GDP), but the hidden deficit and the structural component of the deficit were growing. Moreover, according to IMF calculations, a surplus of up to 3% of GDP was required. At the same time, wages were growing far faster than productivity.

after the exchange rate turbulence. The inflow led to accelerating appreciation pressures in the second quarter of 1999 (see Graph 1).

Graph 1
Nominal exchange rate of the koruna
against the euro and US dollar since 1999



In this period, the CNB responded to the strengthening koruna by easing interest rates, in line with the forecasts of falling inflation, and attempted to dampen its excessive volatility by intervening in the foreign exchange market. These measures were accompanied by the use of the “privatisation account”, described in the following section.

4. Economic policies during increased capital inflow; the “privatisation account”

In 1999, the government sold its holding in the ČSOB bank and converted the proceeds into korunas on the foreign exchange market, leading to a substantial appreciation. In addition, it decided to accelerate privatisation of other state-held assets worth approximately USD 8-9 billion, to be completed by 2003. It was expected that the assets would be sold mostly to non-residents, which would lead to a stronger inflow of capital. Excessive capital inflow would directly stimulate the growth of domestic demand and concurrently, through the exchange rate appreciation, slow down the growth of domestic supply, possibly causing greater external imbalances. This could, especially if economic growth was slow, alarm investors, which would subsequently result in a capital outflow followed by an inevitable exchange rate depreciation. The economy would therefore be exposed, in the medium term, to the risk of higher exchange rate volatility and of a steep depreciation, with adverse consequences for prices, monetary policy and overall economic development. At the end of 1999, the CNB and the government agreed on a joint strategy; see CNB (1999).

The strategy document suggested that, given the growing domestic demand, a tighter fiscal and income policy would be necessary to avoid the CNB having to raise interest rates, which might stimulate debt capital inflows into the country, thus intensifying the appreciation trends. The monetary policy should, however, address the disequilibrium appreciation of the Czech koruna and suppress the exchange rate volatility. Aiming to reduce the appreciation pressures, the government agreed that until the end of 2000, it would refrain from issuing its bonds abroad. As non-debt capital is insensitive to interest rates, and interest rate policy was directed to the inflation target, interventions in the foreign exchange market were chosen as a means of dampening exchange rate volatility. Their effectiveness

was supposed to be supported by the “privatisation account” used for depositing foreign exchange from the large sales of state property.⁶ If these funds were drawn down, the CNB had to convert them into korunas by means of a direct purchase into its foreign exchange reserves. Keeping large foreign exchange volumes from entering the market (and moreover in waves and with irregular intervals) sought to dampen the short-term volatility of the exchange rate and assuage the strong appreciation expectations. The funds deposited in the privatisation account were to be used for repayment of debts from the transformation period (eg for consolidation and stabilisation of the banking sector), one-off transformation costs (eg the introduction of the planned new pension system) and costs related to ensuring compatibility with European Union legislation (environment, infrastructure, etc). Drawing on these funds was completely at the discretion of the government and the duty to spread it over a period of time was not included in the agreement.

Table 2
Use of the privatisation account
Billions of koruna

	2000	2001 ¹	2002
Privatised state property	35	81	125
Converted via privatisation account	20	40	125

¹ Includes CZK 20 billion from the unblocking of the Russian debt.

The privatisation account was not fully used until 2002 (Table 2).⁷ It was used for holding, and converting into korunas, only about half of the proceeds from sales of state property over the period. It therefore only assisted in suppressing appreciation pressures to a limited degree. The funds were generally in the account for several months, and the continuing appreciation of the koruna led to valuation losses. Moreover, the CNB was buying foreign exchange reserves at a higher price than if the privatisation proceeds had been sold on the market (at the markedly stronger exchange rate). The government was the real beneficiary of the privatisation account as it received more korunas for its foreign exchange.

The strategy discussed in the previous section and the privatisation account proved to be an insufficient anchor for exchange rate expectations, causing a gradual decline in the effectiveness of interventions and assisting in the creation of the appreciation bubble. Excessive appreciation of the koruna at the end of 2001 and the beginning of 2002 came at a very unfortunate time, as monetary conditions were being tightened at a time when the Czech Republic's principal trading partners (the EU states) were in recession. The growing deficit in the public finances also gave rise to concerns, and calls for the privatisation proceeds to cover some public spending at the earliest practicable time. To give a clear signal to the market that the proceeds from the state property privatisation would not in future be let onto the foreign exchange market, causing further appreciation of the koruna, the government and the CNB agreed, at the beginning of 2002, to cooperate in remedying the effects of the state's increased foreign exchange revenues on the foreign exchange market; see CNB (2002).

The approved procedure which followed up on the strategy is based on three types of measures:

- (a) *a stock-taking of all existing and potential foreign exchange commitments of the state.*
Specifically:
- the Ministry of Finance would not issue bonds denominated in foreign currency in 2002 (later extended to include 2003);

⁶ The privatisation account was not used for proceeds from less important sales of state property, municipal, corporate and private property, capacity-creating FDI and privatisation proceeds denominated in korunas.

⁷ The same was true of most other measures adopted under the strategy. The growing deficit in the public finances and the persistent pressure on the Ministry of Finance to allow government bonds to be issued abroad can be cited as examples.

- the ministries and selected state-owned institutions would, in cooperation with the Ministry of Finance and the CNB, provide for the settlement of their foreign currency commitments out of the proceeds from privatisation;
 - National Property Fund proceeds which were earmarked for the payment of costs and losses of the Czech Consolidation Agency would not be converted in the foreign exchange market;
 - foreign exchange commitments of the Czech and Moravian Development and Guarantee Bank would be given priority in conversion from Czech korunas to euros with the Czech Consolidation Agency;
 - the Czech Export Bank would provide for its prospective foreign currency asset financing by transacting with the state;
 - the Ministry of Finance would leave the funds from the unblocking of the Russian debt on the foreign exchange account with the CNB until at least 31 May 2002, and the conversion of these funds into Czech korunas would take place outside the foreign exchange market - by means of a direct purchase into the CNB's foreign exchange reserves.
- (b) *ways of influencing the course of future privatisation transactions.* It was agreed that all future negotiations with privatisation advisers and investors would be directed so that a part of the privatisation price was paid in Czech korunas using a Czech koruna-denominated loan.
- (c) *agreement that the CNB would purchase remaining privatisation revenues* (and other foreign exchange) and place them directly in its foreign exchange reserves in cases where the state was unable to leave such revenues in the foreign exchange account with the central bank and a payment in Czech korunas proved impossible to agree with the investor. To eliminate or mitigate the CNB's losses in connection with the sterilisation of these direct conversions, and to address any past unsettled relations between the government and the central bank, CZK 25 billion would be deposited in a non-interest-bearing foreign exchange account with the CNB and any remaining foreign exchange funds of the state (existing or acquired in the future) which would have to be converted into Czech korunas would be purchased directly from the state by the CNB, and added to its foreign exchange reserves. In order to partially compensate the CNB's future losses ensuing from the sterilisation of additional foreign exchange reserves, the CNB would charge the state a fee for direct conversions of foreign exchange revenues, as per an agreed schedule.⁸

The key items of the revised strategy were implemented. The privatisation account was more consistently used (Table 2). However, it took more than six months to convince markets that the government and CNB would implement the strategy in a consistent manner. The excessive appreciation trend was halted in late September 2002.

5. Future interaction of capital flows, exchange rate and monetary policy

Exchange rate movements and capital flows will have a major effect on domestic prices until the Czech Republic joins the euro area and adopts the single currency. Integration of the Czech Republic into European structures will no longer have any significant influence on "non-speculative" capital flows. Sales of state property will proceed according to the plans or needs of the government. However, due to the depletion of the state and private property for sale, future sales to non-residents are unlikely to cause the Czech koruna to appreciate. Capacity-creating FDI, as well as the inflow of capital into the stock market, will be only partially boosted by the EU accession. Inflow of capital into real estate will not be very notable. At present, these inflows are regulated by law only for non-resident

⁸ A fee of 3% applied to the first CZK 50 billion, 6% to the next CZK 50 billion and 9% thereafter. The fee schedule was reduced in 2003 and will be phased out by 2007.

individuals, and moreover, with respect to the application of the exception at a maximum permitted length {unclear}, we cannot expect the situation to change in the medium term. On the contrary, we cannot exclude that in some areas, net capital outflows may take place as has occurred with shares since 1999 (Table 1).⁹

The EU accession and the subsequent convergence process will not create very favourable conditions for debt capital inflows. The scope for making koruna investment more attractive compared to euro-denominated investment will be further narrowed by the convergence of interest rates with the euro area and by the relative stability of the exchange rate (in conditions which otherwise remain unchanged) as a result of the slower pace of its equilibrium appreciation. Competition from higher interest rates in most transition countries may also play a role. The trend of debt capital flows will be affected mostly by two phenomena. The first is the drawing on foreign resources by the public sector (by means of a growing volume of purchases of government bills and bonds by non-residents or potential issuance of government bonds abroad), which has been gradually increasing since 2001 (Table 1). The second phenomenon is the potential flows of speculative debt capital in connection with so-called convergence plays. These speculations may occur both prior to the setting of the central parity before joining ERM2 and in the period before setting the conversion rate to the euro, ie before the setting of an irrevocably fixed exchange rate which will be applied to conversions of entities' Czech koruna assets and liabilities to the euro.

The efforts to limit the risk of exchange rate fluctuations as a result of convergence plays are one of the reasons why the CNB recommends participation in the ERM2 exchange rate mechanism for no longer than the required minimum period of two years. The ERM2 exchange rate mechanism is regarded merely as the gateway for joining the euro area and a prolonged membership of the mechanism is therefore not desirable. The Czech Republic should join ERM2 only after conditions have been established which enable it to introduce the euro at the time of the assessment of the exchange rate criterion (two years after joining the ERM 2) and to then benefit from its introduction without experiencing any problems. The time limitation, however, only partly reduces the risk of convergence plays. A more important factor is the minimisation of the scope for this type of speculation through a consistent defence against disequilibrium exchange rate development. Stable macroeconomic development (the goal of all macroeconomic policies) will play a major part, together with absorption of foreign exchange inflows from the sales of the remaining (still relatively great) volume of state property and the potential inflow of debt capital drawn by the state on foreign markets to finance the public finance deficit and public debt, through the privatisation account.

Adopting the euro will significantly reduce the risk of exchange rate speculation. Potential speculation will focus only on the relation of the euro to major currencies outside the euro area. It will be the task of the ECB to counter any such speculation, although the CNB may be instructed by the ECB to assist in implementing the ECB's responses.

6. Conclusions

The CNB's experience in managing monetary policy during its relatively short history is in many ways identical to the experience of other central banks in small open economies, where the exchange rate and supply shocks significantly affect domestic prices. Unlike central banks in market economies, central banks in transition economies additionally experience problems in connection with the need for privatisation of vast state assets which, given the shortage of domestic capital, require the involvement of foreign capital on a great scale. A role is also played by the need to respond to many internal shocks, in particular in the early years of transformation, which may tempt central banks to opt for the the dual scheme of monetary policy management based on the fixed exchange rate and money supply targeting. The CNB's experience demonstrates the failure of the dual system in a period of more and more liberalised capital flows and financial markets. A monetary policy attempting to target two nominal variables by means of a single instrument (interest rate) is caught in a vicious circle and is ineffective in managing domestic demand. The declining effectiveness of monetary policy is also due

⁹ The only exception was 2001, when global stock markets recorded a significant downturn.

to insufficient support from other macroeconomic policies. The inflexible domestic supply - typical for most transition economies - is not able to meet the accelerating domestic demand, resulting in external imbalances. If this is accompanied by other negative factors, such as problems in the banking sector or contagion, exchange rate turbulence or a currency crisis is very likely.

The CNB's experience also confirms that applying administrative instruments to limit capital inflows is not very effective, partly because ways of circumventing them are quickly found. A marked widening of the fluctuation band for exchange rate movements was also not an adequate solution. The substitution of the dual scheme of monetary policy management with targeting of the fixed exchange rate (though only in the form of a crawling band) is very vulnerable in the fast-changing globalised world of today. However, resorting to one of the autonomous schemes of monetary policy management, including inflation targeting, also carries a degree of risk, as the exchange rate, owing to its continuing major effect on prices, cannot be left out of consideration.

Extraordinary shocks, such as big swings in non-debt capital or FDI inflows, call for extraordinary measures. But unless these are implemented with determination and in a credible manner, their effectiveness is relatively low. Following an agreement with the government, the CNB started to implement a set of measures aimed at suppressing the effects of capital inflows on the exchange rate (specifically the higher volatility and/or excessive appreciation of the Czech koruna). A major role was played by the privatisation account into which foreign currency acquired from large sales of state property had to be deposited. When these funds were withdrawn, the CNB was supposed to convert them into Czech korunas outside the foreign exchange market by purchasing them directly and transferring them to the foreign exchange reserves. The effectiveness of these measures increased only after their consistent application starting from 2002. However, it took more than six months before the excessive appreciation expectations were calmed.

The development of the exchange rate and the capital flows will continue to affect price developments until the Czech Republic joins the euro area. The CNB's analyses show that integration into the European structures may cause the exchange rate to fluctuate only as a result of convergence plays, namely speculations on the level of central parity within the ERM2 mechanism, and later on the conversion rate to be applied in converting Czech koruna assets and liabilities to euros. Also for this reason, the CNB, among other things, recommends participation in the ERM2 system only for the required minimum of two years. A more important challenge, however, is the prevention of a disequilibrium exchange rate development which establishes favourable conditions for convergence plays. Monetary policy and other macroeconomic policies should, first and foremost, provide for macroeconomic stability. This can be also bolstered by a consistent utilisation of the measures agreed with the government, and, within that framework, of the privatisation account. The account should absorb not only the proceeds from privatisation of the remaining state property, but also the inflow of debt capital drawn by the state institutions on foreign markets to cover the public finance deficit and the public debt.

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The recent appreciation of the Hong Kong dollar

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1. Introduction

In late September 2003 the Hong Kong dollar (HKD) appreciated unexpectedly from close to HKD 7.80 per US dollar (USD) to HKD 7.70/USD in overnight trading in New York. By way of comparison, since the Convertibility Undertaking (CU) - the rate at which the Hong Kong Monetary Authority (HKMA) sells US dollars - was set at HKD 7.80/USD in August 2000, the strongest level the exchange rate had ever reached was HKD 7.7920/USD, using end-of-day data. While the exchange rate has since fallen back to around 7.75-7.76, it remains about 0.5 percentage points stronger than in the past. This recent episode illustrates how the process of ever growing international financial integration has led to a situation where shifts in market sentiment can result in large changes in financial asset prices over a short period of time, which in turn raises important issues for the authorities. In the present case, the most important of these concerns the design of the authorities' commitment to exchange Hong Kong dollars and US dollars that underlies the currency board arrangement. Currently, the CU is one-sided in the sense that the HKMA stands ready to *sell* US dollars at 7.80, but it is not obligated to purchase them at a preannounced rate.

This paper reviews these recent exchange rate developments, in particular why they happened and the issues they raise regarding the currency board mechanism, and examines how the information contained in foreign currency option prices can be used to assess market sentiment regarding the Hong Kong dollar.

2. Recent developments

On 22 September 2003 the Hong Kong dollar appreciated abruptly to 7.70 against the US dollar in overnight trading in New York, before falling back to around 7.75. The one-year forward rate also appreciated, reaching a low of 7.67 against the US dollar in early October (Graph 1). For the most part of the fourth quarter of 2003, the spot rate remained at the strong side of the CU, trading within the range of HKD 7.75-7.76/USD in late November, while the one-year forward exchange rate was somewhat stronger. Although the appreciation was relatively small, this unusual episode of currency strengthening renewed market concerns about the authorities' commitment to, and the effectiveness of, the currency board arrangements.

The strengthening of the Hong Kong dollar appears to have been mainly due to a rebound in market sentiment, in turn driven by a sharp improvement in economic prospects. Several factors appear to have played a role here:

- First, the ending of the SARS outbreak in June 2003, which led to a bounce-back in economic activity.
- Second, a marked improvement in the economic outlook owing to a number of positive economic policy developments related to mainland China. These include the signing of the mainland and Hong Kong SAR Closer Economic Partnership Agreement (CEPA) in June 2003 and the decision by the mainland authorities to relax restrictions on mainland residents' travel to Hong Kong, which led to a sharp increase in inbound tourism. Other developments

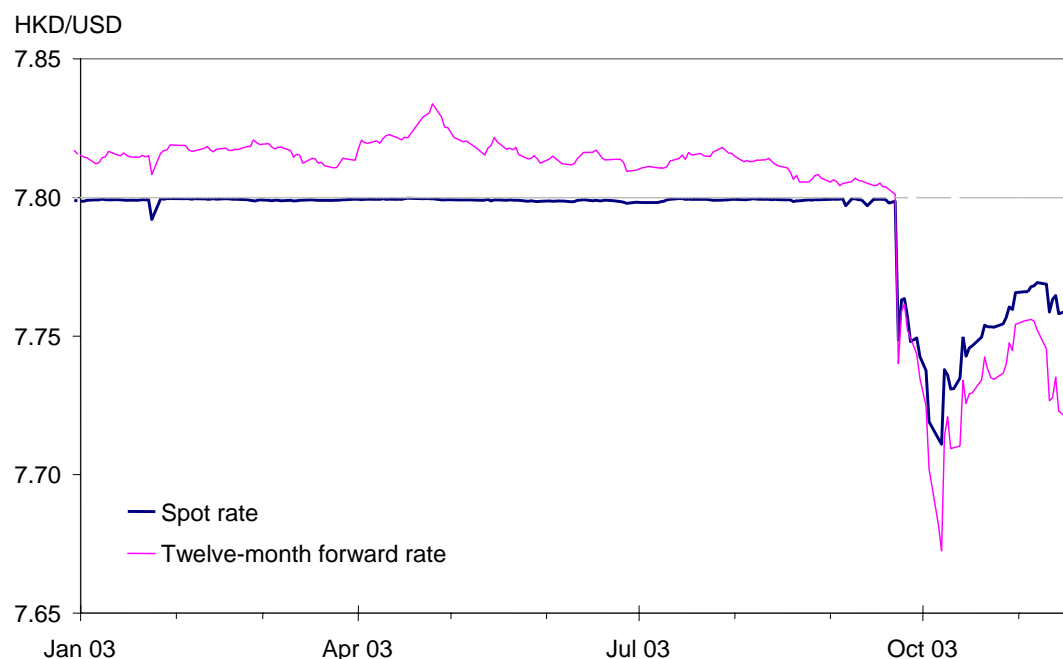
¹ Prepared by Michael Chui, Stefan Gerlach and Ip-wing Yu.

included measures allowing foreigners to immigrate to Hong Kong by investing in property and other permissible assets, and the upgrade of Hong Kong's credit rating by Moody's.

- Third, the very strong trade performance by mainland China in 2003 led to a rapid increase in Hong Kong's trade and in the demand for trade-related services.²
- Fourth, the global economic upswing, particularly in the United States and in the Asia-Pacific region, which, together with the low level of US (and therefore Hong Kong) interest rates and the depreciation of the US dollar, gave added stimulus to the Hong Kong economy.

Graph 1

HKD/USD spot and forward rates



Source: HKMA.

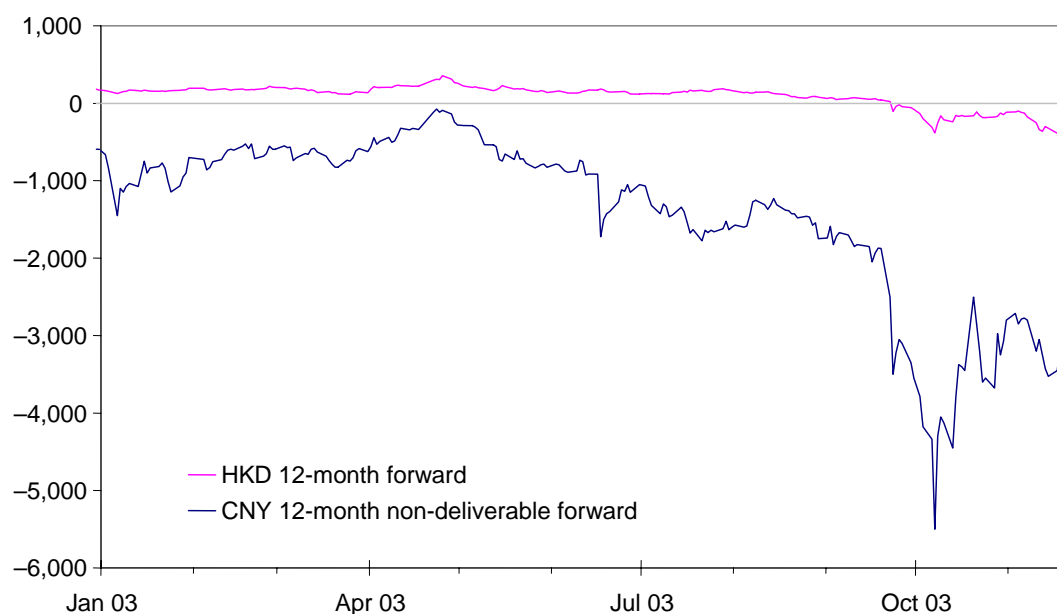
Against this background of strengthening economic fundamentals, the appreciation of the Hong Kong dollar was triggered by rising international pressure for a revaluation of the renminbi (CNY). In late 2003, officials from the G3 economies repeatedly called for the Chinese authorities to adopt a more flexible exchange rate regime to facilitate the adjustment of global imbalances. As a result, the discount of the renminbi in the non-deliverable forward (NDF) market widened markedly (Graph 2).

Given Hong Kong's growing economic integration with the mainland, some market participants apparently took the view that any appreciation of the renminbi against the US dollar could also lead to an appreciation of the Hong Kong dollar.

While these considerations may explain why the Hong Kong dollar strengthened, they do not explain the size of the initial jump. Market anecdotes attach importance to the unwinding of short positions. Over the previous two years, the Hong Kong banking sector's aggregate net US dollar open position in spot and forward markets had increased by more than 50%, to about HKD 91 billion (USD 11.7 billion) at end-August 2003 (Graph 3). As perceptions of economic prospects improved significantly, market participants hastened to unwind the large short positions accumulated previously, exacerbating the movement of the Hong Kong dollar. In sum, market sentiment and dynamics played major roles in triggering and reinforcing the recent movements in the currency.

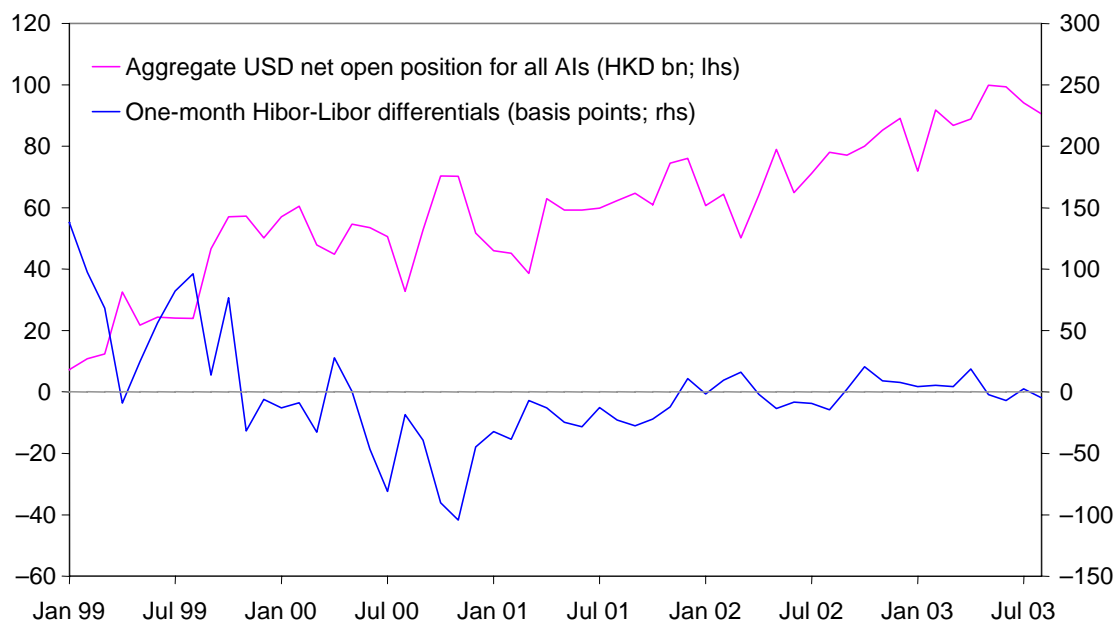
² Mainland China was Hong Kong's largest trading partner in 2002, accounting for more than 40% of total trade.

Graph 2
HKD/USD and CNY/USD forward points
 In pips



Source: HKMA.

Graph 3
Aggregate USD net open position of authorised institutions (AIs)



Source: HKMA.

3. Policy issues

Policy issues relating to this episode arise from the absence of a formal CU on the strong side of the currency board. Under the present arrangement, the HKMA sells US dollars to licensed banks when the interbank rate reaches HKD 7.80 per US dollar. By contrast, in the event that the Hong Kong dollar is under pressure to appreciate, the HKMA has no obligation to buy US dollars from the banking system at any given rate. Of course, it does so when this is considered appropriate given market conditions. For example, from 23 September to 19 November 2003 the HKMA bought some HKD 11 billion of US dollars on 11 days to dampen market volatility.

The Currency Board Subcommittee of the Exchange Fund Advisory Committee, the de facto board of the HKMA, reviewed the potential need for a CU on the strong side in 1999 and 2000. However, the arrangements had been functioning well and the Committee therefore felt that there was no need to introduce a two-sided arrangement. That said, the absence of a CU on the strong side raises the possibility that the exchange rate might appreciate sharply away from the 7.80 level as it in fact did on 22 September 2003. If this was to happen repeatedly, it could serve to undermine confidence in the currency board arrangement. The recent episode therefore brought up the issue of what would constitute the appropriate response(s).

Two options appear possible. First, the HKMA could carry out strong-side purchases of Hong Kong dollars with the goal of either preventing the exchange rate from becoming too strong, or moving it closer to 7.80. Second, a formal two-sided CU could be introduced. While a symmetric arrangement is more transparent and predictable, one aspect of the one-way CU is that it can potentially signal to those shorting the Hong Kong dollar that this is not so much of a one-sided bet. Moreover, allowing for some movement in the spot exchange rate may also be helpful for promoting the Hong Kong dollar/US dollar market.

4. Gauging market expectations using option prices

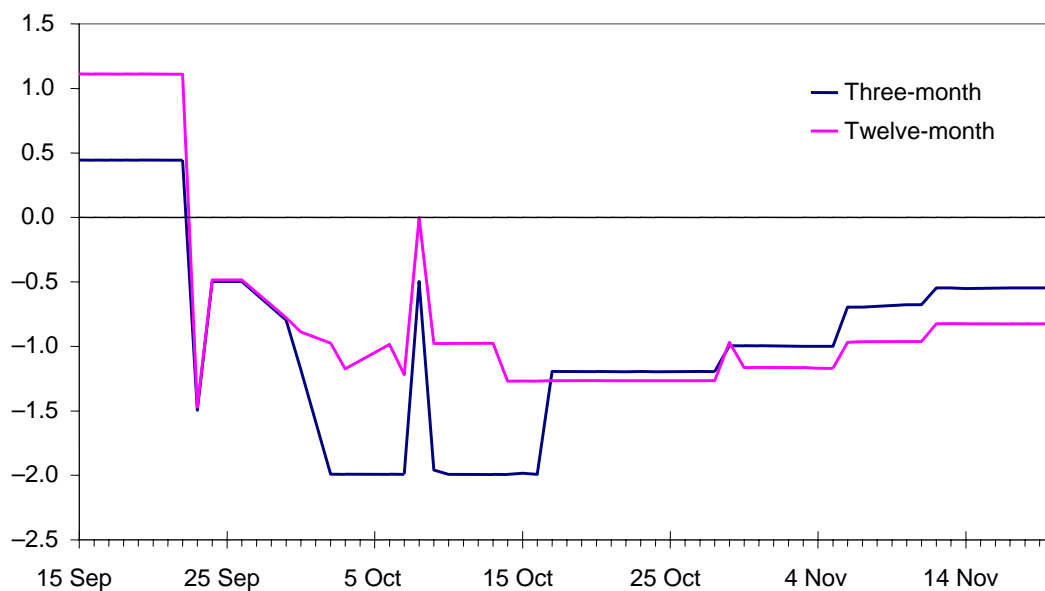
Under a currency board regime it is essential to assess market sentiment regarding the exchange rate. This has, if anything, become even more crucial as a consequence of the appreciation of the Hong Kong dollar and the fact that because of market action the exchange rate is no longer closely tied to the HKD 7.80/USD benchmark. The HKMA employs various means to gauge market expectations. Apart from monitoring the developments in the more liquid Hong Kong dollar forward and interest rate swap markets, Hong Kong dollar option prices are also used to help measure market sentiment.

A relatively straightforward way to extract information on market expectations is to examine the pricing of two option strategies: the **risk reversal** and the **strangle**. In the US dollar/Hong Kong dollar option market, a risk reversal strategy involves *buying* an “out of the money” call option and *selling* an “out of the money” put option on the US dollar. The price of the strategy, measured as the difference between the volatility of these two options, can be a useful indicator of market expectations. For example, if the market has a “balanced” view on the future of the US dollar/Hong Kong dollar exchange rate, the value of a risk reversal will be zero as the prices of both the call and put options should be the same. On the other hand, if the market holds the view that the US dollar is likely to strengthen, the call option will be more valuable than the put counterpart, resulting in a positive risk reversal value. Similarly, the price of a risk reversal will be negative if market participants are expecting a stronger Hong Kong dollar in the future. Graph 4a shows that market sentiment shifted abruptly towards a stronger Hong Kong dollar on 23 September 2003, as reflected in the negative prices of both three-month and 12-month risk reversals. The prices subsequently fell further, but recovered somewhat in mid-November.

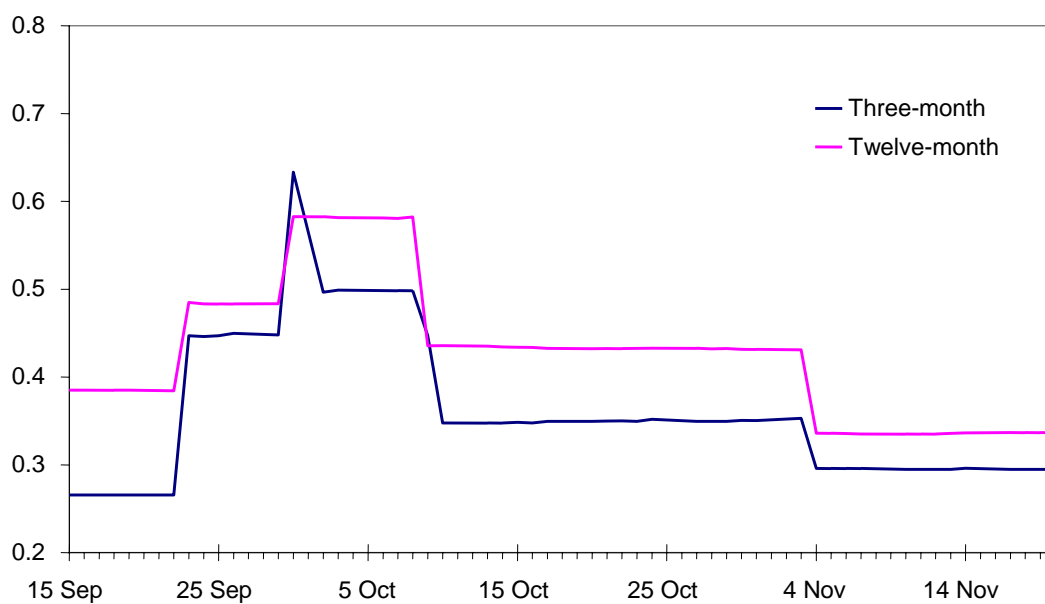
A strangle is an option strategy which involves the purchase of an “out of the money” put option and an “out of the money” call option. The return of a strangle is determined by the likelihood of an unusually large shift in the exchange rate in either direction. Therefore, an investor will use this option strategy if (s)he expects a large shift in the US dollar/Hong Kong dollar exchange rate in either direction. Graph 4b shows that prices for the three-month and 12-month strangle rose abruptly on 23 September 2003, signalling that the markets had priced in an increasing chance of an extreme movement in the Hong Kong dollar exchange rate. But since mid-November, the expectations of sharp exchange rate fluctuations have subsided somewhat, as indicated by the retreat of the strangle prices to their pre-22 September levels.

Graph 4:
Price of HKD/USD risk reversal and strangle (2003)
 In per cent

(a) Risk reversal (25-delta)



(b) Strangle (25-delta)



Source: JPMorgan Chase.

5. Conclusions

In late September 2003, the Hong Kong dollar rose abruptly against the US dollar, reflecting a sharp improvement in the outlook for the Hong Kong economy and the resulting change in market sentiment. While the appreciation remained very modest, it raised important issues regarding the operation of the currency board mechanism. This event also underscored the importance of gauging market expectations in maintaining monetary and exchange rate stability. In this paper, using US dollar/Hong Kong dollar currency option prices, we show that market participants initially became increasingly concerned about the risk of a further depreciation of the US dollar vis-à-vis the Hong Kong dollar, but this perceived risk subsided somewhat after mid-November. At the same time, the likelihood of unusually large changes in the US dollar/Hong Kong dollar exchange rate in the near future also appears to have decreased. Although the US dollar/Hong Kong dollar option market is less deep and liquid than the currency forward market, option prices offer an additional perspective in monitoring market sentiment towards the Hong Kong dollar exchange rate.

Monetary policy issues in Hungary on the eve of EU membership

Gergely Kiss¹

1. Introduction

This paper recounts the evolution of Hungarian monetary policy since the mid-1990s, paying particular attention to the recent experience with inflation targeting and a wide-band exchange rate regime resembling the exchange rate mechanism of the European monetary system, the so-called ERM II. This experience on the eve of EU membership is important because the Hungarian authorities believe that the benefits of an early adoption of the euro outweigh the possible costs. Consequently, the government, supported by the MNB, has declared that Hungary wants to join ERM II as soon as possible after EU membership in May 2004, with a view to adopting the euro in January 2008. As a result, the attention of monetary policy in Hungary is increasingly shifting to the next step of the integration process, the adoption of the euro. One can distinguish two basic strategies for the adoption process. One involves setting a date for joining EMU as quickly as possible, while the second may be considered as the “put the house in order first” strategy.

The first approach has two main arguments in its favour. First, the target date for the adoption of the euro and, by extension, for the ERM II entry exchange rate would provide an anchor for market expectations. Second, the necessity of meeting the Maastricht criteria by the target date could act as a disciplinary force for government policies. The main problem with this approach is that quick adoption of the euro may not be feasible, either because the political and social consensus is not strong enough to ensure that the Maastricht criteria will be met in the short time required, or because meeting the criteria might require very restrictive macroeconomic policies which might, in turn, delay the implementation of necessary structural reforms.

The main advantage of the second approach is that it leaves domestic policymakers greater flexibility in implementing structural reforms. Its main disadvantage is that it weakens external pressure on policymakers to implement reforms. Moreover, the strategy of putting the house in order first might increase the risks associated with the volatility of foreign capital flows.

Choosing between the two strategies is not straightforward. Each country has to make its own decision, taking into account its specific conditions. The MNB therefore prepared an analysis of costs and benefits of Hungary's euro area membership.² The study finds that Hungary satisfies many of the criteria for an optimal currency area with respect to EMU, and that it is comparable in this respect with the less developed euro area members. Thus, Hungary could live with the common monetary policy of EMU at least as comfortably as several other euro area members. Adopting the euro would have a positive impact on Hungarian economic growth through several channels, the most important one being elimination of exchange rate risk and reduced transaction costs, which would lead to increased foreign trade, lower real interest rates and greater integration of financial markets. According to estimates presented in the study, euro area membership could raise the growth rate of Hungarian GDP by 0.6-0.9 percentage points per year in the long run.

2. The crawling peg, 1995-2001

In March 1995, following a period of increasing external and internal imbalances, Hungary adopted a preannounced crawling peg exchange rate regime. Monetary policy operated within a narrow ($\pm 2.25\%$)

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² See Csajbók and Csermely (2002).

exchange rate band by progressively decreasing the rate of monthly crawl from 1.9% in March 1995 to 0.2% by April 2001. The interest rate was also progressively reduced. This policy proved to be successful, with the inflation rate dropping from 31% in June 1995 to 10.3% by the end of 1998 and competitiveness improving. By 1997 the regime had gained credibility and capital inflows had pushed the exchange rate to the strong edge of the band, necessitating sterilisation by the central bank. The MNB used various instruments to mop up excess liquidity, while keeping in place capital controls to discourage short-term capital inflows. The exchange rate regime performed well in the face of shocks to emerging markets such as the Asian and Russian crises.

While this monetary policy framework helped bring inflation down to single digit levels, it proved to be inappropriate for further disinflation. Even as the rate of crawl decreased from 0.6% to 0.2% per month between 1999 and 2001, the inflation rate stayed in the range of 9-11%. There was no more room for monetary tightening as the yearly rate of crawl, at less than 3%, was already negligible. There was increasing concern that inflationary inertia could set in. The cost of sterilisation also placed an increasing burden on the budget.

3. Inflation targeting, 2001-02

In May 2001, the MNB and the government decided to widen the exchange rate band to $\pm 15\%$ and adopt an inflation targeting (IT) regime. This move was followed in June 2001 by the elimination of the remaining exchange rate controls to facilitate hedging against the increased exchange rate risk. The adoption of inflation targeting also meant a new nominal anchor for monetary policy. While the previous monetary regime was anchored to the exchange rate, in the IT regime the inflation targets themselves became the new anchor. Soon after the announcement of the new regime, the MNB, together with the government, determined the inflation targets for end-2001 and 2002 (7% and 4.5%, respectively). The inflation targeting framework was designed to tolerate a $\pm 1\%$ deviation from the central target, which was set in terms of headline CPI for at least six quarters ahead. The MNB subsequently started to issue a *Quarterly Report on Inflation*.

As was expected, the forint started to appreciate significantly against the euro following the widening of the exchange rate band. Within the new framework, the appreciating exchange rate was expected to lead to disinflation. The economy had got used to a very rapid pass-through during the years of the crawling band. It was, however, uncertain how this would change in the new regime. The main issues were whether switching the expectations anchor from preannounced crawl to inflation targets would work, and how strong the pass-through might become when market participants experienced a continuously appreciating currency after years of gradual depreciation.

In the first years of the new regime the targets for disinflation were met. By December 2001, inflation had dropped to 6.8% (from 10.8% in May), just below the target of 7% (Graph 1). It has to be noted, however, that external factors (declines in oil and food prices) also played a significant role in the disinflation.

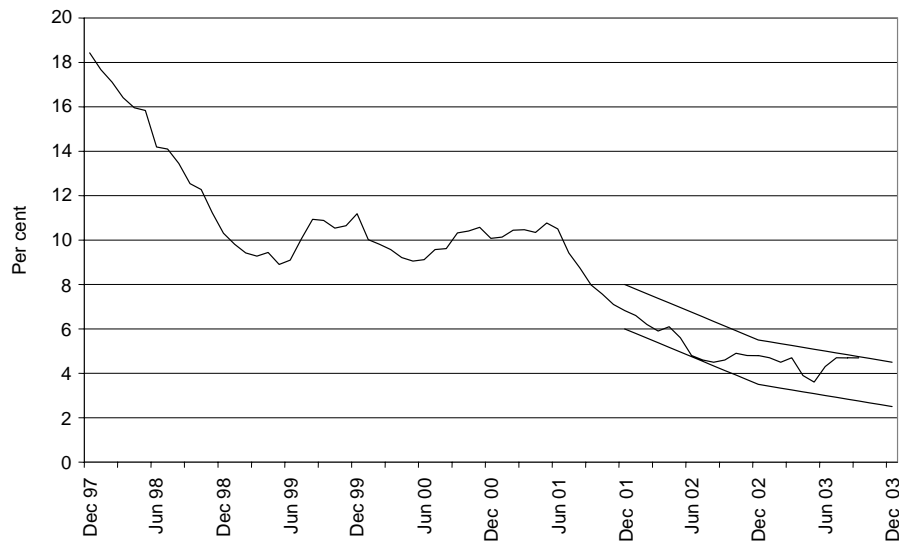
By the end of 2002, inflation had declined to 4.8%, again meeting the target of 4.5% ± 1 percentage point. During this period, the currency remained on an appreciating trend and capital inflows into the forint bond market became even stronger, exceeding EUR 3 billion in 2002. The average maturity of foreign holdings was increasing in parallel with the outstanding stock of forint-denominated bonds (Graph 2), reflecting the convergence play strategy of investors. Market optimism was boosted by the successful conclusion of EU accession talks at the Copenhagen summit in November 2002.

Beneath the surface, however, serious tensions had started to build up in the economy. 2002 was an election year in Hungary, which led to a loosening of fiscal policy. As a consequence, in 2002 the deficit of the general government almost doubled, reaching 9.2% of GDP.

There were also other problems that made the conduct of monetary policy a challenging task. The original strategy of inflation targeting was built on the exchange rate pass-through mechanism, as is quite common in emerging market IT regimes. The Monetary Council had regularly communicated a narrow (approximately 2% wide) “desired” exchange rate band, which would lead the economy to a path consistent with the inflation target. The market found these guidelines credible and useful, with the market rate remaining within these bands. However, the impact of tight monetary conditions on consumer prices turned out to be weaker than expected due to the unexpected fiscal expansion and high nominal wage growth. Thus, the central bank had to announce ever stronger levels of the

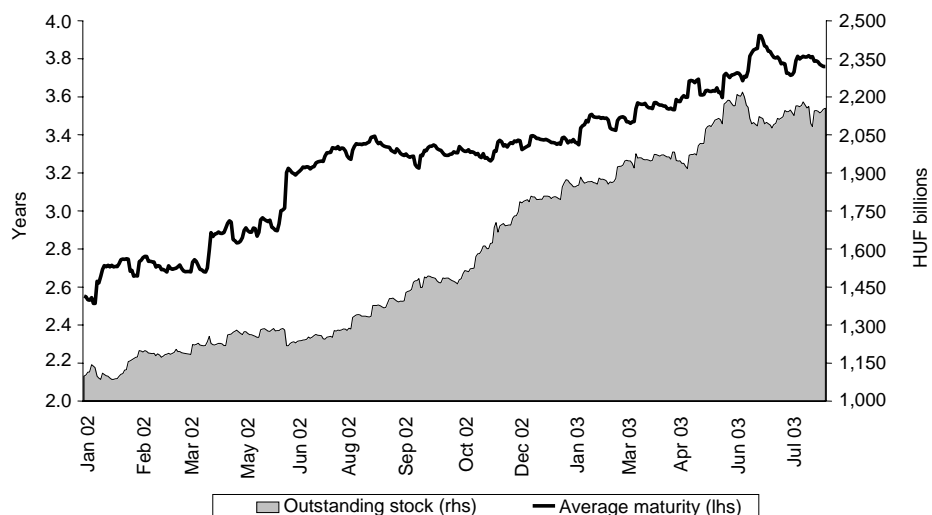
exchange rate consistent with the inflation target. By the end of 2002, the “desired” level of the exchange rate needed for reaching the inflation target had moved close to the strong edge of the exchange rate band (Graph 3).

Graph 1
Inflation rate and targets



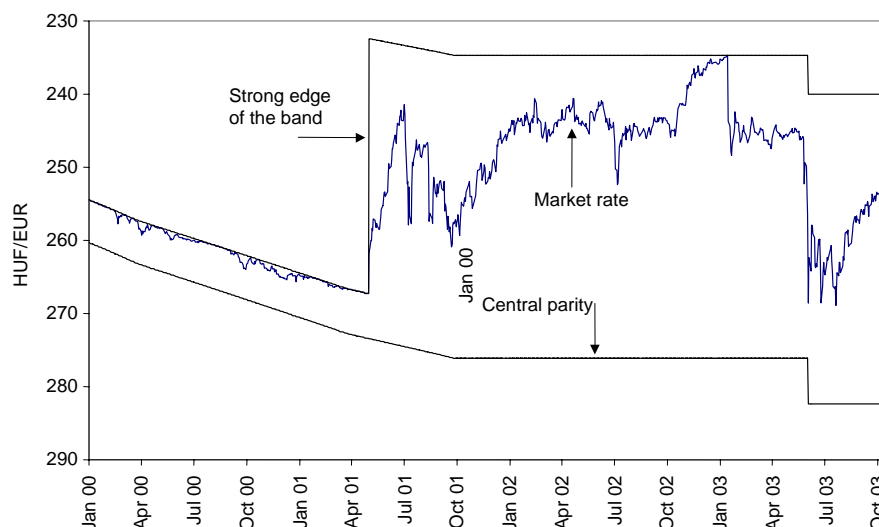
Source: Central Statistical Office.

Graph 2
Outstanding stock and average maturity of
non-residents' government securities holdings



Source: MNB.

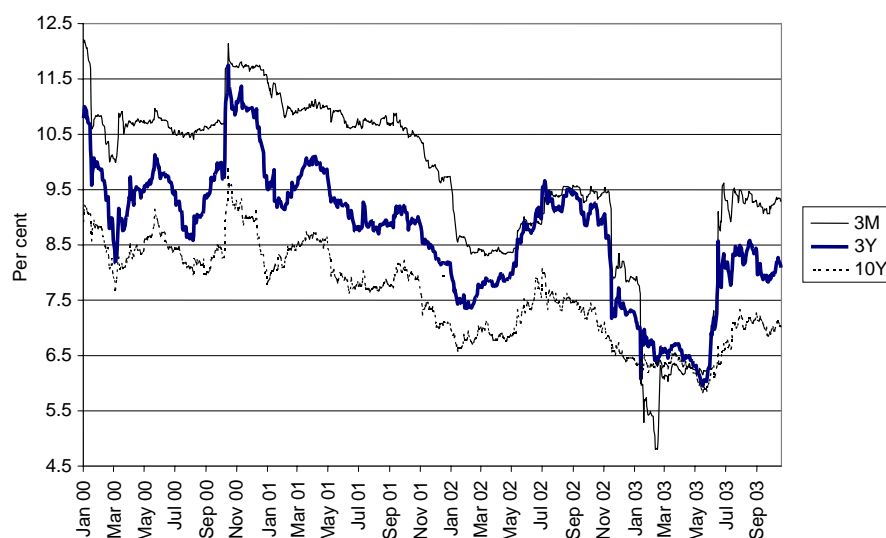
Graph 3
Exchange rate of the forint (inverted scale)



Source: MNB.

By early 2003 market players, especially foreign investors, had come to the conclusion that to reach the inflation target the authorities would lift the strong end of the band and let the forint appreciate. In mid-January, there was a speculative capital inflow in excess of EUR 5 billion within two days in the expectation that the exchange rate would be allowed to appreciate beyond the upper band. However, speculators apparently neglected legal arrangements concerning the responsibilities for the exchange rate regime, which state that any change in regime, including the change in the bands, needs a consensus between the MNB and the government. The government was opposed to widening the exchange rate band because of concerns that the stronger forint would hurt competitiveness. It was therefore decided to defend the upper band by intervention (buying foreign exchange against the forint) and to cut interest rates drastically, thereby demonstrating to the market the MNB's commitment to maintaining the exchange rate band. After these actions, both policymakers and market participants started to adjust to the new situation, with the exchange rate stabilising some 4-5% below the strong edge of the band. As a response to the large interest rate cuts, the short end of the yield curve shifted downwards significantly, with the three-month benchmark rate falling to the level of long yields at about 6.2% (Graph 4).

Graph 4
Benchmark government securities yields



Source: Government Debt Management Agency.

In early June 2003, the government initiated a 2.2% devaluation of the exchange rate band in order to cap the strong edge of the band at HUF 240 per euro, instead of the previous level of HUF 234.7 per euro (Graph 3). The aim was to assure exporters that the currency would not be allowed to appreciate beyond the new upper edge of the band. This move disturbed the markets, as it was interpreted as a loss of commitment to disinflation. As a result, the exchange rate depreciated by 5% on the day of the devaluation. To stop a further depreciation and to demonstrate commitment to disinflation, the MNB hiked interest rates by 300 basis points in June.

In July, the government and the MNB declared that Hungary aimed to join the euro area by January 2008 and ERM II as early as possible after EU accession in May 2004. This commitment would require very tight fiscal and incomes policies in the coming years. The 2004 budget submitted to parliament foresaw a reduction in the deficit, but the budget plans caused some disappointment among market participants, as it focused on increasing revenues instead of reforming public expenditure. The exchange rate did not respond positively and long-term yields did not decrease. The market is still hesitant at the time of writing and is looking for visible signs of fiscal tightening. One positive sign is that the wage guidelines agreed with the trade unions will, if respected by all interested parties, help the disinflation process.

4. Conclusions

Some conclusions can be drawn from the Hungarian experiences.

1. Smooth transition to a successful inflation targeting regime is possible even for countries lacking experience with traditional channels of monetary transmission. The example of the MNB in 2001 and 2002 shows that well chosen inflation targets can be reached, even if there is little a priori knowledge of the exchange rate pass-through of an appreciating currency.
2. The Maastricht criteria require parallel attainment of price and exchange rate stability. However, in some situations central banks in accession countries cannot target price and exchange rate stability at the same time. In Hungary, for instance, monetary policy had to rely to a great extent on the exchange rate pass-through in the process of disinflation. Keeping the exchange rate stable when price stability has to be reached from a starting point of high inflation could thus prove quite challenging.
3. The recent Hungarian experience clearly underscores the importance of an appropriate mix of monetary and fiscal policies to reach and maintain price stability. If fiscal policy runs unsustainable deficits the central bank is left with no good options: it can either respond to the loose fiscal policy by creating tight monetary conditions (which can lead to excessive loss of output and prolonged conflicts with the government) or risk its own credibility by accommodating the fiscal loosening and thus loosening its commitment to price stability. In other words, there is no good monetary policy if policymakers cannot see eye to eye on the objective of price stability and on the best policy mix to achieve it.

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Globalisation, financial markets and the operation of monetary policy in India

Rakesh Mohan¹

Monetary policy in India underwent significant changes in the 1990s as the Indian economy became increasingly open and financial sector reforms were put in place. In the 1980s, monetary policy was geared towards controlling the quantum, cost and direction of credit flow in the economy. The quantity variables dominated as the transmission channel of monetary policy. Reforms during the 1990s enhanced the sensitivity of price signals from the central bank, making interest rates the increasingly dominant transmission channel of monetary policy in India.

The openness of the economy, as measured by the ratio of merchandise trade (exports plus imports) to GDP, rose from about 18% in 1993-94 to about 26% by 2003-04. Including services trade plus invisibles, external transactions as a proportion of GDP rose from 25% to 40% during the same period. Along with the increase in trade as a percentage of GDP, capital inflows have increased even more sharply: foreign currency assets of the Reserve Bank of India (RBI) rose from USD 15.1 billion in March 1994 to over USD 140 billion by March 15, 2005. These changes have affected liquidity and monetary management. Monetary policy has responded continuously to changes in domestic and international macroeconomic conditions. In this process, the current monetary operating framework has relied more on outright open market operations and daily repo and reverse repo operations than on the use of direct instruments. Overnight interest rates are now gradually emerging as the principal operating target.

With the continuing increase in foreign currency assets accompanied by sterilisation, the balance sheet of the Reserve Bank has undergone changes in its asset and liability structure, which in the current situation is posing a challenge. Against this backdrop, the recent developments in monetary policy in India are reviewed in three parts, particularly focusing on its continuing evolution as the economy becomes more open. Section I briefly outlines the monetary policy framework and how it has evolved recently. Section II focuses on the management of interest rates and exchange rate in the face of sustained capital inflows. The final section flags the dilemmas and policy challenges.

1. Monetary policy framework

The framework of monetary policy in India is signaled by regular semiannual statements: the Annual Monetary and Credit Policy Statement in April/May and the Mid Term Review in October/November. However, monetary measures are taken promptly and effectively, whenever required, to respond to ongoing developments in both the domestic and global markets. The two formal statements serve several purposes. They provide a framework for or supplement to the monetary and other relevant measures that are taken from time to time in response to events affecting macroeconomic assessments, in particular relating to fiscal management as well as seasonal factors. They also set out the logic, intentions and actions related to the structural and prudential aspects of the financial sector. The biannual statements thus enhance transparency, improve communication and contribute to an effective consultation process.

The preamble to the Reserve Bank of India Act sets out the objectives of the Bank as being “to regulate the issue of Bank notes and the keeping of reserves with a view to securing monetary stability in India and generally to operate the currency and credit system of the country to its advantage”. Although there has not been any explicit legislation for price stability, the twin objectives of monetary

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policy in India are (i) price stability and (ii) provision of adequate credit to productive sectors of the economy. With the increasing openness of the Indian economy, greater emphasis has been given to strengthening the institutional capacity to support growth consistent with stability in the medium term. On balance, price stability has evolved as the dominant objective of monetary policy for sustaining economic growth and ensuring orderly conditions in the financial markets. The underlying philosophy is that it is only in a low and stable inflation environment that economic growth can be sustained. Monetary policy also aims to support growth by ensuring that the credit requirements of various segments are met through an appropriate credit delivery and pricing mechanism and the development of a credit culture that is conducive to market development.

Between the mid 1980s and mid 1990s, India followed a monetary policy framework which could broadly be characterised as a flexible monetary targeting approach. Under this approach, growth in broad money supply (M3) was projected in a manner consistent with expected GDP growth and a tolerable level of inflation. The M3 growth thus worked out was considered a nominal anchor for policy. Reserve money (RM) was used as the operating target and bank reserves as the operating instrument. However, as deregulation increased the role of market forces in the determination of interest rates and the exchange rate, the monetary targeting framework came under stress. By increasing liquidity, capital flows put upward pressure on the money supply. There was also increasing evidence of changes in the underlying transmission mechanism of monetary policy. With pricing decisions left to market forces, interest rates and the exchange rate gained in importance vis à vis quantity variables. Most studies in India showed that money demand functions had been fairly stable. However, it was felt that the financial innovations that had recently emerged in the economy provided some evidence that the dominant effect on the demand for money in the near future need not necessarily be from real income, as it had been in the past. Interest rates do seem to exercise some influence on the decision to hold money. Accordingly, the monetary policy framework was reviewed towards the late 1990s, and the Reserve Bank has switched over to a more broad-based multiple indicator approach since 1998-99. In this approach, policy perspectives are obtained by looking at interest rates or rates of return in different markets (money, capital and government securities markets), high frequency data such as currency, credit extended by banks and financial institutions, fiscal position, trade, capital flows, inflation rate, exchange rate, refinancing and transactions in foreign exchange, and output data. However, for simplicity and greater understanding, the biannual statements still set out the framework in terms of money, output and prices.

Efforts initiated in the late 1980s to develop the money market were intensified in view of the critical role it plays in facilitating the conduct of monetary policy and in improving the transmission mechanism. The government securities market has been developed since the early 1990s. Along with the use of an auction-based system, this has enabled price discovery and improved the fungibility and liquidity of the market. Measures have been initiated to integrate the Indian forex market with the global financial system, with increasing freedom given to banks to borrow abroad and fix their own position and gap limits. With increasing market orientation, the monetary policy statements have been focusing on structural and regulatory measures designed to strengthen the financial system and to improve the functioning of various segments of the financial market. These measures, introduced after extensive consultations with experts and market participants, have been directed towards increasing the operational effectiveness of monetary policy, redefining the regulatory role of the Reserve Bank, strengthening the prudential and supervisory norms, improving the credit delivery system and developing the technological and institutional framework of the financial sector. The interaction of technology with deregulation has also contributed to the emergence of a more open, competitive and globalised financial market.

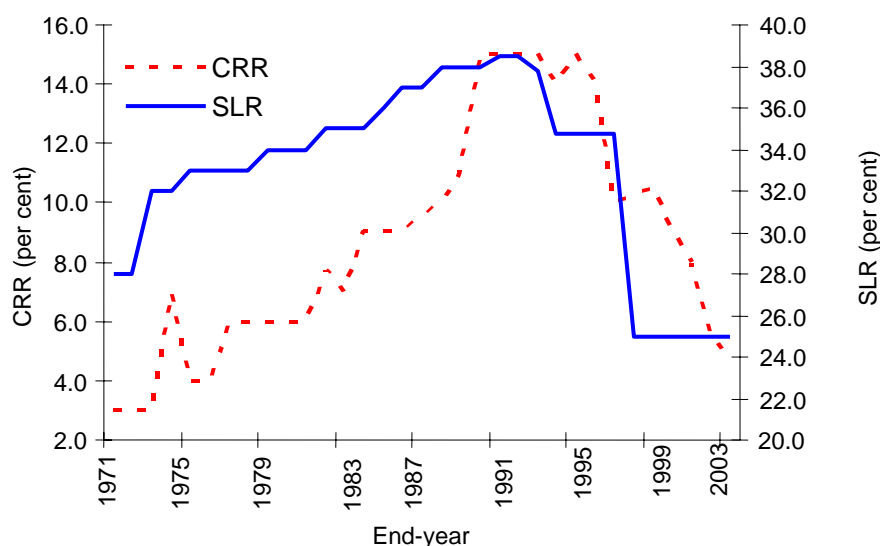
The reform of the monetary and financial sectors has enabled the Reserve Bank to expand the array of instruments at its command and enhanced its ability to respond to shocks. The efficacy of monetary policy has also improved as a result of a conscious effort to progress from direct instruments of monetary control to indirect instruments.

Over the years, the reliance on reserve requirements, particularly the cash reserve ratio (CRR), has been reduced as an instrument of monetary control. The CRR has been brought down, notwithstanding intrayear variations, from a peak of 15% in 1994-95 to 5% currently.² The objective of

² The prescribed CRR reached a low of 4.5 per cent in June 2003 before being revised to 5 per cent in two stages in September/October 2004. This increase in CRR was necessitated, partly for absorbing liquidity in the system, but more

policy is to reduce the CRR to its statutory minimum of 3% over a period of time. During the 1980s, the financial markets were highly segmented and controlled and the interest rates in the government securities market and the credit market were tightly regulated. Credit was extended to the Government by mandating the maintenance of a minimum statutory liquidity ratio (SLR) whereby the commercial banks set aside substantial portions of their liabilities for investment in government securities at below market interest rates. The SLR, which had increased to about 37.5% in the beginning of the 1990s, was brought to its statutory minimum of 25% by October 1997 (Graph 1). The rates of interest on government securities are also determined by the market through an auction process. Though banks continue to hold a substantial part of their portfolio in government securities, more than the statutory minimum, it is more as a result of their risk perception and portfolio choice than of statutory compulsion. The RBI has also made a proposal to the Government to amend the Reserve Bank of India Act and the Banking Regulation Act so as to allow the Reserve Bank greater flexibility to reduce the CRR and SLR below the current statutory minimum, if the monetary situation so warrants.

Graph 1
Reserve requirements



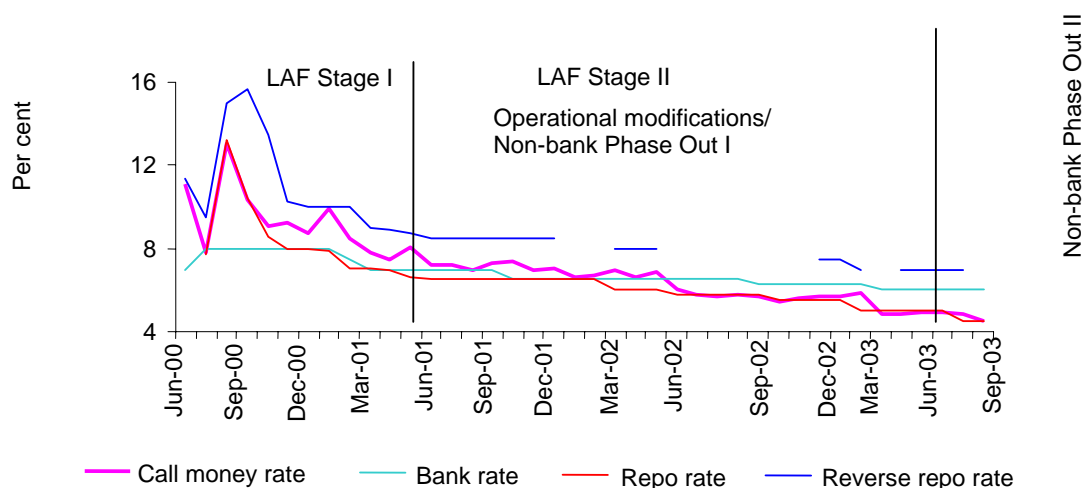
As reliance on direct instruments of monetary policy has declined, liquidity management in the system has been increasingly carried out through open market operations (OMO) in the form of outright purchases/sales of government securities and daily repo and reverse repo operations. The OMO are supplemented by access to the Reserve Bank's standing facilities and direct interest rate signals through changes in the Bank rate/repo rate. A liquidity adjustment facility (LAF) was introduced in June 2000, which has emerged as the principal operating instrument of monetary policy. The LAF enables the RBI to modulate short-term liquidity under varied financial market conditions in order to ensure stable conditions in the overnight (call) money market. The LAF operates through daily repo and reverse repo auctions that set a corridor for the short-term interest rate consistent with policy objectives (Graph 2). Although there is no formal targeting of overnight interest rates, the LAF has enabled the Reserve Bank to de-emphasise targeting of bank reserves and focus increasingly on interest rates. This has also helped in reducing the CRR without engendering liquidity pressure.

A number of reforms have been implemented in the financial sector and monetary policy has evolved with increasing globalisation. However, monetary policy has had to contend with a sustained high fiscal deficit and mounting debt accumulation. The fiscal position of both the Central and State

importantly for signalling the Bank's concern at the unacceptable level of inflation and also to keep the stability in financial market condition.

Governments was under stress throughout the 1980s and 1990s. The combined gross fiscal deficit (GFD) reached a level of 10% in 1990-91, compared with 7.9% 1980-81. There was some evidence of fiscal correction during the first half of the 1990s in terms of a fall in the fiscal deficit and public debt. Subsequently, however the fiscal situation deteriorated with the combined deficit hovering around 10% during the second half of the 1990s. The average combined GFD/GDP, which was 8% during 1981-82 to 1989-90, did improve to 7.4% during 1990-91 to 1996-97, but thereafter deteriorated sharply to 9.0% during 1997-98 and 2004-05. The slippage in the deficit was also reflected in the large growth in government borrowing.

Graph 2
Evolution of the liquidity adjustment facility



In most circumstances, the spillover effect of a high fiscal deficit would be reflected in a large current account deficit and inflation. However, this period was marked by dampened investment demand from the private sector accompanied by high private saving. As a result, the overall saving-investment gap narrowed, and the current account deficit was small; it turned into a modest surplus during 2001-02.

As manager of public debt, the RBI is responsible for ensuring smooth implementation of the Government's market borrowing programme. Reforms have deepened the government securities market. In the context of the continued large market borrowing programme of the Government, the Reserve Bank has on occasion accepted private placement of government securities along with open market operations. This policy meets the twin objectives of managing liquidity in the system and containing volatility in the secondary market. The release of government securities into the market thereafter serves to modulate both liquidity and interest rate volatility. This approach has helped in balancing monetary policy objectives with debt management objectives and in the process has imparted stability to the financial market. Further, the continuing foreign exchange inflows and moderate demand for credit from the corporate sector have enabled the Reserve Bank to maintain relatively low interest rates in spite of a high fiscal deficit.

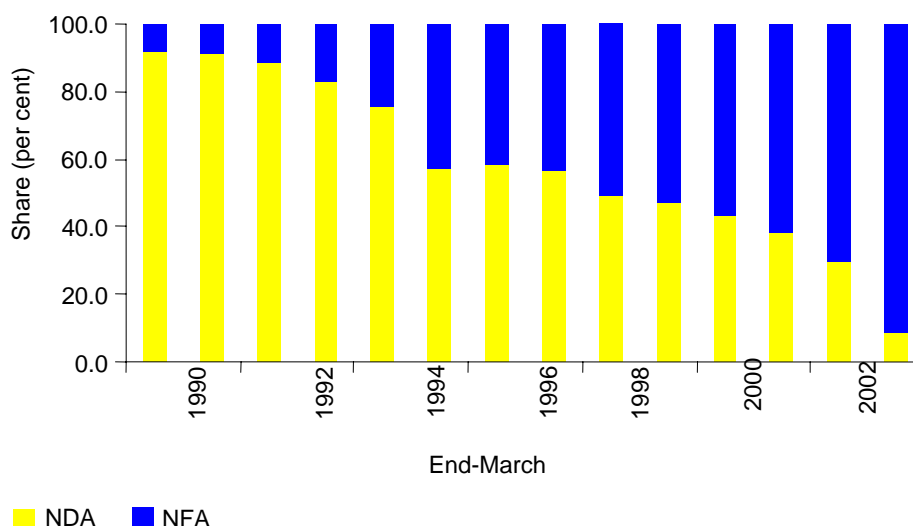
Since 1997, in addition to maintaining low inflation, monetary policy in India has been concerned with the revival of investment demand. Accordingly, monetary policy has focused on ensuring adequate liquidity and has favoured low and flexible interest rates. This monetary policy stance has been signaled through cuts in the Bank rate, LAF rates and the CRR. The pace and magnitude of easing has, however, been conditioned by the need to ensure macroeconomic and financial stability, particularly in the context of continuing large external capital flows. The successive annual policy statements and mid-term reviews of the RBI have also highlighted the structural and regulatory measures required to strengthen the financial system. These measures have been adopted in order to increase the operational efficacy of monetary policy, redefine the regulatory role of the Reserve Bank, strengthen prudential norms and develop the technological and institutional infrastructure.

2. Management of capital inflows

Following the adoption of structural reforms and external liberalisation in the early 1990s, the Indian economy experienced surges of capital inflows; an indicator of the consequences of globalisation. Net capital inflows increased from an average of USD 5.8 billion (INR 82 billion, or 2.2% of GDP) per annum during the second half of the 1980s to USD 9.1 billion (INR 354 billion, or 2.2% of GDP) per annum in the second half of the 1990s and to an average of USD 15.7 billion (INR 735 billion, or 3.1% of GDP) in 2002-03 2003-04. While the capital inflows eased the external financing constraint, they also posed dilemmas for the conduct of monetary policy. With overall surpluses in the balance of payments emerging as the dominant factor driving money supply, monetary policy action was needed to ensure that the pursuit of the final target of growth with price stability was not endangered.

The principal instrument for managing capital inflows in India has been sterilisation. In order to neutralise the expansionary impact of rising net foreign exchange assets (NFA) in the monetary base, the Reserve Bank resorted to open market sales of government securities from its portfolio. In this context, the operationalisation of the Market Stabilisation Scheme (MSS) has given an additional instrument for liquidity management. MSS is an arrangement between the Government of India and RBI to mop up the excess liquidity generated on account of the accretion to the foreign exchange assets of RBI to neutralise the monetary impact of capital flows. Under the scheme, RBI issues Treasury Bills/dated government securities by way of auctions and the cost of sterilization is borne by the Government. The ceiling on the outstanding obligations of the Government by way of issuance of such bills/securities under MSS was initially placed at Rs.60,000 crore in March 2004 but is subject to revision through mutual consultation and the ceiling is presently at Rs.80,000 crore. The bills/securities issued under MSS are matched by an equivalent cash balance held by the Government in a separate identifiable cash account maintained and operated by RBI and such balances would be appropriated only for the purpose of redemption and/or buy-back of the Treasury Bills and/or dated securities issued under the MSS. As on March 18, 2005, Rs.64,211 crore was mobilised under MSS. As a result, there has been offsetting movement between the NFA and net domestic assets (NDA) of the Bank (Graph 3). This could be gauged from the fact that the share of NFA in reserve money (RM) has risen from under 10% in March 1991 to over 123% now (as at March 25, 2005). Similarly, the NFA to currency ratio rose from about 15.0% to over 165.2% during the same period. Because of sterilisation operations, the growth in RM could be contained within the desired trajectory in order to avoid excessive money creation. Consequently, the average annual growth in RM in the recent 10 year period between 1994-95 and 2003-04 fell to 12.3%, from 16.8% in the preceding 10 years between 1980-81 and 1989-90. The growth of broad money supply was also lower, at 16.5% as against 17.2% during the comparable period. Thus, domestic money supply has remained by and large unaffected by the external inflows and consequent build-up of foreign exchange reserves.

Graph 3
Shift in domestic and foreign assets of the RBI



The conduct of discretionary monetary policy in the face of surges in capital flows has engaged considerable attention in the literature. A key issue is whether or not monetary policy is rendered ineffective by capital flows. Does the monetary stance (say, a tightening effected through reduction of NDA) get completely offset by the expansion of NFA on account of capital inflows? An examination of the offset coefficient - the response of NFA to (exogenous) changes in NDA - provides some clues. An offset coefficient close to unity would imply that the efforts to tighten monetary policy induce equal offsetting foreign inflows, leaving no scope for independent monetary policy. In contrast, an offset coefficient of zero would imply that the monetary authority has complete control over the money supply and, therefore, discretion in the conduct of monetary policy. Empirical studies show that the Reserve Bank has been able to offset the expansionary effect of foreign capital flows on domestic money supply, consistent with its macroeconomic objectives.³ While sterilised intervention appears to have been conducted successfully so far, there is also the critical issue of the exchange rate regime and the related issues of the quasi-fiscal costs of intervention and the level of domestic interest rates. Monetary policy has to contend with the reality that the speed of change in capital flows can be much greater than that in the current account, even if the capital account is not fully convertible.

India's current exchange rate policy has focused on managing volatility without a fixed rate target. The underlying demand and supply conditions are allowed to determine exchange rate movements over a period in an orderly manner. Recent international research on viable exchange rate strategies has lent considerable support to the exchange rate policy followed by India. In this context, the overall approach to the management of foreign exchange reserves has reflected the changing composition of the balance of payments, and has endeavoured to reflect the "liquidity risks" associated with different types of flows and other requirements. The policy of reserve management is thus judiciously built upon a host of identifiable factors and other contingencies. Such factors, include, inter alia: the size of the current account deficit; the size of short-term liabilities (including current payment obligations on long-term loans); the possible variability in portfolio investment and other types of capital flows; the unanticipated pressures on the balance of payments arising out of external shocks; and movement in the repatriable foreign currency deposits of non resident Indians (NRIs).

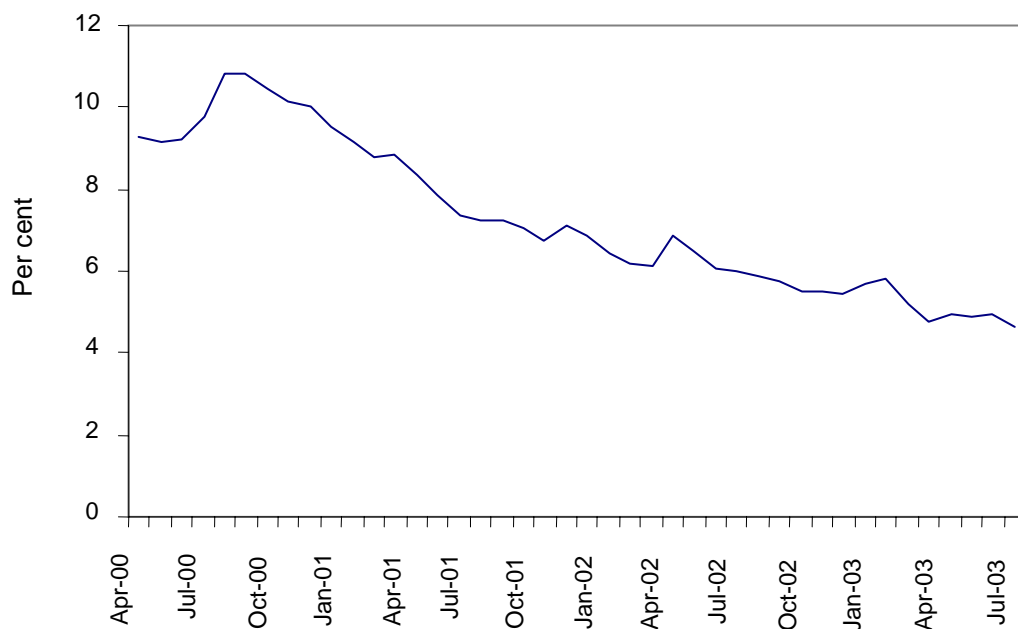
The substantial growth in reserves in the recent period has generated a welcome debate regarding the costs and benefits of holding reserves. In any cost-benefit analysis on this topic, it is essential to keep in view the objectives of holding reserves in emerging markets, which cover, inter alia: (a) maintaining confidence in monetary and exchange rate policies; (b) enhancing the capacity to intervene in forex markets; (c) limiting external vulnerability so as to absorb shocks during times of crisis; (d) providing confidence to the markets that external obligations can always be met; and (e) reducing volatility in foreign exchange markets. Sharp exchange rate movements can be highly disequilibrating and costly for the economy during periods of uncertainty or adverse expectations, whether based on problems that are real or imagined. For developing countries, these economic costs are likely to be substantially higher than the net financial cost of holding reserves. In this context, it is important to note that in India, in the last few years, almost the whole addition to reserves has been made without increasing the overall level of external debt. The increase in reserves largely reflects higher remittances, quicker repatriation of export proceeds and non debt inflows. Even after taking into account foreign currency denominated NRI flows (where interest rates are linked to Libor), the financial cost of additional reserve accumulation in India in the recent period is quite low, and is likely to be more than offset by the return on the additional reserves.

Notwithstanding sustained sterilised intervention, there has been an all-around reduction in interest rates in recent years to historically low levels. For example, the overnight call money rate fell from 13.06% in August 2000 to 4.86% in March 2005. The 91 day and 364 day Treasury bill rates fell from 10.47% and 10.91% to 5.37% and 5.61%, respectively. Secondary market yields on government securities with one year, 10 year and 20 year residual maturities declined from 10.82%, 11.47% and 11.61% to 5.67%, 6.66% and 7.08% respectively between August 2000 and March 2005. The interest rates on AAA rated corporate bonds also fell, from 12.1% in August 2000 to 7.14% in March 2005

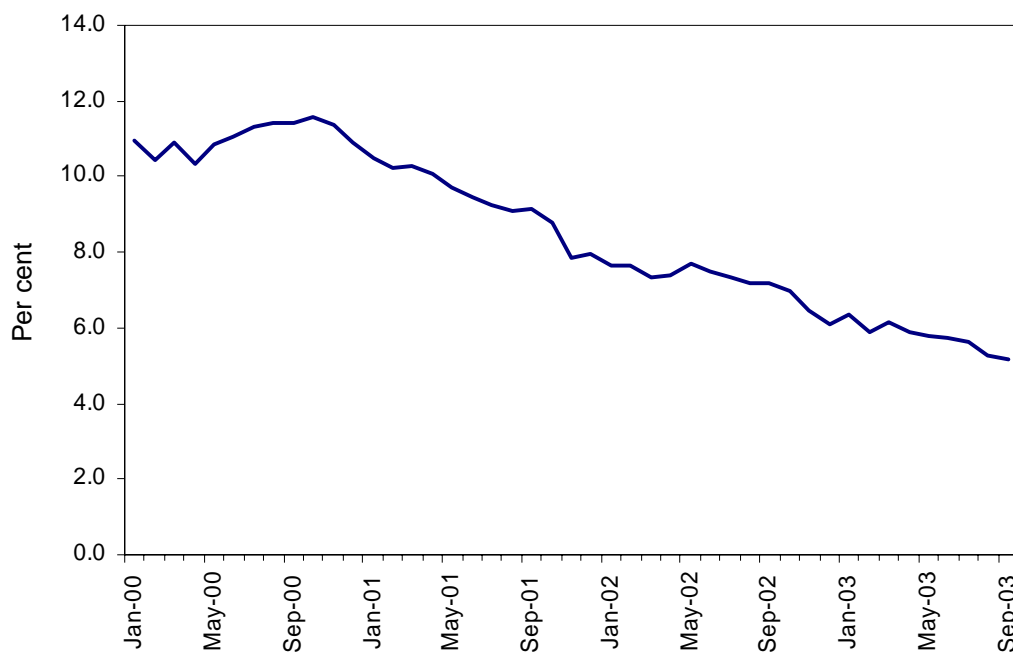
³ For India, the offset coefficient was estimated to be mildly negative (-0.3) over the period April 1993 to March 1997 suggesting that monetary policy (including sterilisation operations) was sufficiently independent of external factors to pursue domestic goals. Granger causality tests for the period April 1994 to March 2003 indicated a unidirectional causality from changes in NFA to NDA. Thus, capital inflows were not induced by domestic monetary conditions. Moreover, the sterilisation coefficient - the response of change in NDA to that in NFA - was (-)0.83. This implies that an increase of INR 100 in NFA attracted a policy response of sterilisation that drained away NDA worth INR 83 from the system.

(Graphs 4 to 7). The average cost of government borrowing declined from about 11% during 2000-01 to 5.96% in 2004-05 (up to December 15, 2004). Thus, contrary to conventional thinking, sterilised intervention has not resulted in an increase in interest rates.

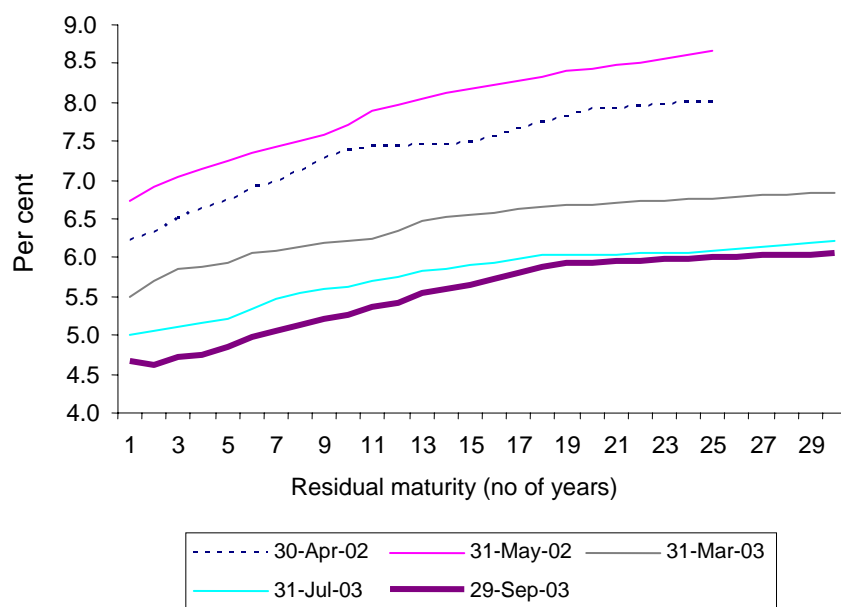
Graph 4
364 day Treasury bill yield



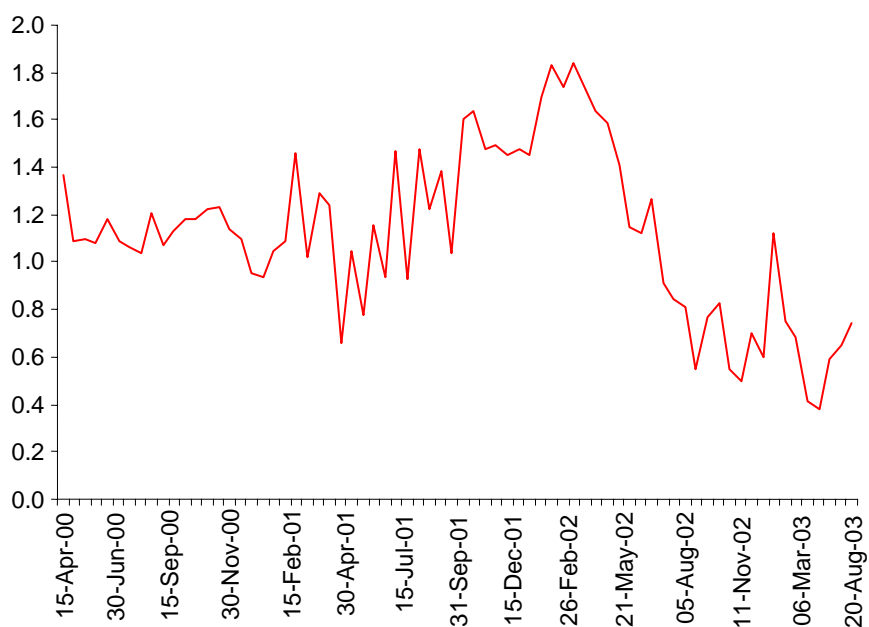
Graph 5
Yield to maturity of 10-year government securities



Graph 6
Yield curves for central government dated securities



Graph 7
Spread between AAA-rated corporate bond yield
and yields on government securities (five-year)



3. Dilemmas and policy challenges

The current situation is characterised by large capital inflows, resulting in the rise of reserves to over USD 90 billion. The inflows are continuing to increase and are currently coming through foreign institutional investment. The RBI has been managing the monetary situation through a variety of measures including partial sterilisation through direct OMO and daily repo operations and reduction in non-resident deposit rates to remove arbitrage opportunities. The broad principle guiding exchange rate management has been the careful monitoring and management of exchange rates without a fixed target or a pre-announced target or a band. Thus, there is flexibility in the exchange rate together with ability to intervene, if and when necessary. Reflecting the large inflows of capital, the exchange rate of the rupee appreciated by about 4.8% between April and October 2003 from INR 47.50 to INR 45.32 against the US dollar. The surfeit of liquidity has enabled the Government to finance its borrowing at progressively lower rates. Since the demand for credit by the corporate sector has been low over the last two years, crowding out by the government sector has not occurred. Furthermore, many corporates are showing a preference to borrow in US dollars to take advantage of the low international rates as compared to the higher rupee lending rates by banks and expectations of exchange rate appreciation. This has also resulted in a lot of unhedged exposure, which might entail significant but unavoidable risks to some corporate balance sheets, possibly impacting the quality of banks' assets in some cases. Monetary policy is, therefore, currently focusing on consolidating the success achieved in recent years in reining in inflation expectations, ensuring liquidity is available to industry sectors which are showing signs of a pickup and a revival of investment demand, sensitising banks to the impact on their balance sheets of a possible change in monetary conditions due to a credit pickup, and being prepared for some moderation in capital flows if the stance of monetary policies of industrial countries moves from an easy or neutral to a relatively tighter regime.

The ultimate success of monetary policy could be judged in terms of inflation performance and the central bank's ability to maintain stable conditions in the financial market. The pursuit of price stability was central to the process of financial sector reforms initiated during the 1990s. Although inflation is not targeted per se, monetary policy was formulated with the stated objective of curbing inflationary expectations. The Indian inflation record over the past five decades can be considered satisfactory as compared with many developing economies, and performance improved significantly during the second half of the 1990s. The average headline inflation rate has come down to about slightly below 5.0% over the last five years as compared to the long period average of 7-8%. Apart from domestic factors, the decline in inflation coincided with the current phase of disinflation characterising the global business cycle. The guiding principle for inflation management continues to be that in the medium to long run, price increases largely reflect monetary expansion. In the short run, however, inflation could be affected by non-monetary factors, especially on the supply side. Consequent to the reduction in the inflation rate, inflation expectations have also come down. While the openness of the economy to international trade has partly contributed to the low inflation, more recently increases in oil and non-oil commodity prices have posed upside risks to inflation. Further, there are dangers of asset price inflation being transmitted through large capital inflows. Thus, notwithstanding sustained efforts over time to help build confidence in price stability, market sentiment can shift suddenly if prices increase noticeably. Hence, monitoring of international inflation and interest rates has become an integral part of monetary policy making.

The encouraging inflation performance has been reflected in falling interest rates. The monetary policy stance has been signaled through cuts in the Bank rate, the LAF rate and the CRR. The reduction in inflation and interest rates has occurred along with strong GDP growth, which averaged 6.2% a year over the last 10 years. In 2003, favourable monsoon rains and sustained industrial growth boosted the macroeconomic outlook. Even without the monsoon performance, the favourable macroeconomic outlook reflects the strong corporate results recorded during the last two years, due to lower costs and greater efficiency. As a result, even the current low domestic interest rates have been associated with strong capital inflows, particularly from NRIs. However, the fall in interest rates has only translated into falling yields in the financial markets. The full impact of the monetary policy stance on economic activity has been constrained by the structural rigidities in the financial system, especially on account of downward inflexibility in the interest rate structure and operating costs of financial intermediaries. In the credit market, lending rates for prime corporates and activities like housing have declined significantly, but noticeable reductions are yet to take place in other sectors. Monetary authorities face the dilemma of surplus liquidity in financial markets together with inadequate credit demand for financing sustained growth in the real sector.

Although the Indian financial markets have become increasingly integrated with the international markets, segmentation and inefficiencies in the market have given rise to risk-free arbitrage opportunities in certain types of deposits. The Reserve Bank, for instance, had to act on three occasions in 2003 to reduce the interest rates on non-resident external (NRE) deposit accounts and have aligned such deposit rates to US dollar Libor. The non-resident foreign currency (FCNRB) deposit rates are already linked to Libor/swap rates of respective currencies and maturities. In addition, overseas corporate bodies (OCBs) were no longer recognised as a distinct eligible class of investors in India. Certain restrictions were also placed on the operations of offshore banking units (OBUs). In addition, the Government of India prepaid foreign currency loans of about USD 3.0 billion to the Asian Development Bank and the World Bank by buying foreign exchange from the Reserve Bank. Similarly, the RBI made available USD 5.2 billion from its reserves to the State Bank of India (SBI) to redeem the entire stock of Resurgent India Bonds (RIBs) raised earlier to bolster India's foreign exchange reserves. Notwithstanding these recent initiatives to reduce foreign currency assets, the exchange rate vis-à-vis the US dollar has shown an appreciating trend in part because of the dollar's weakness vis-à-vis other major currencies and continued strong capital inflows on expectations of a positive economic outlook.

Economic theory suggests that when the nominal exchange rate is used as a nominal anchor, monetary policy goals are subservient to exchange rate policy. If the exchange rate is flexible, monetary policy is conducted by influencing the money supply and interest rates. In an open economy, the exchange rate and interest rate objectives became intertwined as real and monetary shocks are transmitted across national boundaries, making the conduct of monetary policy more challenging.

The Reserve Bank has so far been able to balance its objectives of exchange rate and monetary policy objectives by choosing an intermediate exchange rate regime coupled with sterilised intervention. Sterilisation imparts necessary flexibility to monetary policy to serve the domestic objective of low and stable prices and low and flexible interest rates. The reform process has impacted the Reserve Bank's balance sheet in terms of its asset composition and also created changes in the sources of revenue and expenditure. A scenario of continued capital inflows is likely to pose certain constraints in the operation of the current monetary policy stance.

Looking ahead, further refinements in operating procedures have to be carried forward, both for day-to-day liquidity management and for equitable delivery of credit. This becomes necessary in the context of the low interest rate stance and the need to maintain adequate liquidity in financial markets, while narrowing operating spreads in policy rates as well as market-related rates. With the progressive integration of different segments in the financial market, it should be possible in the medium term to fine-tune monetary policy operations to manage market conditions through a narrow interest rate corridor. With capital flows expected to remain strong, a key issue in the future would be greater innovation in the use of available instruments to deal with the expected strong capital flows. The RBI is conscious of the need to monitor international developments closely and carefully and fine-tune its policies and use of instruments to effectively counter emerging situations. In this regard, it is recognised that sterilisation is a first stage response for ongoing liquidity management until more durable policies can be put in place to absorb capital flows for the expansion of productive capacity. Furthermore, sterilisation has built-in costs and limitations. The growing internationalisation of monetary policy arising from the cross-border integration of financial markets also emerges as an important issue. In this context the exercise of discretion in the conduct of domestic monetary policy becomes challenging.

Indonesian policy on non-residents' participation in the money market: the restriction of rupiah transactions by non-residents and foreign currency credit offered by banks to non-residents

Hartadi A Sarwono¹

Background

The financial crisis which began in the second half of 1997 devastated Indonesia's banking sector and resulted in a prolonged economic downturn that continues to affect the economy today. The source of the crisis can be traced to the acceleration of Indonesia's economic integration into the global financial market, without the corresponding development of the required institutions to ensure the smooth running of the financial and corporate sectors. Among other liberalisations, the Government allowed the rupiah to be freely convertible for capital account transactions as well as current account transactions and at the same time permitted the internationalisation of the currency.² Indonesia allowed the development of an active offshore market in the rupiah. The rupiah became a commodity tradable in the international market. The international use of the rupiah for export and import payments, however, was not significant. Export and import invoices were mostly denominated in major world currencies, including the US dollar and Japanese yen. Therefore, the internationalisation of the rupiah was confined mostly to the financial market. These actions encouraged both the banking and corporate sectors to borrow freely from external sources.

This liberalisation process, however, was not supported by efforts to strengthen public and corporate governance. Furthermore, the weakness in the availability and quality of data and information also compromised the quality of decision-making by the business sector and the government. Finally, the exchange rate regime at the time, which attempted to manage the fluctuation of the rupiah within a narrow band, was inconsistent with monetary policy to control inflation.

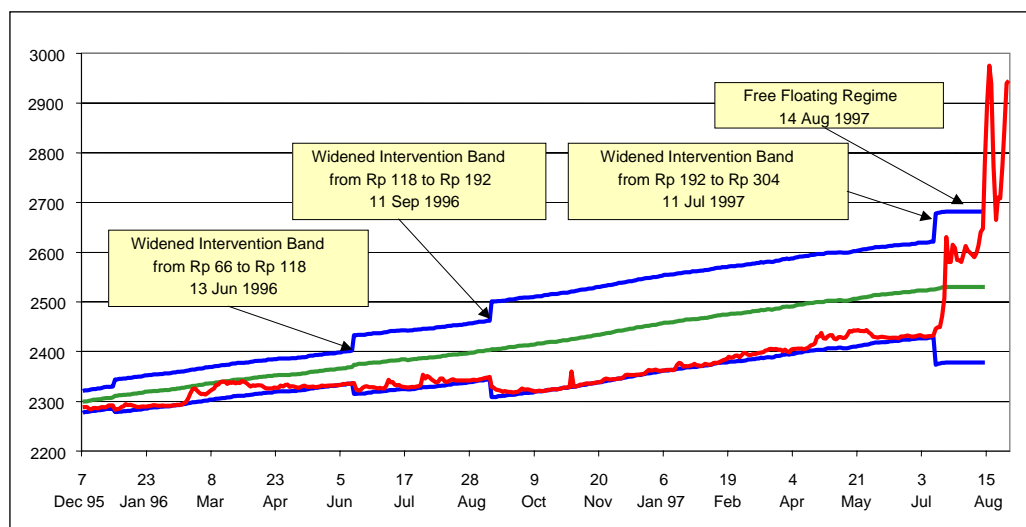
As an initial response taken in consultation with the IMF, Indonesia replaced the intervention band with a free floating exchange rate in August 1997. Under the new regime, market forces freely determined the rupiah exchange rate while the authorities influenced the market indirectly through fiscal and monetary policy. By switching to this new regime, the central bank hoped to dampen the speculative attacks on the rupiah as well as to obtain a stronger hold on domestic monetary developments. The opposite occurred as the rupiah's decline rapidly accelerated, as shown in Graph 1.

Although the crisis originated in an over-leveraged corporate sector and a banking sector that had mismatched assets and liabilities, the liquidity crunch that Asian borrowers faced after July 1997 quickly spun out of control, as heightened political and social tensions overwhelmed economic fundamentals. Our experience suggests that in a liberal financial system, financial markets can be subject to self-fulfilling panics, especially in the presence of highly leveraged positions. In a segmented and thinly traded foreign exchange market, exchange rate movements are extremely reactive to any change in sentiment - especially negative changes - and are subject to manipulation and herd behaviour. Although the rupiah was probably overvalued in mid-1997, the subsequent excessive overshooting and extreme volatility cannot be explained by the domestic macroeconomic situation.

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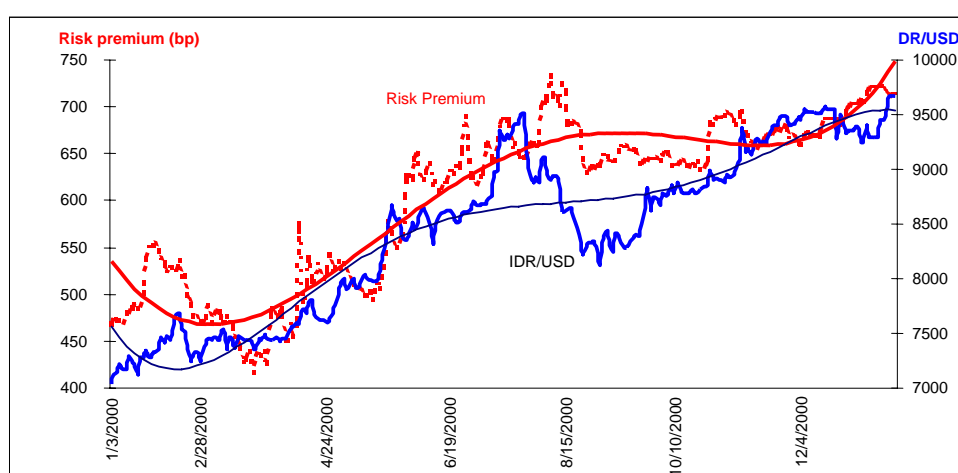
² Internationalisation of the rupiah in general can be defined as the use of the rupiah in international transactions, including trade (export or import), investment and financial market operations.

Graph 1
Managed floating to free
floating exchange rate



At the time of the crisis, investors' sentiment turned negative as reflected in the risk premium - the spread of the Indonesian Yankee bond over the comparable US Treasury note. The internationalisation of the rupiah provided an opportunity for non-residents to take advantage of this loss of confidence and to speculate in the offshore rupiah market. Speculative activity in the rupiah intensified amid the lack of social and political stability in Indonesia. This caused excessive exchange rate volatility and made it difficult for monetary policy to maintain the stability of the rupiah, which had a negative impact on the overall macroeconomic situation. The weakening rupiah harmed macroeconomic stability through the pass-through impact on inflation, which led to higher interest rates than optimal to support economic and financial stability. Depreciation also affected the fiscal deficit, by raising the cost of external debt service as the rupiah value of the debt stock exploded.

Graph 2
The movement of rupiah and risk premium



Weakness in the currency persisted well after the initial panic subsided. During the first three years of the floating exchange rate system, the volatility of the rupiah remained high compared to other Asian countries, as illustrated in Table 1.

Table 1
Exchange rate volatility: 1995-2000

	1995	1996	1997	1998	1999	2000
A. Daily volatility¹						
Indonesia	0.15	0.15	2.49	4.86	1.88	1.05
Korea	0.25	0.23	2.65	1.75	0.48	0.42
Philippines	0.28	0.05	1.31	1.19	0.45	0.58
Thailand	0.12	0.08	1.71	1.58	0.56	0.45
Malaysia	0.23	0.15	0.90	1.75	0.01	0.01
B. Monthly volatility²						
Indonesia	0.51	0.65	11.25	32.66	10.25	3.85
Korea	1.06	0.93	10.06	7.49	2.86	2.44
Philippines	1.50	0.09	5.09	4.85	1.83	3.44
Thailand	0.59	0.34	8.45	8.93	3.08	2.18
Malaysia	1.06	0.61	4.48	7.21	0.01	0.01

¹ Standard deviation from percentage changes of daily exchange rate. ² Standard deviation from percentage changes of monthly exchange rate.

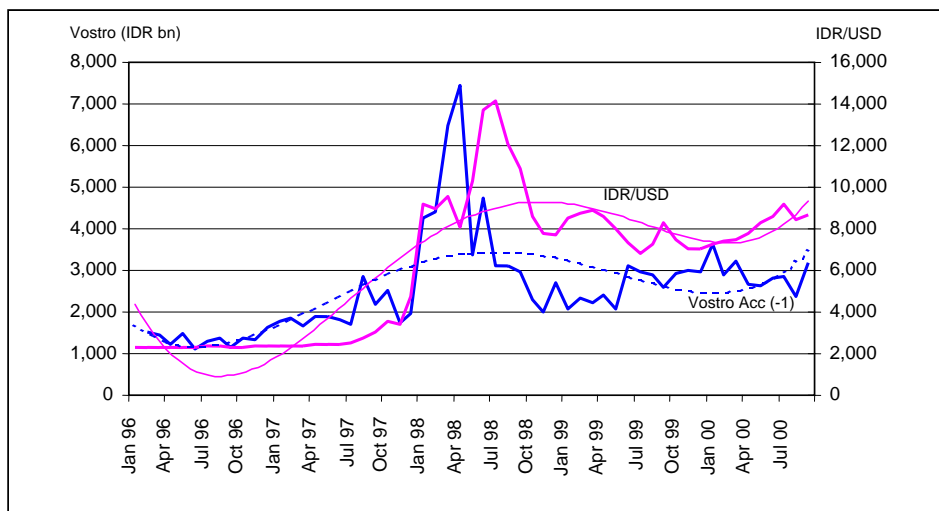
Source: IMF Working Paper 01/152.

The negative impact of internationalisation of the domestic currency

The internationalisation of the rupiah allowed non-residents to play a large role in deciding the direction of the exchange rate as their activity was followed by traders in the local market. It is difficult to know the exact amount of offshore rupiah because this is beyond Bank Indonesia's jurisdiction. However, rupiah transactions by non-residents, and their role in affecting of the direction of the exchange rate, could be traced through their vostro accounts with onshore banks. Activity in these accounts tended to be high and volume increased during periods when the exchange rate was under heavy pressure as shown in Graph 3. Rupiah speculation by non-residents was made possible because of the relatively easy access to rupiah from onshore banks. In addition, ample liquidity in the domestic financial market was available since loan demand had dried up. With investment opportunities still limited, investing in the foreign exchange market was one attractive alternative for banks with excess liquidity.

The disparity between the volatility of the rupiah and the currencies of Asian countries that had taken measures to limit the internationalisation of their currencies led Bank Indonesia to evaluate existing regulations governing rupiah transactions with non-residents. Bank Indonesia determined that the offshore market for rupiah had induced greater volatility in capital flows and exchange rate movements. At times it had also complicated the efforts of Bank Indonesia to control the money supply.

Graph 3
**Fluctuation in vostro account
vs IDR/USD exchange rate**



Bank Indonesia regulation

Because of these problems, it was deemed necessary to have a policy that would minimise the opportunity for non-residents to speculate against the rupiah. Therefore, Bank Indonesia issued Regulation no 3/3/2001 on 12 January 2001, which limited rupiah transactions between onshore banks and non-residents.

To this end, we designed policies to reduce the volatility of the rupiah exchange rate that originated from foreign exchange trading without underlying economic transactions, while maintaining our commitment to a free foreign exchange regime. The opportunity of non-residents to speculate on the rupiah would be curtailed through the limitation in accessing credits from the domestic banking system. Therefore, Bank Indonesia issued a regulation restricting rupiah transactions and foreign currency credit offered by banks to non-residents. The regulation consisted of two major parts, namely restrictions on certain transactions by banks with non-residents without any exception and limitations on derivative transactions with non-residents, with some exceptions.

The coverage of the regulation is as follows:

1. Prohibits banks from extending loans and providing other sources of rupiah funding to non-residents including:
 - Rupiah and foreign exchange loans to non-residents, including intraday overdrafts;
 - Placement of rupiah in the form of deposits or other means in offshore banks;
 - Investment in rupiah-denominated assets issued by non-residents;
 - Inter-office transactions in rupiah (domestic branch lending to offshore branches);
 - Equity participation in rupiah by non-residents.
2. Restricts banks from conducting derivative transactions without underlying transactions. Restricted derivative transactions encompass:
 - Forward sales, including next day and spot currency transactions rolled over as synthetic transactions replicating foreign currency forward sales;
 - Swap sales including overnight and next day swaps;
 - Transactions involving the selling of foreign currency puts against the rupiah.

3. Prohibits banks from transferring rupiah to non-residents without underlying economic activities in Indonesia.
- Transferring rupiah from residents to non-residents is prohibited, except:
 - Settlement of forex buying against the rupiah;
 - Settlement on NR accounts with onshore banks related to domestic economic activities such as equity participation, securities transactions, foreign debt repayment in rupiah, import L/Cs in rupiah, goods and services purchased in Indonesia, and NR living costs in Indonesia.
 - Transferring rupiah from non-residents to non-residents is prohibited, except:
 - Settlement of forex transactions;
 - Settlement on NR accounts with onshore banks related to domestic economic activities such as equity participation, securities transactions, goods and services purchased in Indonesia, and NR living costs in Indonesia.

Evaluation

We recognised that these restrictions did not automatically contain exchange rate fluctuations. There are many factors, including non-economic factors, that affect the value of the rupiah. As in most segmented and thin markets, the rupiah exchange rate is largely event driven. The social and political turmoil experienced during 2001 contributed heavily to the difficulty of measuring the effectiveness of Bank Indonesia's regulations in reducing the rupiah exchange rate volatility. Nevertheless, the evidence of the exchange rate volatility during the first two months after the introduction of this regulation showed some encouraging results. The rupiah's volatility fell from an average of 2.2% in 2000 to 0.8% and 0.9% in January and February 2001, respectively, while the average balances of daily vostro accounts also fell substantially from Rp531.6 billion before the regulation to Rp88.6 billion after its issuance or less than 20% of its previous average balance.

Reviews of the regulation's effectiveness have been conducted regularly since its implementation. Hence, some areas will be subject to further improvement. One major objection to the regulation has been the impact in curbing access to the rupiah for hedging purposes, especially to cover unrealised investments. Under the existing regulation, investors who have already signed an agreement to invest but have not executed the transaction are banned from hedging facilities, as no underlying transaction has been executed. Therefore, one proposal for improvement includes the extension of the coverage of derivative transactions for hedging purposes under the above circumstances and a better definition on technical issues, such as the definition of credit, sanctions, as well as the clarification of several operational issues.

Concluding remarks

Limiting the availability of the rupiah to non-residents is not the only answer to achieve stability of the rupiah exchange rate. Many factors contribute to the fluctuation of the rupiah. The Indonesian foreign exchange market is volatile not only because of its structure but also due to political and macroeconomic developments. Nevertheless, with the current regulation, we have minimised the opportunities to undertake speculative activities by taking advantage of non-economic factors so that the rupiah exchange rate will more closely reflect economic fundamentals, thereby easing the task of Bank Indonesia, the central bank.

Globalisation and its effects on monetary policy: the case of Israel

Meir Sokoler¹

Introduction

During the last decade the forces of global economic integration have profoundly changed Israel's economy. Globalisation, together with large-scale immigration that consisted largely of technically highly skilled immigrants from the former USSR, caused a structural change in the country's economy by significantly increasing the importance of the high-tech export sector (Graph 1). This has not only increased the country's dependence on the state of the global real economy, but has also raised the sensitivity of its economy to developments in financial markets, especially in the United States.

Globalisation has also forced a change in the mindset of politicians and policymakers and made them aware of the following: (a) the importance of financial markets (domestic and foreign) as a disciplining force on policy; (b) the reduced freedom to conduct countercyclical macroeconomic policy even in a severe recession; (c) the importance of an independent central bank; and (d) that the exchange rate could no longer be managed by the authorities. These changes also affected three major aspects of the central bank's monetary policy: (a) its primary objectives; (b) the general framework in which it is carried out; and (c) operating procedures and the response of monetary policy to shocks. This paper will briefly examine how globalisation has affected each of these aspects, stressing the constraints and challenges that they place on the Bank of Israel (BOI) in an era of greater volatility - one of the more important consequences of globalisation.

I. The effect of globalisation on the Bank of Israel's primary objective

Israel has suffered from chronic high inflation throughout much of its history. The need to respond to the pressures of globalisation and the desire to integrate successfully into the global economy made it necessary to reduce inflation to the low levels currently prevailing in many developed and developing countries. Globalisation was also a key factor in the disinflation process in two major ways. First, it precipitated the removal of barriers to free trade in goods and services. This in turn unleashed competitive forces which resulted in lower prices of imports and import substitutes. As argued recently by Rogoff (2003), the competitive pressures not only had a one-off effect of lowering prices, but, through the political economy channel, helped to make monetary policy more effective. Second, globalisation also meant the (gradual) removal of capital controls. As a by-product, the foreign exchange (FX) regimes - initially fixed and then heavily managed - were abandoned in favour of a free float (the BOI has not intervened in the FX market since June 1997). Since the previous FX regime also served as an anchor for prices, a substitute had to be found. This brought about the adoption of inflation targeting as the framework in which monetary policy is conducted, with the primary goal of first reducing inflation and inflation expectations, and then maintaining price stability. The main advantage of inflation targeting is that it provides a transparent framework for monetary policy; it is very useful as a communication tool (Graph 2). The gradual disinflation process involved a long period of high short-term real interest rates (Graph 3). The tight monetary policy stance was very controversial and was opposed by many, including several Ministers of Finance. Those opposed to the policy claimed that it violated the intent of the 1954 Bank of Israel Law which put growth, employment and other goals on an equal footing with price stability. The position of the BOI has been that it is high time to enact a new central bank law explicitly making price stability the central bank's primary objective. However, the Bank maintains that even within the current legal framework it can best

¹ Deputy Governor, Bank of Israel.

contribute to sustainable growth and employment by striving for and maintaining price stability. The main reason that the many challenges to the BOI's monetary policy have been successfully staved off is the disciplining force of financial markets, domestic and foreign, which have grown in importance as a consequence of the liberalisation and deregulation induced by globalisation (see next section).

II. The effect of globalisation on the framework and effectiveness of monetary policy

The process of liberalisation and deregulation of the Israeli economy affected the framework and effectiveness of monetary policy in several important ways. First, Israel's greater dependence on world financial markets increased the pressures for more fiscal responsibility. These forces reduce the dangers of fiscal dominance, thus heightening the effectiveness of monetary policy. Second, globalisation has exposed Israel's economy to a variety of worldwide shocks and has thus increased the challenges faced by monetary policymakers. Third, the forces of globalisation have accelerated the deepening of the domestic financial markets, increasing opportunities for and the effectiveness of risk-sharing and thus increasing the economy's resilience to shocks.

1. The effect of globalisation on the relationship between monetary and fiscal policy

For monetary policy to be effective there must be an appropriate fiscal framework. In particular, as emphasised recently by Woodford (2001) and others, the situation of fiscal dominance must be avoided and monetary dominance must be assured. This essentially means convincing the public that jumps in the price level are not a legitimate solution to the intertemporal government budget constraint (see Liviatan (2003)). Following the ideas of the Maastricht Treaty, Israel enacted a law stipulating that the budget deficit/GDP ratio must move along a declining path. The law has no teeth, however, and the declining path has been changed many times, including the most recent change limiting the growth of government expenditure to 1% per year and the deficit/GDP ratio to 3%. Despite the many breaches of and adjustments to the declining path (Graph 4), the perception of the Israeli public and financial markets - both domestic and foreign - is that the government recognises the importance of fiscal rectitude. This means that the public is confident that there will be a return to a declining trend of the debt/GDP ratio. This ratio declined throughout most of the last decade but has increased in the last few years mostly because of exogenous effects such as the world economic slump and the conflict with the Palestinians (Graph 5 and Figure 1).

The main reason that confidence persists is the public's awareness that the government pays a great deal of attention to how rating agencies and financial markets view fiscal policy. A clear expression of this was the trip to London in 2002 by the Minister of Finance to convince the rating agencies not to downgrade Israel's rating. The government also pays serious attention to Israel's risk premium (Graph 6) and to the yields on long-term government bonds (Graph 7). There is no doubt that the constraining forces that the financial markets and rating agencies exert on policymakers in Israel are the result of globalisation, liberalisation and deregulation.

2. Dealing with external shocks

Globalisation, and especially liberalisation of domestic capital markets, exposes small open economies such as Israel's to worldwide shocks and to contagion effects. These shocks put at risk both price stability and financial stability and pose serious challenges to central banks everywhere. Israel has coped with these challenges by: (a) adopting a fiscal policy framework in which the main goal is to assure the public that fiscal policy is prudent and that it will reduce the government deficit and debts; (b) convincing the public and financial markets that monetary policy is focused on maintaining price stability; and (c) undertaking structural reforms, such as the recent pension reform, to impress upon the public that policymakers are also dealing with the long-term challenges.² As a

² The government recently succeeded in reforming the pension system in Israel; the reform will improve the soundness of the country's pension funds and turn them into serious players in the domestic capital market.

result, despite many negative shocks, nominal stability has been maintained, by and large. Two aspects of this relative stability can be seen in the graphs of (market-based) inflation expectations and the probability of large depreciations of the new shekel (derived from new shekel/dollar FX options; Graphs 8 and 9). This stability should not be taken for granted. Inflation expectations, at any moment in time, are conditional on many variables, including monetary policy. These variables change constantly and the fact that the expectations have remained relatively stable reflects well on the credibility of macroeconomic policy.

3. Deepening the financial markets

The mutually reinforcing pressures of globalisation and deregulation have had a marked effect on the deepening of the financial market in Israel. The greatest effect has been on the FX market, including its various derivatives. The FX market is the country's most mature, with a daily turnover of USD 2,655 billion (Graph 10). Both domestic and foreign entities, including foreign banks, participate in this market. A major reason for the deepening of the FX market is the non-intervention policy of the BOI; the central bank has not intervened in this market since June 1997. As a result it is becoming clear to FX market participants that FX uncertainty is something which banks and the private sector have to deal with by themselves. This policy has led to the rapid growth of hedging instruments such as FX forward contracts and FX options. The notional value of these instruments is 1.5 times the quarterly value of imports plus exports. This means that exporters and importers have the means to hedge against FX uncertainty. A second market which is still developing and growing is the government bond market, with a daily turnover of currently about ILS 705 billion. This market consists of regular as well as CPI-indexed bonds, and yields on government bonds serve as an important benchmark for long-term mortgages as well as long-term investment projects. What is still lacking is a well developed money market.

The deepening of the domestic financial markets has had two important effects on the monetary policy framework. First, financial markets provide important indications regarding the future, which are incorporated in the policy decisions of the BOI. For example, inflation expectations, derived from the difference between the yields on regular and CPI-indexed bonds, are an important input in the monthly interest rate decisions of the central bank. Second, financial markets also serve as an effective two-way communication system between policymakers and the public. By acting in financial markets, the BOI signals its intentions to the public. Equally important, if not more so, is the information transmitted from financial markets to policymakers - both the monetary and fiscal authorities. In this role financial markets serve as a daily vote (backed by money) notifying policymakers how their policies are perceived. Financial markets have thus turned out to be an important guardian against irresponsible macroeconomic policy.

III. Operating procedures and response to shocks

An important outcome of increased economic integration induced by globalisation is that it exposes to competition not only the private sector but also governments and central banks (Wagner and Berger (2002)). This has had several important implications for the operating procedures of the BOI and its reaction to shocks.

First, worldwide developments in goods and financial markets, such as actual and anticipated policy decisions, currently influence the policymaking of the BOI much more than in the past. Thus the interest rate differential, at all maturities, between Israel and the United States is an important variable in the central bank's monthly policy deliberations.

Second, it has become more important to identify external shocks and to determine rapidly whether they warrant a monetary policy response.

Third, financial stability, that is the stability of institutions and markets, is of crucial importance for maintaining public confidence in the actions of the central bank. Thus, ongoing monetary-policy decisions and prudential supervisory issues are more interlinked than before. This means that central banks must pay close attention to how their policy decisions and operating procedures affect financial stability. In Israel this has meant increased importance of interest rate smoothing on the one hand, and fostering the credibility of the BOI's resolve to maintain price stability on the other. Given Israel's

history of high inflation and high debt/GDP ratios, this means that the BOI, in its monetary policy decisions, may give less weight to business cycle considerations than might be given in other countries.

Fourth, the degree of immunity of Israel's financial system to external shocks largely depends on the existing risk-sharing capacity. This means the capacity to share risk in the face of various situations: fluctuations in the FX market induced by external events, sudden large changes in domestic interest rates as result of outside forces, etc. The capacity for risk-sharing in Israel has increased as a result both of a fused macroeconomic policy and of microstructural reforms.

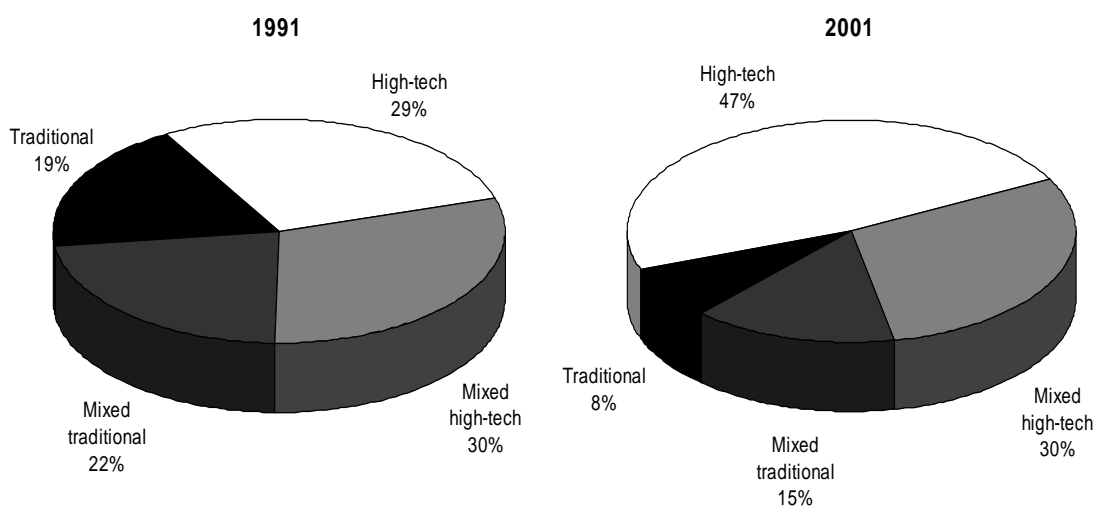
Fifth, the importance of transparency and communication skills has grown in the globalised environment. In this setting, policy should attempt to minimise surprises (in this regard, boredom is bliss!), and it should be conducted with market-type instruments which lend themselves to mark to market valuations.

IV. Conclusion

There can be no doubt that globalisation has been a major cause of an enormous structural change in Israel's economy. This change has also transformed policymaking in the country, including monetary policy. It left no framework for monetary policy other than inflation targeting. This framework was very important in bringing inflation and inflation expectations down to the current low levels. Globalisation created a situation where, in contrast to earlier periods, monetary policy is not dominated by fiscal policy. In the face of globalisation, governments find it increasingly difficult to ignore the verdict of financial markets, which can be very punishing if issues such as large deficits and debts are perceived as being neglected. Finally, globalisation means increased competition not only in the domestic private sector but also for Israeli policymakers. This tends to promote greater efficiency and greater transparency in all facets of policymaking.

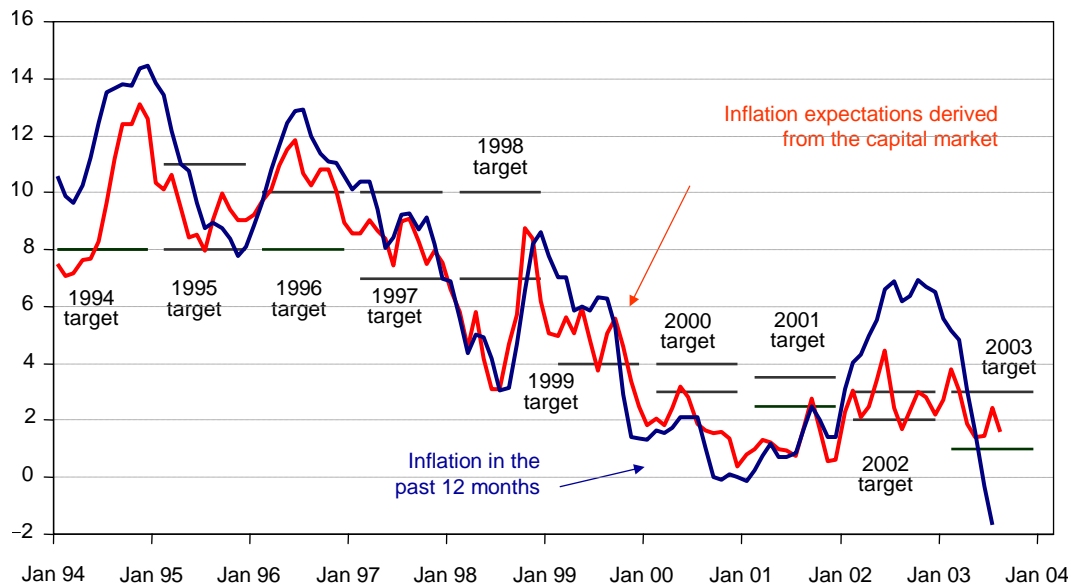
Graph 1

Industrial production according to technological intensity



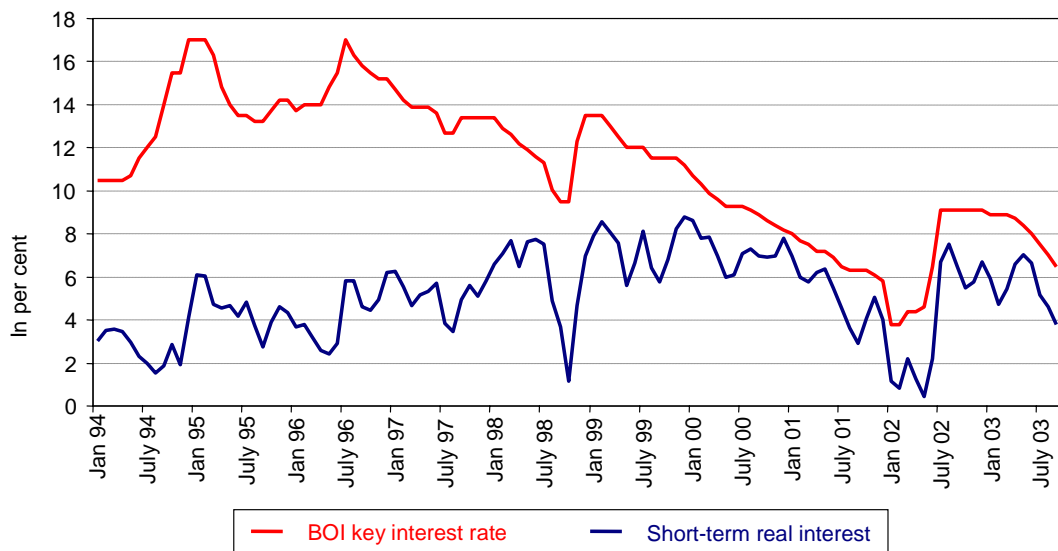
Source: Bank of Israel.

Graph 2
Inflation and inflation expectations



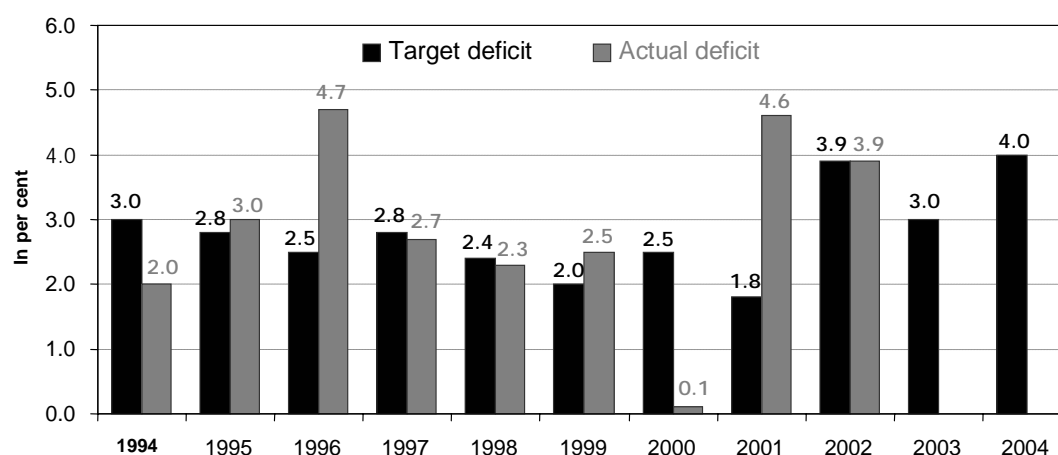
Source: Bank of Israel.

Graph 3
BOI key interest rate and the derived real short-term interest rate



Source: Bank of Israel.

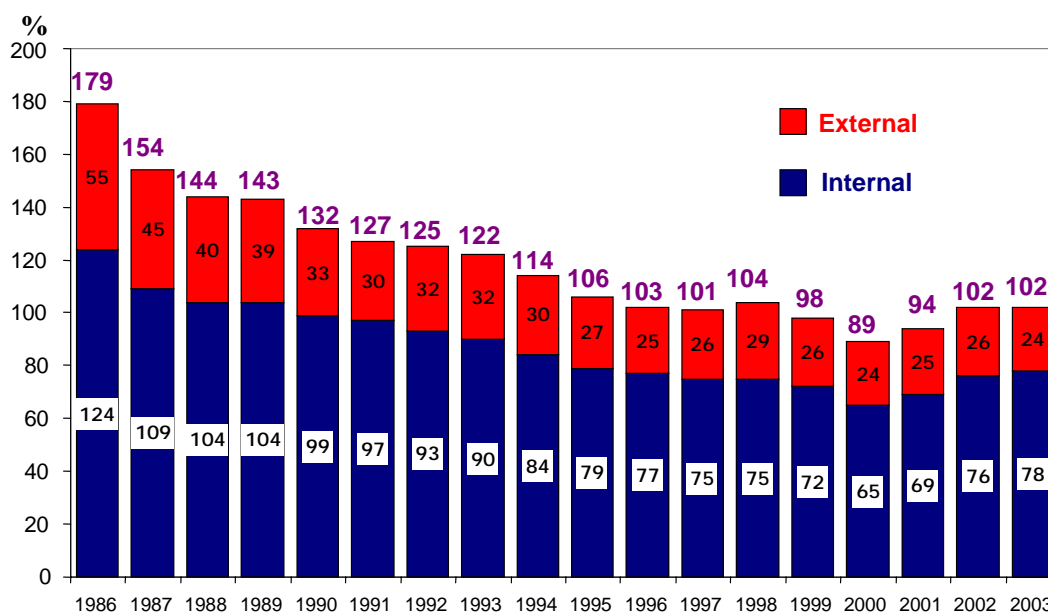
Graph 4
Budget deficits¹
 1994-2004



¹ Until 1996, domestic budget deficit ceiling; in and after 1997, overall deficit including Bank of Israel profit, by law; since 2001, overall budget deficit.

Source: Bank of Israel.

Graph 5
Government debt
 As a percentage of GDP



Source: Bank of Israel.

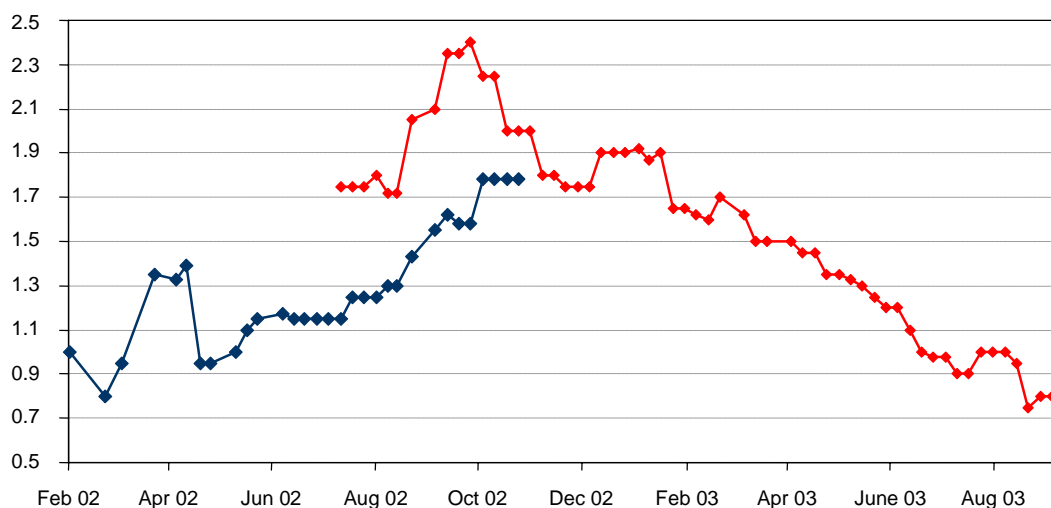
Figure 1

Government debt equation

$$\begin{array}{ccccccc}
 \text{Change in government} & & \text{The primary} & & \text{The long-} & \text{Yearly} & \text{Total} \\
 \text{debt (internal +} & = & \text{deficit to} & + & \text{term real} & \text{GDP} & \text{government debt} \\
 \text{external) to GDP Ratio} & & \text{GDP ratio} & & \text{interest rate} & \text{growth} & \text{to GDP ratio} \\
 & & & & & \text{rate} & \\
 & & & & \underbrace{\hspace{10em}} & & \\
 & & & & \text{Interest payments on the total} & & \\
 & & & & \text{government debt} & & \\
 & \downarrow & & & \downarrow & & \\
 \text{2001 data:} & & & & & & \\
 4.5\% & \approx & -0.86\% & + & 5.2\% & & \\
 \text{2002 data:} & & & & & & \\
 5.7\% & \approx & -0.4\% & + & 6.1\% & &
 \end{array}$$

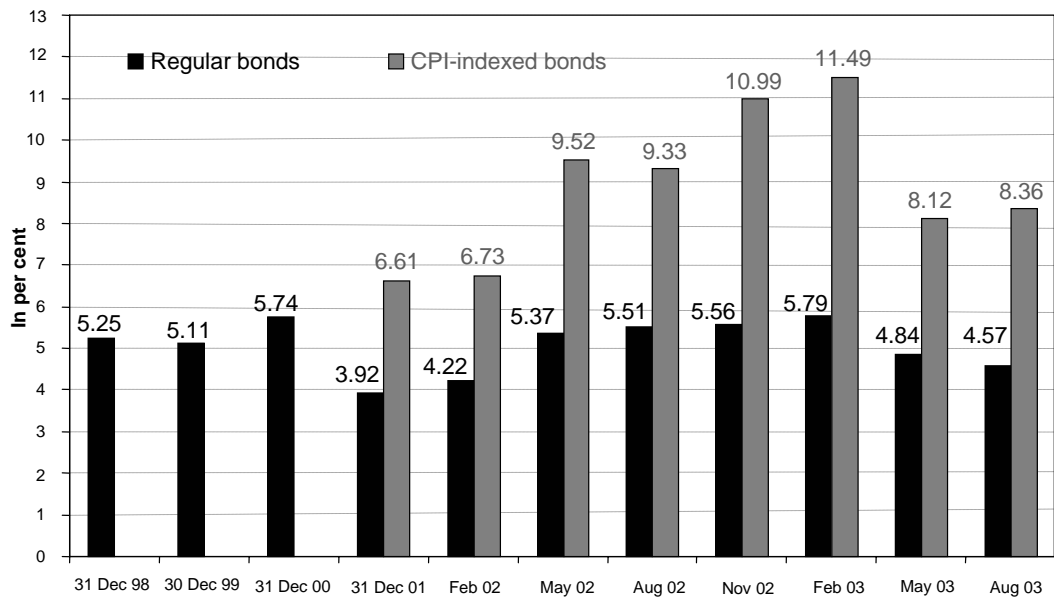
Source: Bank of Israel.

Graph 6

**Israel's risk premium as measured by yield spread¹
and five-year credit default swaps**¹ The spread between yields on five-year government bonds in foreign currency and five-year TSY US Treasuries.

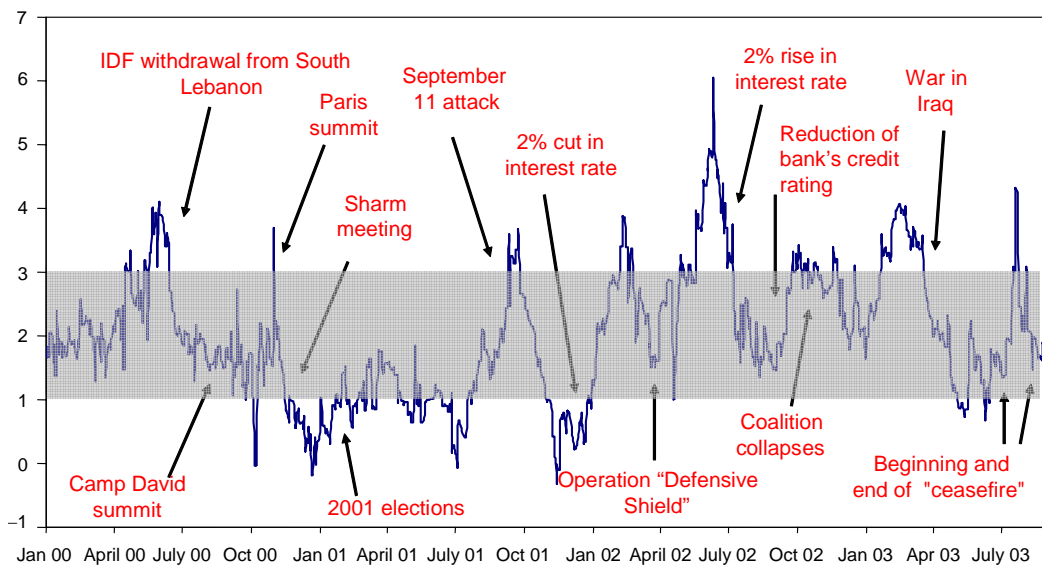
Source: Bank of Israel.

Graph 7
Yield to maturity on regular and CPI-indexed bonds,
10 years to maturity



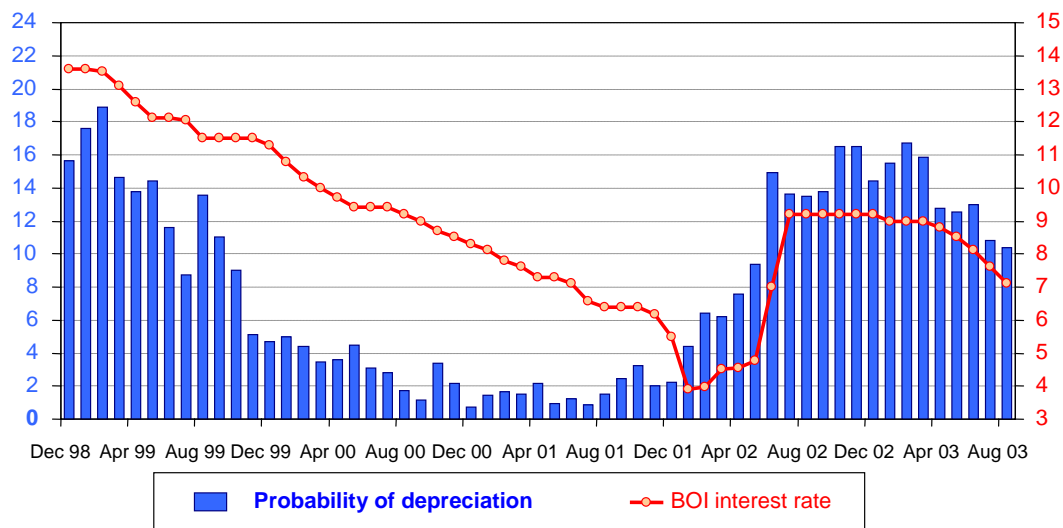
Source: Bank of Israel.

Graph 8
Twelve-month inflation expectations,
economic and political events



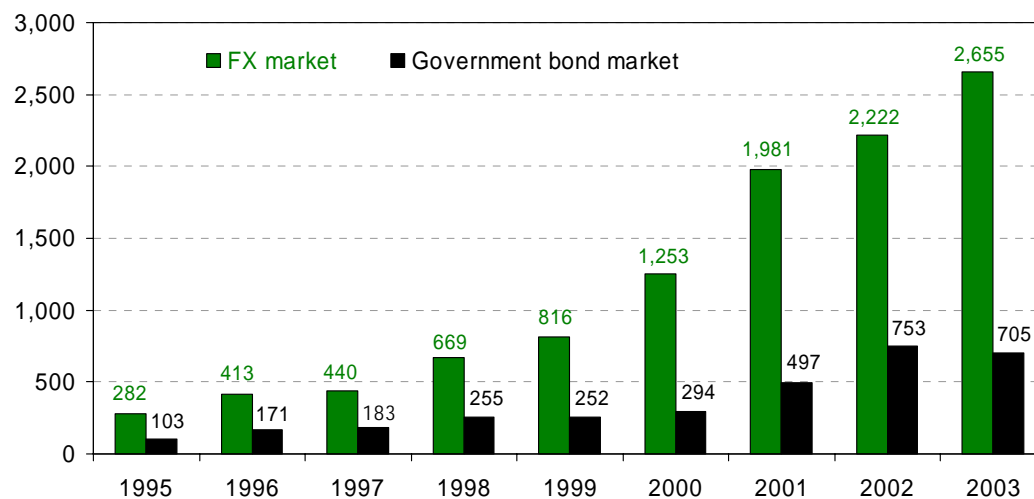
Source: Bank of Israel.

Graph 9
Probability of 10% depreciation and the BOI interest rate
 In per cent



Source: Bank of Israel.

Graph 10
**Average daily turnover in the FX market¹
 and the government bond market²**



¹ In millions of US dollars. ² In millions of new shekels.

Source: Bank of Israel.

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The effects of financial globalization on the Korean financial markets and monetary policy

Kyuyung Chung¹

I. Financial globalization trends in Korea

Due to financial system liberalization and capital flows since the 1990s, Korea has progressed rapidly toward financial globalization, and there has been a large increase in foreign direct investment and other types of capital flows.

Foreign stock investment, which comprises a large proportion of capital flows, has grown significantly. In 1992, when foreigners were allowed to invest in the Korean stock market for the first time, the share of foreign stock holdings in total stock market capitalization was only 4.9%. Subsequently the proportion increased gradually until July 1998, when the Korean stock market was completely opened to foreign investors.² After its complete opening, the proportion increased rapidly to reach 40% at the end of October 2003 (Table 1).

Table 1
Ratio of foreign holdings of domestic stocks and bonds
%

	1992	1994	1996	1997	1998	1999	2000	2001	2002	2003.10
Stocks ¹	4.90	10.19	12.97	14.59	18.61	21.92	30.08	36.62	36.02	40.12
Bonds ²	-	0.04	0.05	0.09	0.30	0.32	0.16	0.09	0.11	0.25
(including foreign banks' domestic branches)		(0.15)	(0.43)	(2.06)	(1.49)	(1.47)	(1.03)	(1.00)	(1.55)	(1.45)

¹ Ratio of foreign stock holdings to total stock market value. ² Ratio of foreign bond holdings to total value of listed bonds; figures inside parentheses represent the ratios of foreigners' bond holdings, including those of branches of foreign banks using their borrowings from their head offices, in the total amount of listed bonds outstanding. (The figures for the bond holdings of foreign bank branches also include holdings of unlisted bonds, but these were on a trifling scale.)

Source: *Foreign Investment Trends*, Financial Supervisory Service.

Meanwhile, the ratio of foreign holdings of listed bonds to the total market value of listed bonds was only 0.25% at the end of October 2003, in spite of the complete opening of the domestic bond market to foreign investors, which took place in July 1998. Even though the share of foreigners' bond holdings (including those of branches of foreign banks investing with funds borrowed from their head offices)³ in total bond holdings showed a general rise, reaching a level of 1.45% of the total as at the end of

¹ Assistant Governor at The Bank of Korea.

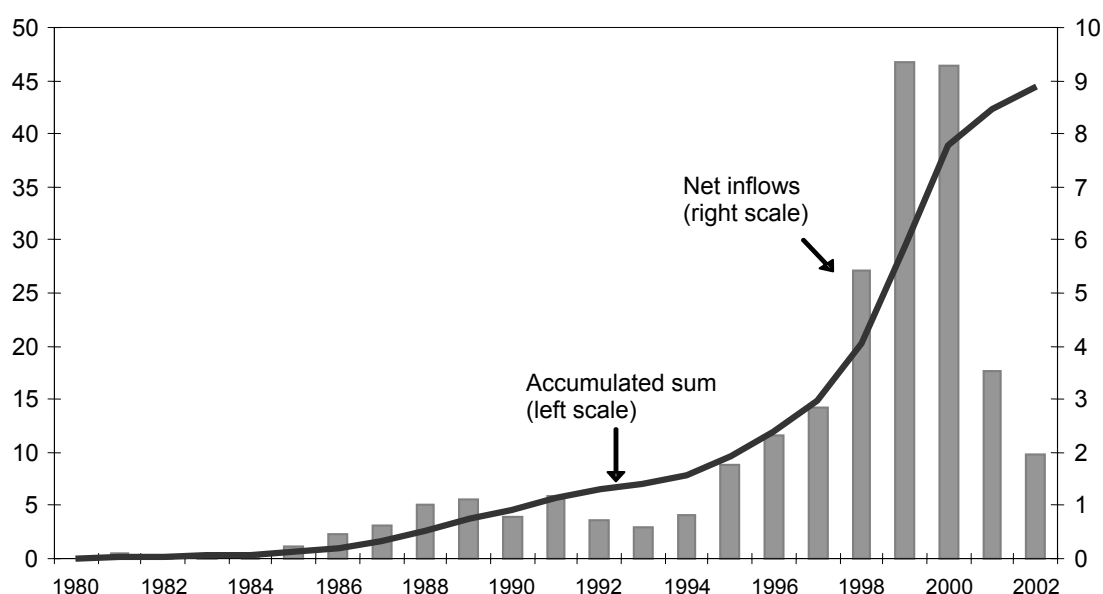
² Foreigners were allowed to invest in the Korea stock market for the first time in January 1992, subject to a ceiling of 10% on each issue and 3% on each investor. The ceilings were raised gradually in eight stages, and in May 1998 they were abolished completely.

³ There is evidence that foreign bank branches tended to invest in domestic bonds when the difference between domestic and foreign market interest rates increased during the first half of 2002. At that time, the difference between these rates increased substantially (from 1.63% (September 2001) to 2.92% (December 2001) and then to 2.97% (June 2002)). And foreign bank branches' borrowing from their head offices soared (from USD 9.9 billion (December 2001) to USD 15.1 billion (June 2002)). Foreign bank branches' investment in domestic government bonds also showed a marked increase (from USD 7.6 billion (December 2001) to USD 12.9 billion (June 2002)).

October 2003, this remained remarkably low as compared to foreigners' share of total stock market capitalization.

As seen in Graph 1, foreign direct investment in Korea increased steadily from the mid 1990s. It rose greatly during the three consecutive years from 1998 to 2000 thanks to corporate restructuring and the reform of the foreign investment system.⁴ Since 2001, however, the net inflow of foreign direct investment has decreased substantially, reflecting the global trend of a contraction of foreign direct investment due to the business downturn in developed countries.⁵

Graph 1
Trends in foreign direct investment
In billions of US dollars



Source: BOP, The Bank of Korea.

From the beginning of the 1990s until the time of the foreign exchange crisis that began in November 1997, foreign entry into the Korean financial sector largely involved the opening of domestic branches

⁴ Main reform measures included the abolition of the mandatory open purchase system in February 1998, which increased the possibility of M&As, the opening of various types of businesses to foreigners in April 1998, and the enactment of the Foreign Investment Promotion Act in November 1998.

⁵ Meanwhile, overseas direct investment (ODI) by domestic residents also increased steadily from the mid-1990s, due to the capital market liberalization and the sharp increases in domestic labor costs and land prices. Since 2001, however, the net outflow of ODI has decreased substantially, reflecting the global trend of a contraction of direct investment.

Trends in overseas direct investment

In billions of US dollars

	1980-90	1991-95	1996	1997	1998	1999	2000	2001	2002	2003.1-3q
Net outflows	0.46 ¹	2.00 ¹	4.67	4.45	4.74	4.20	5.00	2.42	2.67	2.41
Accumulated sum	5.03 ²	15.04 ²	19.70	24.15	28.89	33.09	38.09	40.51	43.19	45.60

¹ Average amounts of net outflows in the periods concerned. ² Accumulated sums at the ends of the periods concerned.

of foreign banks. Foreign entry picked up in 1995-97 in response to the easing of regulations on foreign financial market entry (1994 and 1995). However this dropped off greatly after the foreign exchange crisis. Reflecting this, the equity capital of foreign bank branches, which had grown rapidly for three years straight from 1995 through 1997, declined slightly in 1998 and has still not returned to its year-end 1997 level.

Table 2
Trends in equity capital of foreign bank branches

In billions of Korean won, %

	1992	1993	1994	1995	1996	1997	1998	1999	2000
Capital	546	589	623	1,027	1,392	1,593	1,583	1,515	1,555
(rates of increase)	(33.47)	(7.88)	(5.77)	(64.81)	(35.60)	(14.42)	(-0.63)	(-4.31)	(2.66)

Source: *Monetary Bulletin*, The Bank of Korea.

Meanwhile, in the aftermath of the foreign exchange crisis, there has been a substantial increase in foreign equity participation in domestic financial institutions through greenfield investment and the purchase of failed financial institutions during Korea's financial restructuring. As a consequence, the share of foreign holdings in the equity capital of all listed domestic banks has increased sharply since the crisis (Table 3), from 16.4% at the end of 1997 to 50.2% as of the end of June 2003.

Table 3
Foreign ownership in major domestic banks

Banks (Asset ratio) ¹	At the end of 1997		At the end of June 2003	
	Foreign ownership	Major shareholder and its share	Foreign ownership	Major shareholder and its share
Kookmin Bank ² (30.0)	Kookmin: 25.1 HCB: 41.2	Bank of New York 8.4 Bank of New York 24.4	68.4	Bank of New York 9.4 Goldman Sachs 5.1 ING Bank N.V., Amsterdam 3.9
Korea First Bank (4.6)	0.1	-	48.6	NewBridge Capital 48.6*
Shinhan Bank (10.2)	21.7	-	46.2 ³	Citi Bank 4.6 BNP Paribas 4.0
Korea Exchange Bank (8.5)	2.7	-	77.4 ⁴	Loan Star 51.0* Commerzbank 14.8
Hana Bank (9.1)	21.3	-	26.2	Allianz AG 8.2
Hanmi Bank (6.0)	32.8	Bank of America 18.6*	71.5	KAI(JP Morgan Carlyle) 15.7
Listed banks total	16.4		50.2	

Note: The symbol * means that the foreign shareholders referred to directly participate in management with their management rights.

¹ Figures in parentheses are the ratios of the assets of the banks concerned to all commercial banks at the end of 2002.

² Kookmin Bank and Housing & Commercial Bank (HCB) merged in November 2001. ³ This figure refers to foreign ownership of Shinhan Financial Group - the holding company of Shinhan Bank. ⁴ This figure is based on data as of the end of October 2003.

Source: Korea Investors Service Inc Database.

Table 4
Foreign ownership in major domestic
non-bank financial institutions

%

Securities companies			Insurance companies		
	End of Mar 1997	End of Mar 2003		End of Mar 1997	End of Mar 2003
			Life insurance companies		
Samsung Securities (15.51)	5.10	23.61	Samsung Life Insur (39.21)	0	0.28
			Korea Life Insur (19.35)	0	17.00
LG Investment & Securities (11.16)	11.30	6.76	TongYang Life Insur (2.42)	0	16.57
			Dongbu Life Insur (0.63)	50.00	0
Hyundai Securities (10.00)	0	8.10	Allianz Life Insur ¹ (4.59)	0	100.00*
			Met Life Insur ² (0.91)	51.00	100.00*
Daewoo Securities (9.01)	10.90	7.77	New York Life Insur ³ (0.10)	51.00*	100.00*
			Property & liability insurance companies		
Daishin Securities (6.52)	2.80	26.46	Samsung Fire & Marine Insur (29.89)	20.30	51.62
Shin Young Securities (1.16)	16.0	28.02	Hyundai Marine & Fire Insur (14.07)	0	29.23
			Dongbu Insur (13.26)	16.80	6.45
Bridge Securities (0.76)	1.50	48.11*	LG Insur (12.77)	19.60	4.89
			Oriental Fire & Marine Insur (7.65)	14.30	13.33
Seoul Securities (1.09)	1.30	45.41	First Fire & Marine Insur (4.30)	0	0.47
Listed securities companies total	5.24⁴	15.30	Listed insurance companies total	15.65⁴	40.28

Note: Figures in parentheses show the market share of the relevant company as of the end of March 2003. In the case of securities companies they show the ratio of the relevant securities company's deposits in customers' accounts to total customer account deposits in securities companies; in the case of insurance companies the share of the relevant companies' insurance premiums in total insurance companies' insurance premiums. The symbol * means that the foreign shareholders referred to directly participate in management with their management rights.

¹ In July 1999, Allianz AG took over the First Life Insurance Company. ² In March 1998, Kolon-MetLife Insurance was wholly acquired by MetLife International Holdings, Inc. ³ In March 1999, the equity capital of Kohab New York Life Insurance was wholly acquired by New York Life Insurance. ⁴ Figures are based on data as of the end of December 1997.

Source: Korea Investors Service Inc Database.

In the case of the securities business, foreign entry took the form of the opening of branches from 1991, when the first such branch was established, until the outbreak of the foreign exchange crisis. After the crisis erupted, however, a number of measures were put in place to open up all major aspects of the securities business in May 1998, including the authorization of the establishment of securities companies through greenfield investment and the abolition of the (50%) ceiling on the ratio of foreign investment in existing domestic securities companies. This has led to a sharp increase in the stakes held by foreign-based investment banks and investment funds in domestic securities companies. Reflecting this, at the end of March 2003, foreign equity participation in major domestic securities companies was, with a very few exceptions, generally very much higher than the levels at the end of March 1997 (Table 4). The share of foreign holdings in total equity capital of listed domestic securities companies has increased substantially, from 5.24% at the end of 1997 to 15.3% as of the end of March 2003.

Foreign entry into the domestic life insurance industry mainly took the form of opening of branches and setting up of joint ventures, because domestic life insurance companies' shares are not listed. There was also a remarkable wave of acquisitions of troubled domestic life insurance companies following the foreign exchange crisis.⁶ Consequently, at the end of March 2003, foreign participation in the capital of all the major domestic life insurance companies with the exception of Samsung Life Insurance was much larger than in the pre-crisis period.

Meanwhile, in the non-life insurance sector, foreign entry involved equity participation, rather than the opening of branches. Foreign equity participation in Samsung Fire Insurance and Hyundai Marine Insurance increased substantially. As these companies had high market shares, the result was higher foreign equity participation in casualty life insurance companies as a whole. In line with this, the share of foreign holdings in total equity capital of listed domestic insurance companies substantially increased from nearly 16% at the end of 1997 to around 40% at the end of March 2003.

II. Effects of financial globalization on domestic financial markets and monetary policy

1. Effects of expansion of international capital movements on the domestic financial markets

It is generally recognized that the expansion of international capital movements influences the financial market as a whole by increasing its efficiency and transparency, the volatility of asset prices and the linkages between domestic and foreign price variables.

Turning first to the question of domestic financial market efficiency, the expansion of capital movements accompanying financial liberalization most likely reduces information asymmetry through the improvement of disclosure⁷ as countries seek to conform with international standards. The increased sensitivity of equity prices and exchange rates to market conditions also plays a role. As international capital movements expand, the information efficiency of financial markets can be augmented through the rapid incorporation of market information into price variables such as equity prices and exchange rates. In addition, it is thought that more capital movements raise the efficiency of financial resource allocation. This is because foreign investors largely focus on the economic value of companies, tending to favor sound firms with good future growth prospects. The spillover of foreign banks' advanced techniques also has the effect of improving credit screening in the domestic financial industry as a whole.

⁶ In March 1998, Kolon-MetLife Insurance was wholly acquired by MetLife International Holdings, Inc, in July 1999 the First Life Insurance Company by Allianz AG, and in March 1999 Kohab New York Life Insurance by New York Life Insurance.

⁷ In the case where information asymmetry prevails, the degree of information efficiency can be low as market information is only slowly incorporated into prices. For instance, if an item of information which is a factor increasing stock prices is disclosed only to some investors today and to other investors tomorrow, stock prices rise today as the first group of investors purchases stocks and they rise again tomorrow as the latter group of investors purchases. In this case, the information efficiency of the stock market is low as stock prices respond to the initial information slowly.

If information efficiency is high enough, stock price and exchange rate variables are known to show the characteristics of a random walk.⁸ Jun-il Kim (2000) presented empirical evidence that domestic stock prices and the exchange rate did not show the characteristics of a random walk before the foreign exchange crisis but did so following the crisis in Korea. The rise in information efficiency in Korean markets is seen as being largely caused by the expanded inflows of foreign capital following the opening of the capital markets. Taking another perspective, Sang-in Hwang, In-bae Kim and In-seok Shin (2001) carried out an empirical survey of domestic banks. Their results show that the improved efficiency of financial markets and the enhanced operational efficiency of financial institutions were caused by heightened application of market principles in the domestic financial industry, improvements in the financial infrastructure and the upgrading of the quality of financial services. All of these factors were in large part a response to the increase in foreign banks' equity participation and the expanded market presence of foreign bank branches following capital market opening.

As to transparency, the expansion of international capital movements brings about heightened transparency of domestic financial markets as the domestic financial system is brought into conformity with international standards. Until the foreign exchange crisis in Korea, financial institutions' information disclosure lagged well behind international standards. However, in the aftermath of the foreign exchange crisis, the authorities sought to promote inflows of foreign capital in the process of financial restructuring. In this period, financial institutions' management transparency was greatly augmented due to the upgrading and systemization of information disclosure.⁹

Sang-in Hwang, In-bae Kim and In-seok Shin (2001) conducted a survey of domestic banks using a questionnaire to find out the effect of the expansion of international capital movements on the transparency of domestic financial institutions. A high proportion of responses indicated that transparency had been increased in reaction to foreign financial institutions' participation in the equity of domestic banks and the greater market penetration of branches of foreign banks.

Larger flows of foreign investment funds will generally increase price volatility because prices are more likely to be influenced by temporary disturbances, such as more speculative hot money flows. In order to examine the linkages between the expansion of capital movements and the volatility of financial market prices, we first compare the trends in the unexpected volatility¹⁰ of stock prices (the conditional variance of the rate of change in stock prices) and the increase in the foreign stock investment ceiling. As can be seen in Graph 2, during the period in which foreign stock investment ceilings were being raised, the volatility of stock prices generally rose more than had been anticipated even after taking into account the effects of the heightened volatility of the stock prices resulting from the widening of their daily permissible fluctuation range.¹¹ This leads us to conclude that the expansion of international capital movements acted as a factor intensifying the volatility of stock price movements.

⁸ When information is rapidly incorporated into prices, the levels of stock prices and the exchange rate are decided reflecting all the information that may be acquired at the current time, and the levels of stock prices and the exchange rate at the next moment in time are decided on the basis of new information that becomes known at the next moment so that information at the current point in time does not help predict the change in price variables in the next moment. For this reason changes in these prices show the characteristics of a random walk.

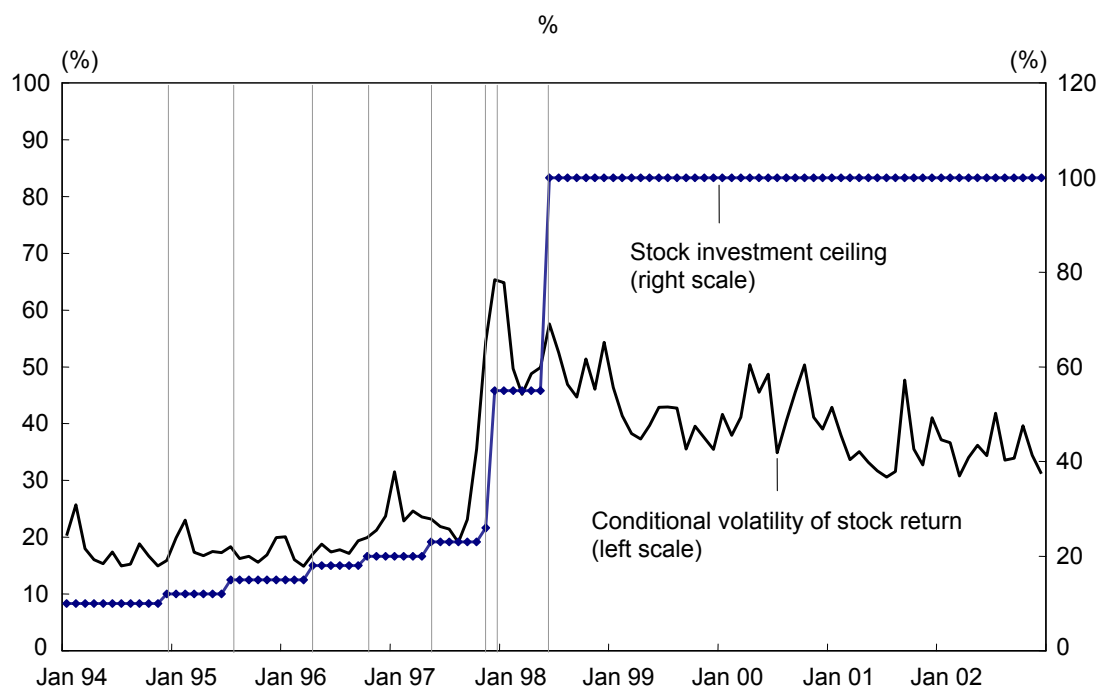
⁹ In the case of banks, a further nine items were added or supplemented on top of the existing 55 items for disclosure related to management performance and financial status in order to bring periodic disclosure up to par with international standards and the level of advanced countries. These additional nine items include the scale of non-performing loans, credit assessment grades, loans to subsidiaries, the status of off-balance sheet transactions including large losses related to financial derivatives, and foreign currency liquidity ratios. In addition, the sanctions against insincere or misleading disclosure were strengthened so that disciplinary steps may now be imposed under the related legislation where full and proper disclosure or re-disclosure is demanded in the event of disclosure not being made in good faith; for example, if important matters are omitted or the materials disclosed are compiled in a misrepresenting manner. In addition the credibility of management disclosure is being heightened by the imposition of the requirement that financial statements be externally audited with closing financial statements receiving a full audit and half yearly interim financial statements being subject to review.

¹⁰ The unexpected volatility of stock prices was calculated using a GARCH (Generalized Auto-Regressive Conditional Heteroskedasticity) model. In the GARCH (1,1) model, the conditional variance equation is affected by the one-period ahead conditional variance (σ_{t-1}^2) and information about volatility observed in the previous period (ε_{t-1}^2).

¹¹ From 1994 until just before the crisis (October 1997) the average conditional volatility stood at 19.45, but for the period from just after the foreign exchange crisis until the end of the year 2002, it registered 41.72, meaning that the volatility of stock prices expanded almost 2.17-fold following the crisis.

We then compared the trends in exchange rate volatility in Korea and the increase in the foreign stock investment ceiling. In contrast to the pre-crisis period, the volatility of the exchange rate increased more than had been expected when the ceilings on foreigners' stock purchases were greatly raised following the foreign exchange crisis, even taking account of the increase in exchange rate volatility resulting from the widening of its daily permissible fluctuation range (refer to Graph 3).¹²

Graph 2
The relation of the investment ceiling on foreigners in the stock market and the volatility of the stock price index



Note: "Conditional volatility of stock return" indicates the monthly average of daily conditional standard deviations (σ_t) of the rates of change in the stock price index (KOSPI).

In order to determine whether there is in fact one-way causality running from the expansion of capital movements to the volatility of domestic stock prices and the exchange rate, we examine the relationship between the international capital movements and the rate of changes of domestic stock prices or that of the exchange rate. As the proxy variable for international capital movements, we take the weight of foreign stock investment in total market capitalization, and as the proxy variables for the volatility of stock prices and the exchange rate we use the conditional volatility of the rate of changes in stock prices and that in the exchange rate respectively (Graphs 2 and 3). The period for empirical analysis is January 1994 to December 2002, and each variable was log transformed.

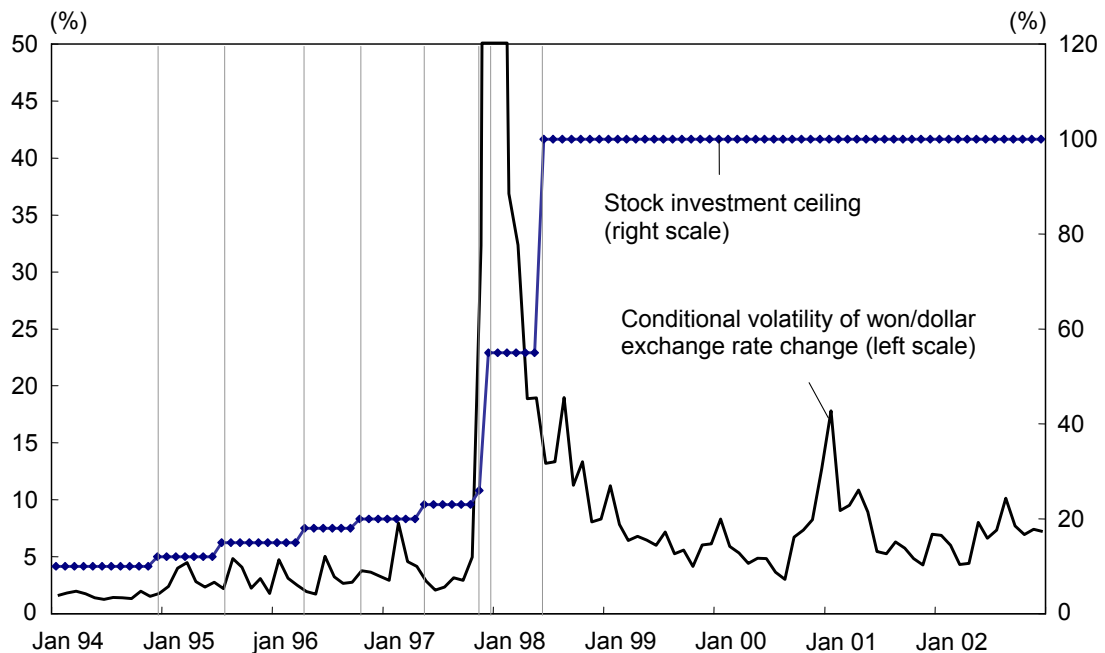
The causality test results also show that an increase in the volatility of stock prices, however, tends to decrease the weight of foreigners' stock investment.¹³

¹² The average value of conditional volatility from 1994 until just before the outbreak of the foreign exchange crisis (November 1997) stood at 2.89. But from just after the outbreak of the foreign exchange crisis until the end of 2002, it registered 11.94, showing a 4.1-fold increase. Meanwhile, even if we exclude the five-month period from just after the outbreak of the crisis (November 1997-March 1998) the average value of conditional volatility registered 8.02, showing a 2.84-fold increase in comparison to the pre-crisis period.

¹³ Refer to Appendix 1 for detailed results.

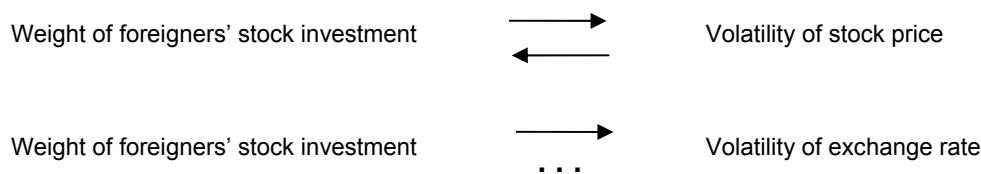
Graph 3

The relation of the investment ceiling on foreigners in the stock market and the volatility of the won-dollar exchange rate



Note: "Conditional volatility of won-dollar exchange rate" indicates the monthly average of daily conditional standard deviations (σ_t) of rates of change in the won-dollar exchange rate.

Results of the causality test



It can be argued that a key price variable in the domestic financial market, such as the stock price or the exchange rate, will be closely linked with the same variable in a foreign financial market when an external shock emanating from that foreign financial market transmits quickly to the domestic financial market. The speed of transmission to the domestic financial market is more likely to increase as a result of the expansion of international capital flows in the ongoing process of financial globalization. Quicker transmission appears to be driven in part by the asset management style favored by foreign institutional investors.¹⁴ For risk management purposes, these investors maintain fixed country investment ratios in the course of expanding the global distribution of their assets.

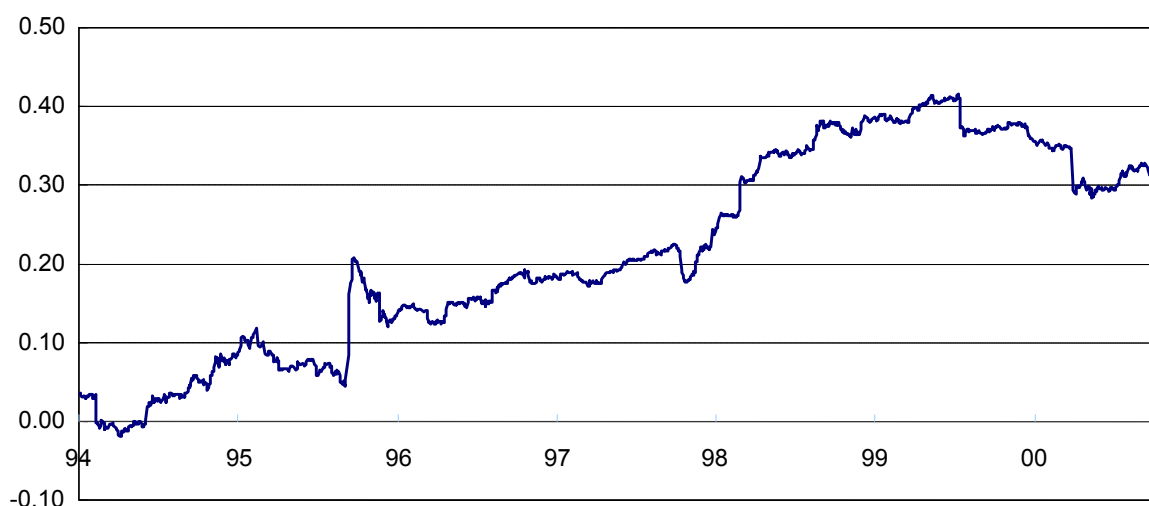
We carried out a brief empirical analysis to determine whether external shocks have tended to be transmitted more quickly to the domestic financial market since the crisis. To this end, we selected the US stock price index (S&P 500) and the yen-dollar exchange rate to proxy for external shock, while using the Korea stock price index (KOSPI) and the won-dollar exchange rate as the price variables in the domestic financial market. Daily data were used and covered the period from January 1994 to the

¹⁴ Investors with a global distribution of investment generally manage their assets, while showing a tendency to maintain a fixed ratio of investment between countries. Accordingly, in the event of a fall in US financial asset prices, the weight of the US investment amount in their investment portfolio will be reduced and Korean financial assets will be sold in order to maintain the fixed ratio of the distribution of investment between countries.

end of 1997 for the pre-crisis period and from January 1998 to September 2003 for the post-crisis period. We found that the daily KOSPI appears not to have depended at all on the daily US stock price over the pre-crisis period. In the post-crisis period, however, the US stock price on one day significantly affects the KOSPI for the following day. Similarly, there is evidence that today's yen-dollar exchange rate significantly influences today's won-dollar exchange rate, in contrast to the results for the pre-crisis period. This evidence may imply that the liberalization measures implemented after the crisis, such as the capital account liberalization and the adoption of the floating exchange rate system, have helped create a more flexible and efficient market environment. As a result, an external shock can now be transmitted to the domestic financial market more quickly than during the pre-crisis period.

To gain additional perspective on changes in the speed of transmission of external shocks, we also calculated the correlation coefficients between price variables in the foreign financial markets and those in the domestic financial market. The evidence generally suggests much quicker transmission. First, the correlation coefficient between US stock prices and domestic stock prices (Graph 4) has increased significantly since the foreign exchange crisis. Second, the linkage appears also to be reflected in the negative correlation between US stock prices and the won-dollar exchange rate, which has emerged since the foreign exchange crisis (Graph 5). As the domestic stock prices are expected to rise when the US stock prices rise, a rise in the US stock prices can stimulate inflows of foreign capital into the domestic stock market, and decrease the won-dollar exchange rate.

Graph 4
**Trends in the correlation coefficient between the rates of change
in US stock prices and those in Korean stock prices**



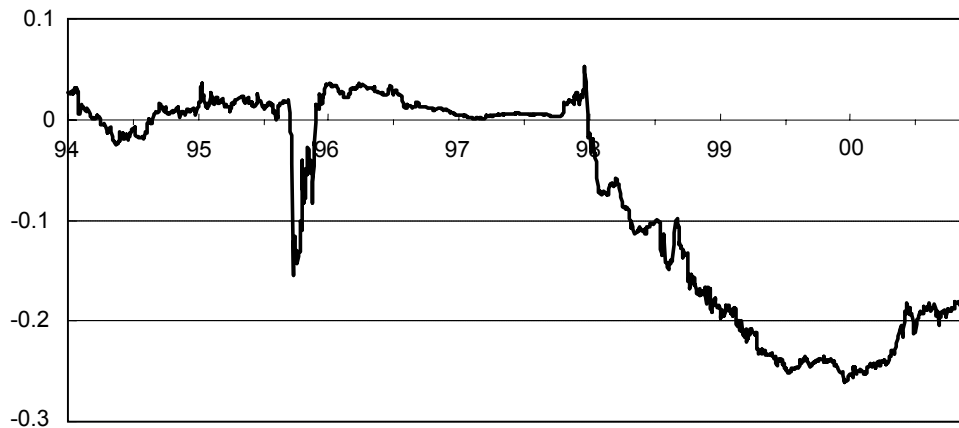
Note: Correlations between the rates of change in US stock prices and those in Korean stock prices are calculated for a period of 500 business days up until year-end 2002 using a method of rollover moving one day forward.

Third, there has been a marked increase in the correlation coefficients between US Treasury rates and Korean government bond rates (with maturities of either three years or five years) since the second half of 1998 (Graph 6). This appears to stem mainly from the brisk arbitrage activities through the bond markets since the complete opening of the domestic bond market in July 1998.

Another feature worth highlighting is that movements of the won and the yen have become more synchronized, as reflected in the rise in correlation coefficients between the levels of the two currencies since the crisis (Graph 7). This seems to have been driven mostly by market expectations that the won will move in tandem with the yen when the latter changes in the foreign exchange market. Such expectations may be closely tied to increased export competition between Korea and Japan, and to the floating exchange rate system introduced in Korea at the end of 1997.

Graph 5

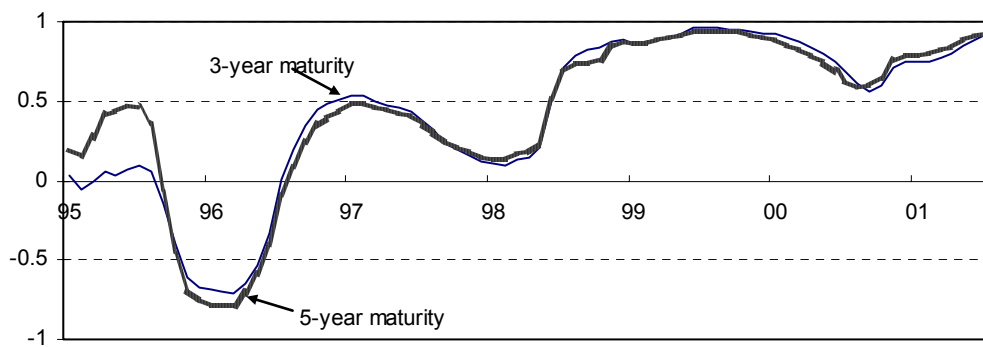
Trends in the correlation coefficient between the rates of change in US stock prices and those in the won-dollar exchange rate



Note: Correlations between the rates of change in US stock prices and those in the won-dollar exchange rate are calculated for a period of 500 business days up until year-end 2002 using a method of rollover moving one day forward.

Graph 6

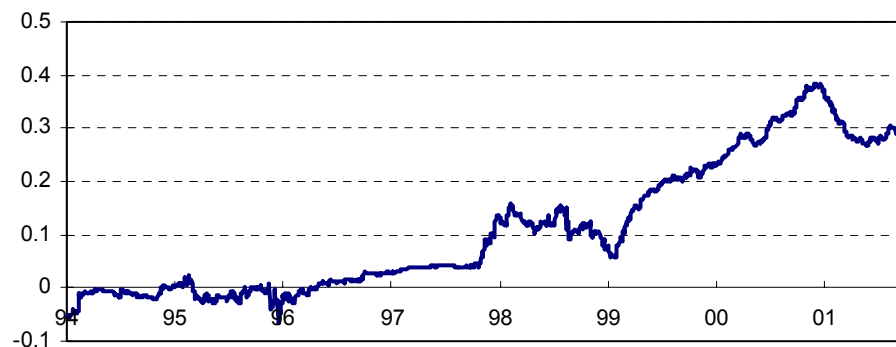
Trends in the correlation coefficient between Korean government bond rates and US Treasury bond rates



Note: Correlations between Korean government bond rates and US Treasury bond rates are calculated for a period of 24 months up until October 2003, using a method of rollover moving one month forward.

Graph 7

Trends in the correlation coefficient between the won-dollar and yen-dollar exchange rates



Note: Correlations between the rates of change in won-dollar exchange rates and those in yen-dollar exchange rates are calculated for a period of 500 business days up until 20 November 2003 using a method of rollover moving one day forward.

2. Effects of an increased proportion of foreign enterprises in the market on the real effects of monetary policy

According to theory on the transmission of monetary policy, an increase in a central bank's policy interest rate, such as its overnight call rate, raises market interest rates, reducing desired investment and consumption with time lags, and finally resulting in a reduction in aggregate demand. The resulting excess aggregate supply is one of the factors which decrease prices through the adjustment of prices and quantities with relatively long time lags. However, in the case where there are many foreign enterprises (including foreign financial institutions), a decrease in domestic credit supply through a policy interest rate hike can lead to increased foreign capital inflows by foreign enterprises. Thus, the reduction in aggregate demand and prices could be smaller in that case, since domestic market interest rates would increase less than they would if the share of foreign enterprises were smaller. By the same token, a larger share of foreign enterprises can reduce the effect of a decrease in the policy interest rate on aggregate demand.

In order to check if an increase in the proportion of foreign enterprises in the market decreases the effect of changes in the central bank's policy interest rate (overnight call rate) on real variables (income, prices and so on), we estimated both an income equation and a price equation using a co-integration model. Most of the estimators of the income equation and the price equation coefficients are significant. The results broadly suggest that, with the expansion of foreign capital investments in domestic enterprises (including financial institutions) by way of shareholdings after the foreign exchange crisis, the effect of call rate changes on income and price levels appears to have declined somewhat (Appendix 2 provides more details).

It is widely recognized that monetary policy indicators (such as the call rate or base money) operate via equilibrium in the asset markets to influence yields and asset prices, and these in turn influence desired consumption and investment spending. It should be noted that international capital mobility has become increasingly important in discussing the monetary transmission mechanism, in the context of the ongoing process of financial globalization. Thus, if the central bank raises its policy interest rate, the differential between domestic and foreign interest rates will rise, leading to foreign capital inflows for investment in domestic bonds. This may in turn lead to an appreciation of the domestic currency. It seems likely that the impact of a rise in domestic interest rates on capital inflows will be even stronger if there is a high portion of foreign enterprises in the domestic market.

Counteracting this effect is the tendency for an increase in the policy interest rate to lower the domestic stock price by raising domestic interest rates. The lowered domestic stock price is then likely to lead to a depreciation in the domestic currency by causing foreign capital outflows, and thus to influence aggregate demand via net exports. Further, a negative wealth effect arising from the decreased domestic stock price may come into play, reducing consumption spending and thus aggregate demand. In this respect, the external value of the domestic currency may fall to a greater extent in the case where the portion of foreign enterprises in the market is greater, because the foreign investment in domestic stocks is likely to shrink further than it would otherwise.

To sum up, an increase in domestic interest rates provoked by a monetary disturbance (ie a hike in the policy interest rate) will tend to result in an appreciation of the domestic currency to the extent that foreign capital inflows are attracted via the domestic bond market, but will tend to have the opposite effect if net foreign capital outflows emanating from reduced foreign investment in domestic stocks occur. As the ratio of foreign holdings in Korea's domestic stock market has increased substantially since the crisis, as shown in Table 1, a hike in the policy interest rate could well lead to a depreciation in the won against the US dollar by increasing foreign capital outflows as foreign investment in domestic stocks declines. Thus, it is possible that the presence domestically of a high proportion of foreign enterprises may dampen the real effects of domestic monetary policy or even reverse them.

3. Experiences in dealing with a sudden stop in foreign capital flows

From the end of 1996, Korea was hit by the deterioration of financial institutions' loan assets as a result of a series of corporate insolvencies (Hanbo, Sammi, Kia, Jinro etc). At that time, the fragility of the corporate and financial sectors emerged as a serious issue. In addition, from around July 1997, there was a sudden stop in foreign capital flows to a number of South East Asian countries including Thailand and Malaysia. Korea was sucked into this vortex through contagion as foreign investors grew increasingly ill at ease with the fragility of the corporate and financial sectors, and began to withdraw their funds from domestic financial institutions from the beginning of the fourth quarter of 1997.

Although the Korean government responded with desperate efforts to increase foreign capital inflows by raising the ceiling on foreign stock investment, early repayment of foreign currency loans taken out by public enterprises, and borrowing of foreign funds through government-run banks, it was nevertheless unable to prevent large scale foreign capital outflows from taking place. The result was the foreign exchange crisis at the end of November 1997. Right after the outbreak of the crisis, Korea received emergency structural financing from the IMF. Overseas capital flowed in for a while during the first half of 1998 as the country's external credit standing was partially rebuilt. From early in the second half of 1998, however, there was again a massive outflow of foreign capital, leading to a net outflow for 1998 as a whole of USD 290 million.

Table 5
Net inflows of portfolio investment
In 100 millions of US dollars

	1995	1996	1997			1998					1999
			3Q	4Q	During a year	1Q	2Q	3Q	4Q	During a year	
Net inflows	138.7	211.8	53.6	-20.9	112.9	25.9	17.3	-37.9	-8.2	-2.9	69.9

Source: BOP, The Bank of Korea.

In response to the sudden stop in capital flows, the government and the central bank took measures to attract foreign capital by improving the soundness of companies and financial institutions, soothing financial markets and liberalizing foreign entry into domestic financial markets. In December 1997, ceilings on foreign investment in corporate, government and public bonds were abolished. This was followed in May 1998 by the abolition of ceilings on foreign investment in stocks. In November 1998, the Foreign Investment Promotion Act, which was principally concerned with tax incentives (tax reductions and exemptions), was enacted. In November 1999 improvements were made in the system for foreign investment in securities so that foreigners were not only able to borrow in domestic markets¹⁵ but were also allowed to engage in over-the-counter sales of stocks acquired through direct investment.

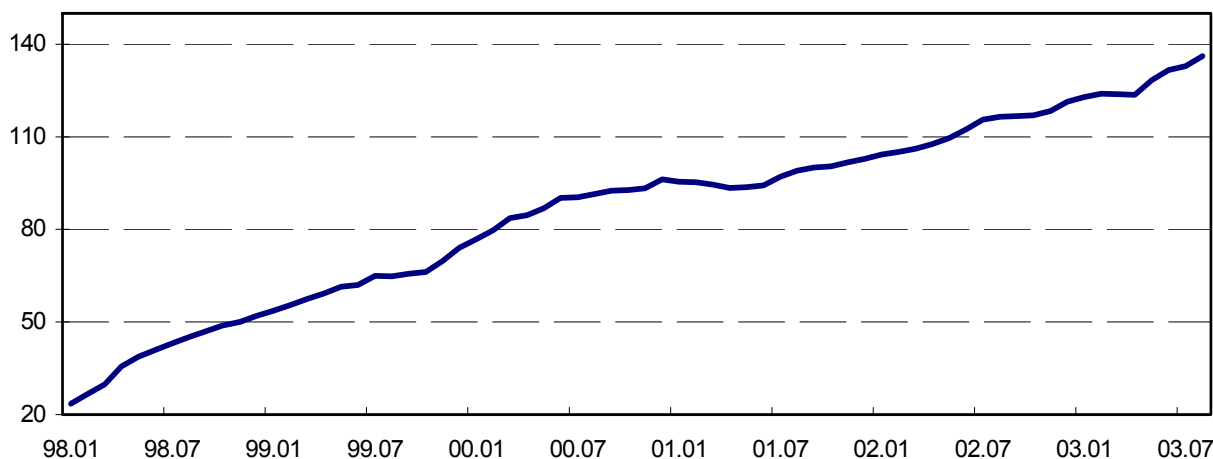
The government also took steps to galvanize the commercial paper and corporate bond markets: in February 1998 it allowed banks to take part in commercial paper operations by way of their bank (and also trust) accounts while giving the green light for large companies to issue corporate bonds (up to three years) until the end of 1998. In March 1998 measures were put in place to avert the failure of otherwise sound enterprises because of liquidity or cash flow problems by arranging joint lending support for them by financial institutions. In April 1998, an agreement with the IMF led to the phased reduction of interest rates in order to ease the credit crunch in the financial markets. In addition, foreign exchange reserves were progressively built up to avoid short-lived speculative attacks involving large scale inflows and outflows of funds and to promote exchange rate stability (Graph 8).

In order to enhance the soundness of the financial sector, in June 1998 the government forced the exit of five of the 15 banks that failed to meet the 8% BIS capital adequacy requirements, while striving to bring a turnaround in the management of 10 other banks by assisting them with public funds and by promoting mergers and acquisitions. Additionally, emphasis was placed on the recovery of corporate soundness through the improvement of corporate governance and financial structures. For the improvement of corporate governance, the election of outside directors was made mandatory in February 1998 and an audit committee system was made obligatory in December 1999. Meanwhile, with a view to a historic improvement of corporate financial structures, major companies with large debts (ie with outstanding bank credits of about 250 billion won) were required to enter into an

¹⁵ In the case of some 20 investment targets including Korea Electric Power Corporation, Dacom, KT, SK Telecom, Korea Gas Corporation, Korean Air Line and so on, foreigners were allowed to take out borrowings from securities companies.

agreement with their major creditor bank for the improvement of their financial structure. The result was an unprecedented improvement in corporate financial structure through debt ratio reductions.

Graph 8
Trends in foreign reserves outstanding
In billions of US dollars



Source: *Monthly Bulletin*, The Bank of Korea.

4. **Effects of increased foreign reserves on the exchange rate and the operation of monetary policy**

In order to assess the effect of an increase in foreign reserves on the level and volatility of the won-dollar exchange rate, we estimated equations in which the yen-dollar exchange rate, the net inflows of foreign stock investment and foreign reserves are the major explanatory variables in determining the won-dollar exchange rate.¹⁶ The relevant coefficients in the estimated equations are all significant. In the case of Korea, an increase in foreign reserves is associated with a fall in the long-run level of the won-dollar exchange rate (appreciation) and a reduction in its volatility.

An increase in foreign reserves can affect the operation of monetary policy by promoting stability in the foreign exchange and domestic financial markets. In other words, it appears likely that an increase in foreign reserves tends to stimulate inflows of foreign capital, because it increases the stability of the exchange rate. In addition, a central bank can adjust its policy interest rate more flexibly thanks to the enhanced stability in the domestic financial market stemming from increased foreign reserves.

There is a particular instance in Korea showing that an increase in foreign reserves can help the stability of the foreign exchange and domestic financial markets. During March 2003, the won-dollar exchange rate rose rapidly (depreciated) as foreign capital inflows declined and there was an increasing expectation that the won would depreciate due to the problem of North Korea's nuclear program (the won depreciated by 5.1%). The Bank of Korea (BOK) intervened in the foreign exchange market, selling US dollars out of its foreign reserves to prevent a rapid won depreciation. Stability in the foreign exchange and domestic financial markets was then restored when the likelihood of a peaceful resolution of the nuclear problem increased and the situation at home and abroad improved. As the BOK had sufficient foreign reserves at that time, it was able to restore stability in the foreign exchange and domestic financial markets, and prevent a speculative attack on the exchange rate from taking place, as had happened just before the Korean foreign exchange crisis.

It has been argued that foreign capital flows tend to take place mostly through the stock market rather than the bond market in Korea, in the sense that the share of foreign stock holdings in total stock

¹⁶ Refer to Appendix 3 for details.

market capitalization has increased substantially since the crisis. In line with this, a recent empirical study by Jung-Kun Oh (2000) shows that a fall in the call rate, one of the factors causing stock prices to rise, turns out to increase foreign capital inflows as foreign stock investment soars. Considering this result, it seems likely that the possibility of capital outflows need not restrain the BOK from decreasing the call rate when necessary. By the same token, capital outflows might occur should the call rate increase. The BOK, however, would not have much need to reduce the extent of the call rate increase due to fear of capital outflows, provided that its foreign reserves were sufficient.

Meanwhile, the issuance of monetary stabilization bonds (MSBs) has increased greatly due to the need to absorb the excess liquidity accompanying increased foreign reserves. This makes it more difficult for the BOK to conduct monetary policy, as payments of interest on MSBs increase.

According to theories of the optimal level of foreign reserves, the level of foreign reserves increases as opportunity costs decrease (as reflected in a narrowing gap between domestic and foreign interest rates), or as the volatility in the balance of payments or in foreign reserves increases. We can therefore expect that when the proportion of foreign assets in a central bank's balance sheet is increasing, domestic interest rates are low or there is a greater need to stabilize the foreign exchange market.

III. Important issues relating to monetary policy

Deepening the liquidity of the government and public bond markets

An urgent task for monetary authorities has been to counter the reduced effectiveness of monetary policy associated with the widespread financial globalization of recent years. This requires more efficient implementation of open market operations by deepening the liquidity of the public bond market. The Korean government has recently pursued a series of measures to achieve this goal. These include the establishment of a fixed schedule for the issuance of public bonds (January 1999), the creation of an inter dealer market on the Korea Securities Exchange (March 1999), the introduction of a primary dealer system for public bonds in which 24 institutions - 12 banks, 11 securities companies and one merchant banking corporation - were designated as primary dealers (July 1999), the creation of a public bond futures market (September 1999), the introduction of the fungible-issue system (May 2000)¹⁷ and the initiation of the issuance of 10-year Treasury bonds so as to diversify the range of maturities (November 2000).

Although the volume of government and public bonds supplied increased after the foreign exchange crisis, it was insufficient for active liquidity management via open market operations by the central bank. As a result, the BOK was forced to greatly expand its issuance of MSBs in order to mop up excess market liquidity. To make long lasting changes in market liquidity, the BOK employs outright sales and purchases (principally sales) of MSBs. To change liquidity temporarily, or on a day to day basis, however, it makes use of repo transactions (purchases and sales under condition of repurchase). A serious side-effect of the large-scale expansion in the volume of MSBs issued was the sharp rise in interest charges on MSBs outstanding. This has acted as a factor weakening the effectiveness of monetary policy.

Market expectations reflected in interest rates and call option prices

According to the expectations hypothesis on the term structure of interest rates, market expectations of future short-term interest rates may be calculated using current long-term and short term interest rates. But generally, actual short-term interest rates do not coincide with calculated future expectations

¹⁷ The system of issuing the same kinds of government bonds by keeping the remaining maturities and interest rates of all government bonds issued during a certain period (three months or six months) the same.

of these rates because of a number of factors including the uncertainty concerning future interest rates, risk aversion, the degree of liquidity of bonds and the effect of taxes.¹⁸

In particular, because of the progress of financial globalization, external factors tend to exercise an increasing influence over domestic financial market price variables. It is possible that the divergence between market expectations of future short-term interest rates and actual realized rates will widen due to the heightened uncertainty about future long term and short term rates. In order to address this possibility we compared the gap between actual rates and market expectations of future short-term interest rates using actual US and Korean interest rate data for the period January 2001 to September 2003. Analysis of the data reveals that in Korea the gap between the actual interest rate observed and the market expectation of the interest rate on the one-year maturity MSB 12 months later averaged 2.04%.¹⁹ In the United States, using interest rates on one-year and two-year Treasury bonds, the interest rate gap reached 2.52%. In addition, the gap between the actual interest rate and the market expectations of the interest rate on one year public bonds 12 months later (using the interest rate on one-year and three-year maturity public bonds) was much lower in Korea (1.81%) than in the United States (2.64%).²⁰ The small interest rate differential suggests that estimated future short-term interest rates forecast actual rates comparatively well in Korea.

Overall expectations concerning future short-term interest rates using long-term and short term interest rates are deemed to be useful as an information variable for monetary policy.

Call option prices generally provide important information concerning market expectations. In the case of Korea, it may be implausible for market expectations to be reflected in options prices for bonds in view of the very small trading volume in the call option market for bonds. In contrast, the call option market for stocks, although not on a par with that in advanced countries, is comparatively well developed. Thus, it is conjectured that market expectations are incorporated in the call option prices in the stock market. Call option prices in the foreign exchange market, even though their trading volume is not large, appear to reflect market expectations to a certain degree, given that the pricing of call options by and large runs ahead of changes in the spot exchange rate.

Relative influence on domestic bond rates of external and internal factors

As financial globalization progresses, the influence of external factors over bond market interest rates and other domestic financial market price variables tends to rise while that of domestic factors tends to fall. In line with this, interest rates on US Treasury and Korean government bonds showed a very high correlation (0.9) in the period October 2000 to September 2003. However, an empirical analysis of the determinants of Korean bond interest rates over this period suggests that not only external factors were important during this period. Korean government bond interest rates were influenced not just by US Treasury bond interest rates but also by domestic factors including the call market rate and the money supply (M1).

The conduct of monetary policy in response to external shocks

There is an ongoing debate on whether an inflation targeting country should ease its monetary policy stance when inflationary pressures weaken as a result of significant appreciation of its currency induced by an external shock. The BOK has implemented a system of inflation targeting whereby it seeks to maintain inflation within a target range whose upper and lower bands are established each

¹⁸ Where the tax on interest income from long-term public bonds is higher (lower) than that from short-term public bonds, holders of long-term public bonds will require a higher (lower) interest compensation resulting in an increase (a decrease) in long term public bond interest rates. Consequently, the gap between expectations concerning the future short term interest rates and actual rates will be widened (narrowed).

¹⁹ Expected future one-year maturity bond interest rates 12 months later are calculated using the relation of (current one-year maturity bond interest rate) \times (interest rate on one-year maturity bond 12 months later) = (current interest rate on two-year maturity bond)².

²⁰ Expected one-year maturity bond interest rates 12 months later are calculated using the relation of (current one-year maturity bond interest rate) \times (interest rate on one-year maturity bond 12 months later) \times (interest rate on one-year maturity bond 24 months later) = (current interest rate on three-year maturity bond)³.

year (at the the end of 2003 this was replaced by an intermediate inflation target system). In the operation of this system, consideration is given not only to the inflation target itself but also to the state of the real economy and financial markets and asset prices. This means that the policy rate may not be adjusted in compliance with the inflation target alone even though actual inflation may deviate from its target level. For example, even when actual inflation is running below its target range, the policy interest rate will not necessarily be adjusted downward if there is a possibility of a real estate or other asset price bubble.

Another factor that may influence monetary policy is exchange rate volatility. Exchange rate stability has not been a principal goal of monetary policy in Korea since the adoption of a floating exchange rate regime at the end of 1997. Nevertheless, if the exchange rate deviates by a relatively large margin from its long-term equilibrium level because of the influence of speculative forces (or other reasons), exchange rate stability may be restored through appropriate policy responses including the adjustment of foreign exchange supply and demand.

The recent financial sector disturbances in certain emerging market countries have raised concerns about whether each country's central bank expanded its liquidity in line with rises in the exchange rate and interest rates. During the 2002 episode of financial instability centering on South American countries, Korean domestic market interest rates and the won-dollar exchange rate generally trended downward. However, the BOK did not expand liquidity by lowering the call rate. Instead, it raised its policy rate by one notch (May 2002) in order to bring the rapid growth of housing loans under control. The effect of financial disturbances in other emerging market countries on Korean financial markets was not so great as to require monetary easing on the part of the BOK. In part this is because the scale of Korean claims on South America is generally not large and the region absorbs a relatively small share of Korea's total exports. Relatively robust Korean macro economic fundamentals (eg ample foreign reserves) also played a part.

Recently there has been growing concern as to whether greater consideration should be given in the conduct of the monetary policy to external or to domestic factors. Looking at the external factors facing Korea of late, the world economy is expected to recover gradually, leading to a continued favorable export environment. In addition, the value of the U.S. dollar will likely continue to fall in the near future, because the US is running a huge current account deficit (about 5% of GDP). Further, international oil prices are more likely to show a downward trend. But the North Korean nuclear issue could be a key factor aggravating the current economic situation.

The BOK is largely concerned with domestic factors because they are more likely to come into play as a drag on the Korean economic recovery. The Korean economy has continued its downward trend (showing low growth rates in the first and second quarters of 2003), mainly due to a rapid contraction of consumption and investment. Since the share of mortgage loans in bank lending remains high, the relationship between the real estate business and the risk faced by banking institutions has become greater. Household debt has risen markedly since the end of 2001, due to increased loans extended by banks and credit card companies in the climate of long-run low interest rates. The number of credit delinquents, which surged during 2002, has continued to increase in 2003.

IV. Monetary policy implications of privatization receipts and operations of state-owned exporters

Monetary policy implications of privatization receipts

The increased integration and globalization of financial markets has exposed private agents and governments to greater international competition. This exposure manifests itself in the movement of capital to countries that offer the highest rate of return. This creates an incentive for the large-scale privatization of government-owned enterprises by increasing the costs of maintaining inefficient and overly regulated market structures. The purpose of privatization is to redeploy assets in the economy from the public sector to the private sector. The privatization proceeds for a group of 20 large emerging market economies have been estimated to average 1.75% of GDP a year, mostly in the first half of 1990s, when many governments embarked on active privatization programs. Since privatization entails an exchange of assets that does not affect the net worth of the government sector, or reduce that of the private sector, privatization proceeds should be treated as financing and not as (tax or other) revenue. Privatization may have important monetary policy implications, but the precise effect

depends on what the government does with the proceeds, and on the modes of the privatization. The following modes of privatization may be considered with a view to identifying their differing implications for monetary policy.

First, privatization can be implemented by selling shares to residents (private sector). The government can choose not to use privatization proceeds to finance additional public expenditure, but instead to reduce the government's indebtedness to the central bank. Then, the initial impact of the privatization operation on the government's account is to reduce its net indebtedness to the central bank - since the proceeds are simply deposited in the Treasury account there - and to decrease its stock of illiquid, real assets. The initial impact of the operation on the private sector is to reduce its holdings of money or near money, and increase its holdings of financial assets (eg shares) at the long end of the maturity spectrum. Domestic interest rates could rise, especially since the private sector has become less liquid. An increase in interest rates, by reducing the market value of the financial assets held by the private sector, would reduce its wealth. This effect can, however, be offset if the government uses the proceeds to purchase public debt held by the private sector, or if the central bank conducts an open market operation. If the government uses the proceeds for government expenditure, the private sector's holdings of money or near money increase, and thus the effect of the initial rise of domestic interest rates can be offset. In this respect, privatization in which shares are sold to residents may have a negligible impact on liquidity and domestic interest rates.

A privatization in which shares are sold to non-residents (foreigners) can have an expansionary effect on monetary aggregates because of the associated capital inflows, resulting in an increase in liquidity and a fall in domestic interest rates. How can the central bank deal with these consequences of privatization-related inflows of foreign capital? In general, conventional monetary policy tools to sterilize the excess foreign exchange inflows are likely to be less effective or have undesirable consequences if applied to very large privatization-related capital inflows. An alternative approach would be to use the privatization proceeds to pay off public sector external debt. This policy automatically redirects the inflows abroad and so limits the impact on the local economy. But a potential disadvantage is that debt repayment may trigger other capital inflows, by signaling an improvement in the investment climate, and thus increase rather than eliminate the need for sterilization.

Second, privatization can be implemented by means of a capital transfer by the government to the private sector (a voucher privatization). In this case, the government's property holdings decline, but its liquid assets do not increase. The private sector, however, enjoys an increase in its wealth. If it can borrow against this wealth, it is likely that market interest rates will rise.

In Korea, government privatization programs have largely involved the non-viable financial institutions that came under government control in the process of the financial sector restructuring following the crisis. Privatization has been implemented by selling shares to both residents and non-residents. For example, two government-owned banks were privatized by selling shares to foreigners. First, Korea First Bank (KFB) was taken over by NewBridge Capital in December 1999 (at 500 billion won). Second, Commerzbank acquired Korea Exchange Bank (KEB) in July 1998 (at 350 billion won), and then Loan Star acquired KEB from Commerzbank in December 2003 (at 175 billion won). Privatization receipts have been used for government debt retirement and government expenditure. However, privatization receipts remained very small relative to GDP (around 0.03% during the period 1998 to 2002) and did not result in large and unpredictable shocks to the market. Thus, it appears that privatization proceeds in Korea did not have a major impact on either monetary aggregates or interest rates.

Monetary policy implications of operations of state-owned exporters

The monetary impact of large revenue streams from commodity and other exports of state owned enterprises would be pronounced if their export earnings became subject to massive swings due to unpredictable changes in commodity prices and world demand. In this case, export earnings can create shocks that affect the domestic exchange rate through a number of channels. For example, if foreign exchange earnings from commodity exports are converted into domestic currency and are spent on non tradables, this can lead to exchange rate appreciation and weaken a country's export competitiveness. Policy makers then face a dilemma; they can let the currency appreciate, or the central bank can buy up the foreign exchange earnings and increase foreign reserves to avoid nominal appreciation. The central bank, however, may have difficulty sterilizing large inflows of excess foreign exchange using conventional monetary tools. Thus, this consideration leads some commodity

(eg oil or other resources) exporting countries to rely on alternative approaches to managing large swings of export earnings, such as export revenue stabilization funds (eg Chile, Venezuela, Mexico and Colombia).

In Korea, aggregate data on the export earnings of government-owned enterprises are not available, but it is conjectured that almost all government-owned enterprises do not rely on export earnings. Thus, there has been no need to establish unconventional policy tools to deal with large swings of foreign exchange earnings such as export earnings stabilization funds or compulsory foreign exchange surrender rules.

Appendix 1: Granger causality test

Test equation

$$y_t = a_0 + \sum_{i=1}^n a_{1,i} y_{t-1} + \sum_{i=1}^n a_{2,i} x_{t-1} + \varepsilon_t$$

* In the case where y_t is the series of the proportion of stock investment by foreigners, the test equation includes a dummy variable which has the value of 1 when the ceiling of stock investment by foreigners is expanded, and 0 otherwise.

Causality test result				
Causality	PSIF ¹ → Stock volatility	PSIF ¹ → ER volatility	Stock volatility → PSIF ¹	ER ² volatility → PSIF ¹
F(n,102-n)	1.84 (0.09)	2.02 (0.06)	2.51 (0.02)	0.63 (0.72)
$\sum_{i=1}^n a_{2,i}$	0.012	0.059	-0.16	-0.03
Number of lags(n)	6	7	6	7

Note: In F(n,df), df represents the degree of freedom and n represents the number of lags of independent variables, which was determined according to the significance of F(n,df). F(n,df) is F-test statistics with the null hypothesis of $a_{2,1} = a_{2,2} = \dots = a_{2,n} = 0$, figures inside parentheses are the level of significance.

¹ PSIF stands for the proportion of stock investment by foreigners. ² ER stands for KRW/USD exchange rate.

Appendix 2: Test concerning the effects of an increased proportion of foreign enterprises in the market on the effects of monetary policy

In order to assess whether an increase in the proportion of foreign enterprises in the market decreases the effect of changes in the central bank's policy interest rate (overnight call rate) on real variables (income, prices and so on), an empirical estimation was carried out with the co-integration equations described below. The estimation period is from January 1992 to July 2003. The logarithm of each series is used for each variable in the estimation equations. The coefficient $a_{2,t}$ in the following estimation equations represents the effect of changes in the call rate on income (or prices), and it could vary if the coefficient b_1 has a significant non-zero value. As a proxy for the proportion of foreign enterprises in the market, the ratio of the value of foreign equity investment (including equity holdings through direct investment) to the total value of equities is used. Results of $b_0 < 0$ and $b_1 > 0$ in the following equations would indicate a decrease in the effect of the policy interest rate on real variables due to an increased proportion of foreign enterprises.

Variables

m_t : real money, er_t : won-dollar exchange rate, R_t : overnight call rate

y_t : real industrial production, p_t : consumer price index (CPI)

θ_t : a proxy variable representing the proportion of foreign enterprises in the market

Estimation equations

$$y_t = a_0 + a_1 t + a_{2,t} R_{t-1} + a_3 m_{t-1} + a_4 er_{t-1} + e_t \quad (\text{Income equation})$$

$$a_{2,t} = b_0 + b_1 \theta_{t-1}$$

$$p_t = a_0 + a_1 t + a_{2,t} R_{t-1} + a_3 m_{t-1} + a_4 er_{t-1} + e_t \quad (\text{Price equation})$$

$$a_{2,t} = b_0 + b_1 \theta_{t-1}$$

The results of the estimation of the co-integration equation show the existence of a stable co-integration relationship between the variables over a long period. In particular, the estimators of the income equation and the price equation coefficients b_0 and b_1 show significant positive and negative values.

Estimation results								
Income equation	b_0	b_1	a_0	a_1	a_3	a_4	Adj R^2	ADF
	-0.718 (-2.16)*	0.268 (2.54)**	12.969 (22.56)**	0.015 (9.43)**	0.006 (0.16)	-0.271 (-9.54)**	0.99	7.49
Price equation	b_0	b_1	a_0	a_1	a_3	a_4	Adj R^2	ADF
	-0.522 (-2.94)**	0.283 (5.03)**	5.236 (16.98)**	0.011 (13.48)**	-0.086 (-3.92)**	-0.002 (-0.19)	0.99	9.66

Notes: Figures in parentheses indicate t-values, and ADF represents the statistics from the Augmented Dickey-Fuller test with the error term. ** significant within 1%, * significant within 5%.

Appendix 3: Test concerning the effects of increased foreign reserves on the exchange rate

In order to assess the effect of an increase in foreign reserves on the level and volatility of the won-dollar exchange rate, an empirical estimation is carried out with a co-integration model and a GARCH model which include the yen-dollar exchange rate, the net inflows of foreign stock investment and foreign reserves as independent variables and the won-dollar exchange rate as the dependent variable. The estimation period is from December 1997 to July 2003, as a fully floating exchange rate system was introduced in Korea in November 1997. The first order difference of the logarithm of each series is used in estimation.

Variables

E_t : KRW/USD exchange rate, FR_t : Foreign Reserves

$E_{J,t}$: JPY/USD exchange rate, SI_t : Net inflows of foreign stock investment

Estimation equation

1. Co-integration model

$$E_t = a_0 + a_1 FR_{t-1} + a_2 E_{J,t} + a_3 SI_{t-1} + \varepsilon_t$$

2. GARCH model

$$\Delta E_t = a_0 + a_1 \Delta E_{t-1} + a_2 \Delta E_{t-2} + a_3 \Delta FR_{t-1} + a_4 \Delta E_{J,t} + a_5 \Delta SI_{t-1} + a_6 \sigma_t^2 + \varepsilon_t \quad (\text{Mean equation})$$

$$\varepsilon_t | \Phi_t \sim N(0, \sigma_t^2)$$

$$\sigma_t^2 = b_0 + b_1 \varepsilon_{t-1}^2 + b_2 \sigma_{t-1}^2 + b_3 \Delta FR_{t-1} + b_4 \Delta E_{J,t} + b_5 \Delta SI_{t-1} \quad (\text{Variance equation})$$

Estimation results

1. Co-integration model

Coefficients	a_0	a_1	a_2	a_3	Adj R ²	ADF
Estimators (t-value)	5.022 (9.41)***	-0.067 (-4.71)***	0.694 (8.71)***	0.033 (1.62)	0.69	-3.82

Notes: ADF represents the statistics from the Augmented Dickey-Fuller test with the error term. Figures in parentheses represent t-values, *** represents significance within 1%, ** within 5%, * within 10%.

2. GARCH model

	a_0	a_1	a_2	a_3	a_4	a_5	a_6
Mean equation	0.009 (1.75)*	0.361 (2.55)**	-0.315 (-2.33)**	-0.498 (-3.73)***	0.338 (3.79)***	0.007 (0.53)	-0.347 (-0.05)
	b_0	b_1	b_2	b_3	b_4	b_5	
Variance equation	0.0002 (1.79)*	0.266 (0.73)	0.622 (2.41)**	-0.005 (-1.80)*	-0.001 (-0.46)	0.0004 (1.53)	

$$R^2 = 0.59, \text{ Adjusted } R^2 = 0.50$$

Notes: Figures in parentheses represent t-values, *** represents significance within 1%, ** within 5%, * within 10%.

The result of the estimation using the co-integration equation shows that the co-integration relationship exists, and thus that a long term stable relationship exists among the variables in the co-integration equation. The result that the estimator of a_1 has a significant negative value implies that an increase in foreign reserves decreases the won-dollar exchange rate (causes Korean won appreciation) in the long term.

The result of estimation with the GARCH model shows that the estimator of b_3 has a significant negative value to some extent, which implies that an increase in foreign reserves in Korea decreases the volatility of the won-dollar exchange rate.

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Globalisation and the operation of monetary policy in Malaysia

Latifah Merican Cheong¹

1. Introduction

Malaysia is a small, trade-dependent economy with a high degree of foreign presence in both the real and financial sectors; globalisation and capital flows have thus had a significant impact on the operation of monetary policy in the country. In the last decade, Malaysia has had quite a varied experience in its monetary policy operations, with the changes in the monetary framework being made mainly in response to global developments. In analysing the challenges to monetary policy, this paper examines the evolution of the monetary policy framework during the period just prior to the Asian crisis and the changes since the crisis, following the shift from a floating exchange rate regime to a pegged exchange rate system. A section also deals with structural reforms, a key success factor in a holistic approach to achieving the objectives of monetary policy to promote growth with price stability. The last section deals with the challenges to monetary policy going forward and the ongoing work to build domestic capacity to manage external risks and reduce vulnerabilities as Malaysia continues to liberalise its financial sector.

2. The period prior to the Asian crisis - shift away from monetary targeting to interest rate targeting

The evolution of the monetary policy framework can be broadly characterised by the following developments:

- The shift in monetary policy strategy from monetary targeting towards interest rate targeting in the mid-1990s; and
- The transitional changes in introducing more market-based monetary policy implementation procedures since the crisis.

Prior to the mid-1990s, the monetary policy strategy had been based on targeting monetary aggregates. This was an internal strategy and was not formally announced to the public. The deployment of this strategy was based on evidence that the monetary aggregates were closely linked to the ultimate objectives of monetary policy. In a correlation test conducted using quarterly data from 1980 to 1992, monetary growth (M3) was shown to be positively and highly correlated with inflation. Given that price stability was the ultimate objective of monetary policy, monetary targeting was seen as a suitable target for policy. During this period, the central bank, Bank Negara Malaysia (BNM) influenced the day-to-day volume of liquidity in the money market, consistent with the monetary growth target. This was to ensure that the supply of liquidity was sufficient to meet the demands of the economy, in line with the Bank's monetary policy objective of price stability.

However, subsequent developments in the economy and financial system during the early 1990s weakened this relationship and highlighted the problems associated with using monetary aggregates as policy targets. In particular, the globalisation of financial markets had altered the money demand function, making the relationship between monetary aggregates and output as well as prices less stable. The large capital inflows in 1992-93, followed by a reversal in the following year, brought to the

¹ A substantial portion of this paper is derived from the Bank Negara Malaysia publication "The Central Bank and the Financial System in Malaysia: A Decade of Change 1989-1999". Nevertheless, the analyses and conclusions of this paper are the sole responsibility of the author (Assistant Governor of Bank Negara Malaysia from October 1996 to November 2004) and do not necessarily reflect the views of Bank Negara Malaysia.

forefront the instability of monetary aggregates as targets. As can be seen in Chart 1, the annual money supply growth, as measured by M3, was extremely volatile during the periods of large capital flows. The large swings in M3 reduced the viability of M3 as an intermediate target.

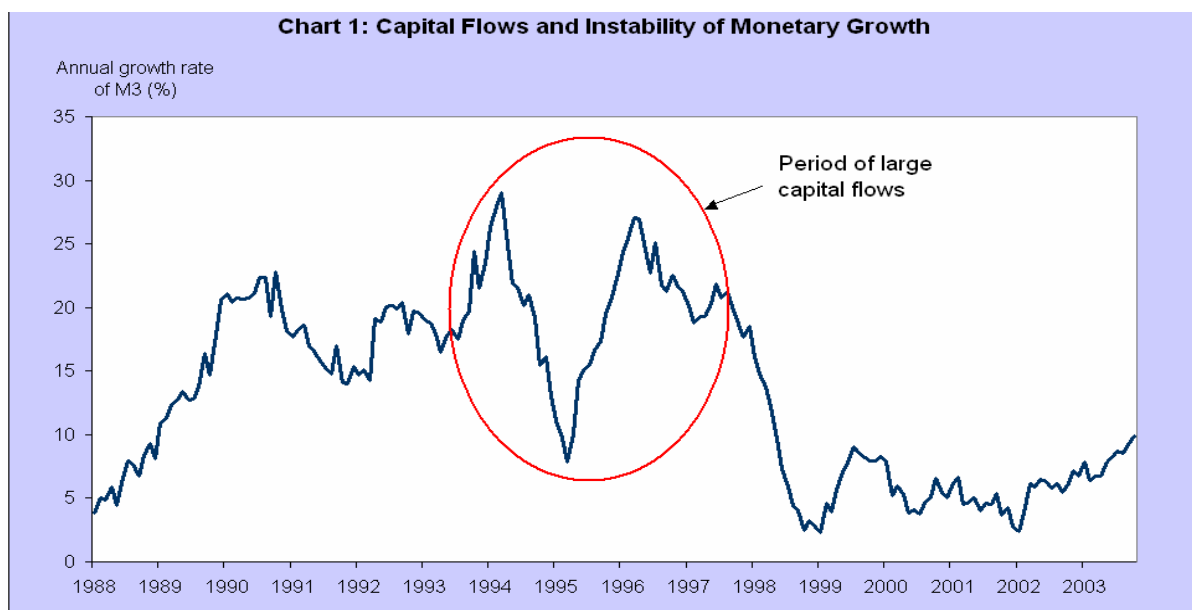
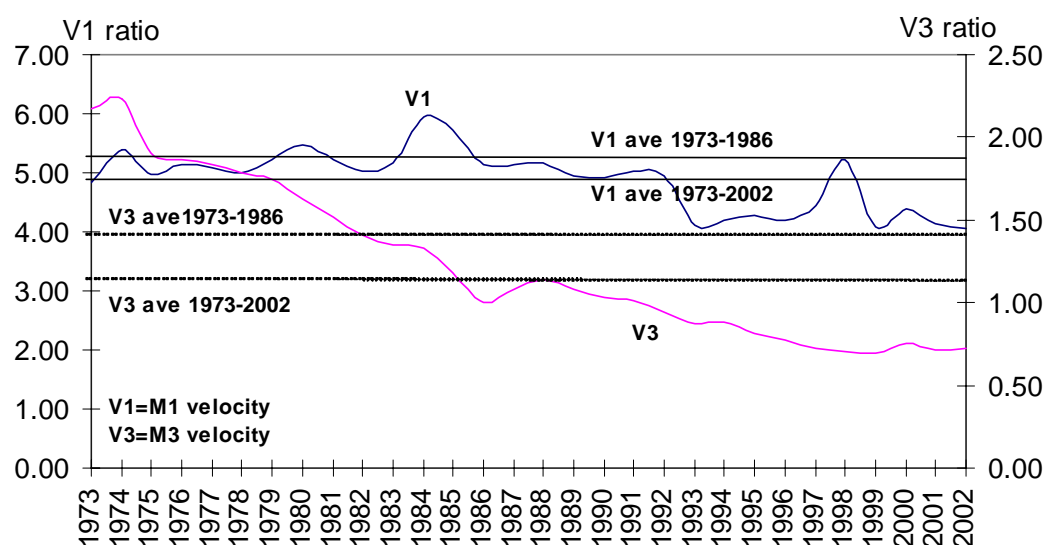


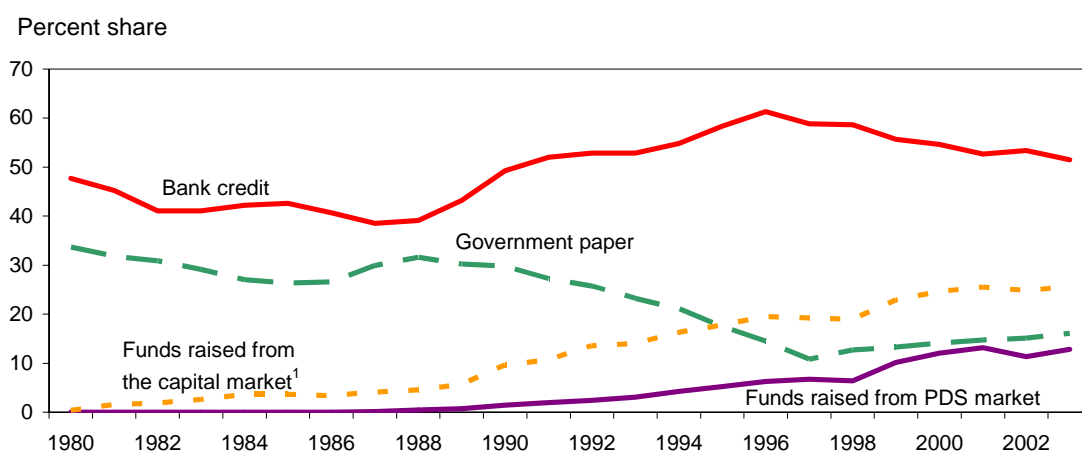
Chart 2 shows that monetary velocities, ratios of nominal GDP to various monetary aggregates, have shown marked departures from their historical patterns since the early 1990s, making the monetary aggregates unreliable as indicators of economic activity and as guides for stabilising prices. Consequently, towards the mid-1990s, BNM shifted its focus from monetary targeting to interest rate targeting. BNM, nevertheless, still monitors very closely monetary aggregates, credit growth and other economic and monetary indicators. These include price developments (including asset prices) and indicators of consumption and investment.

Chart 2
Monetary velocities



In Malaysia, the shift in the monetary policy strategy from monetary aggregates to one in which interest rates were the intermediate target was precipitated by four main considerations. First, the liberalisation of interest rates since 1978 led to a more market-oriented interest rate determination process. Second, financial deregulation and liberalisation measures undertaken during the 1970s had enhanced the role of interest rates in the monetary transmission mechanism. Third, there was a notable shift in the financing pattern of the economy since the mid-1980s following structural changes in the economy from an interest-inelastic market (government securities market) to a more interest-sensitive market (bank credit and capital market). Fourth, as a matter of policy, BNM has maintained positive real rates of return on deposits. The Bank also holds the view that interest rate stability is an important policy variable to promote a stable financial system which will contribute towards a more effective transmission mechanism of monetary policy. Given these developments and an economic environment where investors had become increasingly more interest-sensitive, a monetary framework based on interest rate targeting proved more suitable in meeting the objectives of monetary policy.

Chart 3
Financing of the economy



¹ Both equity and private debt securities markets.

The preference for interest rates over other variables such as reserve money in the conduct of monetary policy had been further reinforced by the globalisation of financial markets and global economic integration. A consequence of financial globalisation is the erosion of autonomy in domestic monetary policy formulation, as domestic policies need to take into account external considerations. Hence, movements in interest rates abroad vis-à-vis domestic rates could no longer be totally ignored in monetary policy implementation. At the same time, globalisation has made it increasingly difficult to forecast the supply of and demand for bank liquidity in the banking system given the volatility of capital flows.

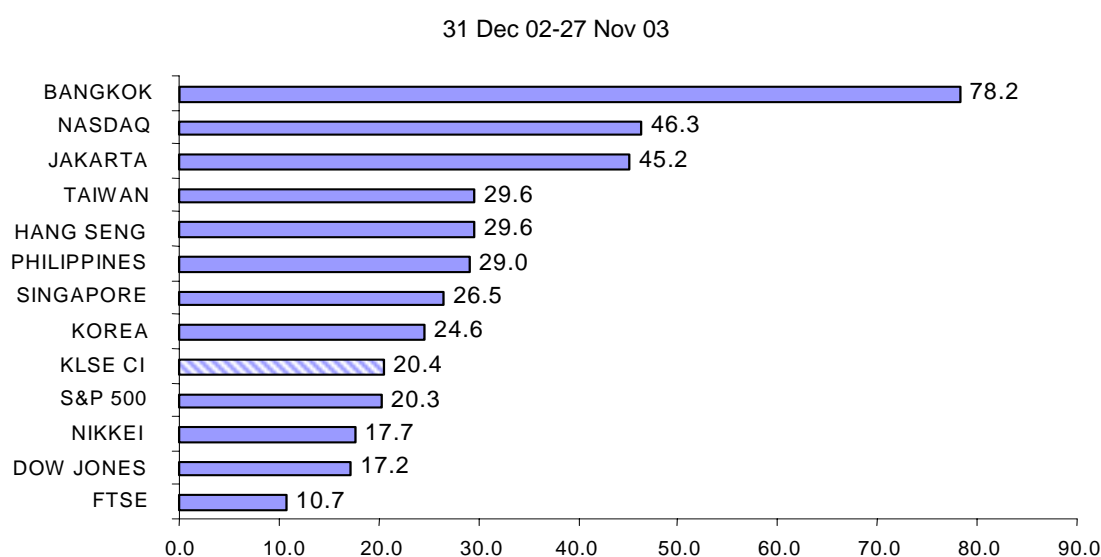
3. Policy response during the Asian crisis

In 1997-98, the ability of BNM to influence domestic interest rates based on domestic considerations had been affected by the volatile short-term capital flows and the excessive volatility of the ringgit during the Asian financial crisis. In 1998, given the risk of large capital outflows due to higher interest rates offered in the offshore market to attract ringgit funds for speculation on the ringgit, BNM was not able to lower interest rates to contain a further contraction in the economy. Amidst the heightened uncertainty during the period, this policy option was itself a potential source of further instability in the foreign exchange market. Under these circumstances, selective exchange controls were introduced on 1 September 1998 and the ringgit exchange rate was fixed at the prevailing market rate on the following day. These measures provided BNM with a greater degree of monetary autonomy in influencing domestic rates to support the economic recovery without having to focus large resources on managing the ringgit exchange rate.

4. Operation of monetary policy with a pegged exchange rate regime

The impossible trinity suggests that it is not possible to have a situation of perfectly mobile capital, monetary independence and a stable exchange rate at the same time. Under the pegged exchange rate, Malaysia has to some extent been able to effect monetary policy based on domestic policy objectives. This has been made possible due to several factors. First, interest rates in Malaysia have not been the main push-pull factor behind the movements of financial flows. The bulk of the reserve accumulation reflects trade flows rather than financial flows. This has largely mitigated the concern over possible sudden reversals of flows that could complicate monetary management. Despite higher domestic interest rates, inflows in search of higher yields were not excessive in 2003. Inflows into ringgit-denominated papers and ringgit external accounts by foreigners account for only 7% of the increase in reserves in January-October 2003. While bank borrowings have a greater correlation with interest rate differentials, such borrowings mainly reflect trade flows. Inflows into non-interest income assets (including equity markets), the main cause of instability in the past, have been manageable.

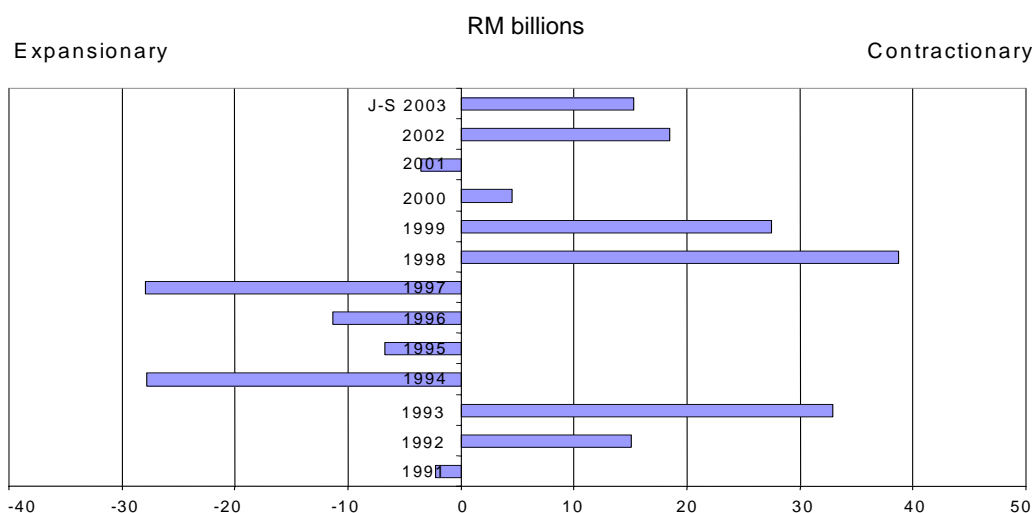
Chart 4
Growth of selected regional stock market indices



This development is the result of putting in place a system of administration of capital flow management that balances the ability of residents to source funds from abroad as well as invest abroad for productive purposes, without causing undue instability in domestic financial markets. The current policy of not allowing transfers among external ringgit accounts (non-internationalisation of the ringgit) also limits the availability of ringgit in offshore markets for speculative positions. This is a major factor in foreclosing the necessity for monetary policy in Malaysia to shadow US monetary policy in spite of pegging the ringgit rate to the US dollar. In other words, a balanced approach in managing flows to support real economic activities without unduly constraining corporate efficiency has contributed to stability in domestic financial markets. This is an important factor in facilitating some independence in influencing interest rates to support domestic growth and price stability objectives.

Since 1998, the management of monetary policy has focused mainly on managing liquidity to maintain interest rates at levels that are sufficiently low to promote economic activity while at the same time, ensuring positive real rates of return to depositors. During this period, liquidity operations by BNM have been largely contractionary to sterilise inflows from the external sector arising from the large trade surplus and to a lesser extent, portfolio inflows. Unlike some emerging economies that have experienced a large accumulation of reserves during this period, net inflows into Malaysia have been relatively moderate, and hence the sterilisation exercise has been manageable. The sterilisation coefficients, estimated at -1.54 , indicate a relatively high degree of sterilisation. Liquidity operations were conducted mainly through direct borrowing from the market and, to some extent, via the issuance of bills. There is also centralisation of deposits of the federal government and a non-bank financial institution with Bank Negara Malaysia, a practice since the 1980s.

Chart 5
BNM Liquidity Operations¹



¹ Direct borrowing & BN bills.

More importantly, the ability for some independence of monetary policy to prevail under the fixed exchange rate regime has been due to the underlying support accorded by achievements in structural reforms. In addition to the reforms in the financial markets, reforms and changes in market practices have been instituted that have resulted in greater flexibility of labour markets and more market-based price determination in both the goods and services sectors.

- (a) In the banking sector, the consolidation and rationalisation exercise through the merger of 54 domestic banking institutions into 10 banking groups has enhanced the operational efficiency and resilience of domestic financial institutions. Ongoing work to prepare the financial sector to compete in a more challenging environment focuses largely on enhancing the capacity of domestic financial institutions. This involves implementing a comprehensive consumer education programme and deepening the risk management and governance framework. Where it benefits the economy in terms of strengthening the financial sector, liberalisation plans have also been brought forward. Three new licences for foreign Islamic banks will be issued.
- (b) In the labour market, to overcome constraints such as wage system rigidity which is determined through collective bargaining or contractual agreements, the implementation of the Productivity-Linked Wage System (PWLS) was encouraged. As a result, during 2000-2002, from a total of 311 collective agreements signed, 167 or 53.5% contained elements of productivity linkages. Increasing acceptance by trade unions and commitment by employers to the PWLS have resulted in greater flexibility in the wage mechanism, determination and implementation.
- (c) More market-based price determination is most visible in the services sector, which has a more direct correlation in influencing the cost of operations and consumer and investor responses to changes in interest rates. The liberalisation of administered prices for essential goods and the deregulation of several industries have resulted in greater competition and, hence, price flexibility. The most significant liberalisation is in the retail petroleum prices, where the subsidy is being gradually removed.

At the same time, measures were also introduced to enhance the effectiveness of monetary policy in the medium to long run, through the implementation of monetary policy procedures that were more market-based. A three-pronged strategy to facilitate this transition process was implemented, comprising: enhancing transparency; improving the payment and settlement arrangements; and accelerating regulatory and prudential reforms.

First, BNM has stepped up its efforts to enhance transparency in the conduct of monetary policy by improving the Bank's communication strategy and enhancing the dissemination of information to the

market. In the wake of rapid developments in the financial sector and the economy, and given the broader-based market participants in the financial markets, the increasing risk of the misperception of monetary and financial policy changes emerged. A significant move towards the effective communication of monetary policy has been the announcement of the monetary policy direction at fixed, predetermined periods. This is a major shift from the previous practice of announcements only at times when there is a policy change. The recent practice of regular monetary policy pronouncements on a quarterly basis creates certainty for investors while enabling BNM to manage expectations.

In addition, BNM has announced the daily liquidity forecast and its daily tender operation results to the public since 1998. Hence, an important channel of policy signalling is through its daily tender operations, with the intervention rate performing a reinforcing role in conveying its policy intention to the market. Prior to this, policy signalling was less explicit, with the Bank conducting its money market operations on a less regular basis and occasionally through money market brokers rather than directly with money market players.

BNM has also placed increasing emphasis on the information content of the conduct of monetary policy and publishes previously undisclosed positions of its money market activities as well as a wide range of other information, including adhering to the templates under the International Monetary Fund's Special Data Dissemination Standard (SDDS). In addition, greater disclosure requirements have been imposed on banks and corporations. BNM has also launched a homepage to provide simultaneous releases of information through the media.

Second, the Bank has taken measures to improve trading, payment and settlement arrangements to reduce the potential problems created by the handling of large volumes of securities, as well as the settlement lags, thereby enabling a larger volume of transactions to be undertaken.

Third, BNM accelerated both regulatory and prudential reforms to foster an environment for sound credit decisions, enhance bank soundness, and improve bank liquidity management. Amongst the measures taken to improve the liquidity management of banking institutions was the introduction of a new liquidity framework, replacing the liquidity requirement imposed on banks. This framework, which is modelled against international best practices on liquidity management, focuses on an efficient matching of the assets and liabilities profile that will enable banks to be better positioned in times of liquidity shocks and allow better utilisation of funds, as well as remove price distortion on liquid assets resulting from the captive demand created under the previous framework.

For the most part, the transition in the monetary policy framework towards a more market-based approach has proceeded at a relatively smooth pace, largely owing to three main factors. First, the existence of a coherent policy strategy between financial sector liberalisation and monetary policy reform. Recognising that financial stability is crucial in the conduct of monetary policy, special emphasis has been placed on policy coordination and measures required to strengthen the effectiveness of monetary policy and to maintain financial stability. Second, the transition towards a more market-based system has been facilitated by the appropriate sequencing of reforms. BNM did not resort to a "big bang" approach in liberalising the financial sector. Liberalisation was only allowed at a pace consistent with the prevailing market conditions and the evolution in the structure of the economy and the financial system. Third, financial discipline and prudent fiscal policy have contributed positively to macroeconomic stability, which has allowed a smooth implementation of financial reforms.

5. Further deregulation of financial markets

Moving forward, the stability accorded by the fixed exchange rate regime provides opportunities to further liberalise regulations. As provided in the Financial Sector Master Plan, a key component of the financial liberalisation process is to move towards a more market-based system in the determination of interest rates. This involves building the capacity of domestic banks in the pricing of loans and strengthening their risk management systems to compete in a more liberalised environment. Liberalising the existing base lending rate (BLR) formula, which guides ceiling lending rates of financial institutions and its linkages to the monetary policy rate, will also necessarily include some changes to the monetary policy framework and procedures. Currently, the BLR provides the guidelines to financial institutions on the ceiling lending rates. The formula itself is linked to the monetary policy rate, a link that was intended to ensure almost immediate pass-through of changes in interest rates directly to lending rates.

Under the current conditions of increasing volatility in financial markets, the fixed exchange rate will continue to provide stability and certainty to facilitate trade and investments. In this regard, the focus of policy continues to be directed at sustaining, and where necessary strengthening, the economic fundamentals to support the sustainability of the exchange rate. In the six years since its introduction, the exchange rate level has remained at fair value with minimum misalignments. This has been achieved through building stronger fundamentals of low inflation, increasing reserves, current account surpluses in the balance of payments, relatively low and largely hedged external debt and a strong banking sector. Further strengthening in fundamentals is being ensured through concerted measures to reduce the fiscal deficit to a balanced position within the next two to three years. An important development in enhancing fundamentals is also the strengthened corporate health and more stringent governance practices, which will further reduce risks to the financial institutions from any adverse external shocks. Continuing the judicious management of capital flows will further allow monetary policy to be based on domestic conditions with stable exchange rates.

The further liberalisation of capital account transactions is an ongoing process. The focus of liberalisation is to reduce the regulatory cost of doing business in Malaysia and to increase efficiency in the management of financial resources, particularly by the corporate sector. Liberalisation to accord greater flexibility to individual investors in the choice of instruments to enhance the returns on savings is also being facilitated. In all these efforts, a primary guiding principle is that changes will not create destabilising conditions in domestic markets. Deregulation and liberalisation will be pragmatic, with the necessary management of the trade-offs between the efficiency of markets and ensuring stable economic and financial conditions.

6. Conclusion

In today's globalised environment, a key precondition for monetary policy to remain effective, in any exchange rate regime, is establishing a track record of credibility. In Malaysia, this credibility is being achieved by adopting a holistic approach to policy formulation. Rather than overburdening one policy tool, policymakers have used a combination of several instruments for more effective results. Policy coordination and an effective machinery to facilitate this coordination are cornerstones of ensuring credibility through the policies achieving their stated objectives. The Malaysian experience has, over time, demonstrated that interest rates as a policy tool can be more effective when working in concert with other complementary policies.

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Policies for international reserve accumulation under a floating exchange rate regime: the experience of Mexico (1995-2003)

José Julián Sidaoui¹

1. Introduction

During the past eight years the Bank of Mexico, has implemented monetary policy under a floating exchange rate regime. The central bank has refrained from discrete interventions in the foreign exchange market and avoided signalling any desired exchange rate level. Nevertheless, an impressive stock of net international reserves has been accumulated throughout this period. This paper deals with the policies of international reserve accumulation adopted by the Mexican financial authorities from 1995 to 2003. In particular, it shows that authorities have taken decisions by assessing the benefits and costs of marginally increasing international reserves, taking into account the restrictions imposed by the prevailing economic conditions and institutional arrangements. They have ensured that central bank participation in the foreign exchange market follows previously announced rules so as not to disturb the normal operation of the floating exchange rate regime.

The paper is organised in five sections. The first discusses the reasons behind the decision to adopt a floating exchange rate regime and deregulate the foreign exchange market; the second describes the mechanisms used to accumulate international reserves during the period 1996-2001; the third deals with the consequences of international reserve accumulation, both for the formulation of monetary policy and for the financial situation of the central bank; the fourth focuses on the policies of international reserve accumulation put in place during the period 2001-03, after the Bank of Mexico had acquired a large stock of foreign assets; and the fifth offers some conclusions.

2. Floating as a long-term policy decision

For a number of years before the onset of the 1994-95 financial crisis, Mexico's exchange rate regime had been gradually becoming more flexible. To begin with, the rate had been allowed to fluctuate within an ever widening band, with a fixed floor and an upward crawling ceiling. Furthermore, some initial steps had been taken to foster the development of an institutional framework that would support more exchange rate flexibility.

Aiming for more flexibility was consistent with a series of liberalisation measures introduced in Mexico at the beginning of the 1990s. These policies deregulated the financial sector and reduced the participation of the public sector in the economy. As an important aspect of the latter, a large number of public sector enterprises were sold to the private sector. Deposit and lending rates were freed, commercial banks' liquidity requirements were eliminated and credit allocation directives were abolished. Last but not least, a free trade agreement was signed with Canada and the United States and restrictions on foreign ownership of financial and non-financial companies were largely phased out.

After pegging the exchange rate for close to seven years, the Bank of Mexico was forced to let the peso float in December 1994. This was the only viable alternative at the time considering that the stock of international reserves had been almost completely depleted fending off several speculative attacks during 1994. Thus, the central bank was unable to influence exchange rate levels through foreign exchange market intervention. Furthermore, available international reserves barely covered a

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minimal part of the debt amortisation payments in foreign currency due at that time, which were concentrated in tesobonos (dollar-indexed government securities) and in short-term liabilities of Mexican commercial banks (Table 1).

Table 1
**Net international assets and
short-term amortisation payments**
In billions of US dollars

	1994	1995
Net international assets	2.3	-1.5
International reserves	6.1	15.7
Less liabilities with:		
IMF	3.9	15.8
Other central banks	0.0	1.5
Short-term amortisation payments	57.9	26.3
Tesobonos	29.2	0.2
Public sector	6.4	7.2
Commercial banks	15.5	11.9
Private sector	6.8	6.9

Sources: Bank of Mexico, *Annual Report*, 1994 and 1995; Ministry of Finance and Public Credit, *Data Book*, 1994 and 1995.

Tesobonos were zero coupon bills which paid, at face value, the amount of Mexican pesos required to buy a fixed quantity of US dollars. The pesos that the government had to disburse to the holder were computed by applying the spot exchange rate prevailing in the market two days in advance of maturity. This procedure implied that, to hedge their risk exposure, holders had to buy US dollars precisely at the time when the settlement exchange rate was determined. Therefore an important source of instability was introduced into the foreign exchange market, since bondholders became indifferent to any peso depreciation induced by their demand for US dollars. Moreover, during the first quarter of 1995 depreciation pressures on the peso arose after foreign financial institutions decided to close short-term credit lines to Mexican commercial banks.

The immediate goal of economic policy in early 1995 was to stabilise the exchange rate and ensure the solvency of the government. The first required securing an international financial assistance package, very aggressive hikes in domestic interest rates and the removal of dollar-indexed government securities holders from the foreign exchange market. The second involved a refinancing of liabilities, expenditure control and more revenues.

A priority during 1995 was to honour all short-term amortisation payments by refinancing them with credits obtained from alternative sources (multilateral financial organisations, central banks and the US government). In addition, a macroeconomic adjustment programme ensured an orderly contraction of domestic demand consistent with significantly narrowing the current account deficit and reducing the public sector borrowing requirements. In order to ease pressures on the foreign exchange market, the Bank of Mexico opened a facility to settle the amortisation of tesobonos directly in US dollars. The central bank also provided a credit line in US dollars to the deposit insurance trust fund (FOBAPROA), which in turn offered foreign currency liquidity to Mexican commercial banks facing the closure of interbank credit lines with foreign counterparts.

By the end of 1995 it was evident that the strategy had been successful. Payment obligations were honoured and the economy embarked on a process of rapid recovery. The financial situation was not as critical as it had been before. Short-term capital payments for 1996 were less than half the amount previously estimated for that year (Table 1). Mexican commercial banks regained access to foreign credit, so that during the second quarter of 1995 the central bank's emergency credit line to

FOBAPROA was fully paid back. In addition, by the end of the year the federal government was able to place debt instruments in international financial markets.

The improving macroeconomic environment and the stabilisation of the exchange rate opened the opportunity to reconsider the prevailing exchange rate arrangement. Mexico had a long history with fixed or quasi-fixed exchange rate regimes. However, at that point it had only very limited experience with a free float. Policymakers pondered the merits of keeping the float as an important element of long-term economic policy. In fact, the suggestion to adopt a currency board - which had been rejected in the past - gained renewed strength.

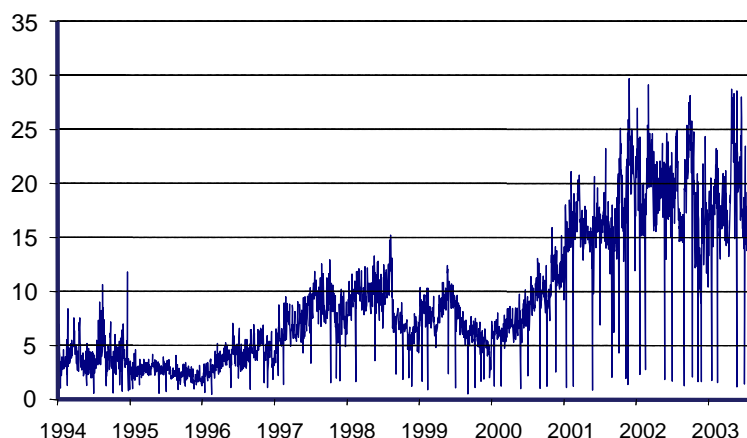
Many raised their voices in opposition to maintaining the float. The fragility of the banking system and the high levels of uncertainty prevailing in the domestic financial markets were often mentioned as factors to justify a framework for pegging the exchange rate. There were also some prestigious academics who vehemently argued in favour of reintroducing a currency band, pointing to the then successful Chilean experience.

The “fear of floating” literature and the lack of instances of other emerging market countries with a float continued to fuel doubts about the regime. In this regard some argued that implementing monetary policy in small open economies was not feasible without a nominal anchor. They warned that “fear of floating” would prevail over any other objective variable. Even though all kinds of different concerns were covered in the analysis, the financial authorities decided that a floating exchange rate regime was the best policy option for Mexico.

The decision to continue floating was based on the conviction that it was the best arrangement to prevent the exchange rate from drifting away from its equilibrium value for long periods, discourage short-term capital inflows, inhibit speculative attacks and extract information on market expectations. The authorities were convinced of the difficulties of targeting the exchange rate in a small open economy with unrestricted capital movement. The intensity of the 1994 speculative attacks on the peso, as well as the 1992 European experience with fixed exchange rates, also played an important role in convincing the authorities of their inability to counter the effects of today’s huge international capital flows.

The authorities were aware that, for the floating exchange rate regime to function properly, it was essential to have liquid markets. Otherwise, the exchange rate could become highly volatile. To increase liquidity in the peso foreign market, the Bank of Mexico removed all the restrictions imposed in preceding years and encouraged the development of derivatives markets. Hence, during 1995 the central bank allowed participants to operate forwards and authorised foreign banks to settle their foreign exchange transactions in pesos. As a result, the daily volume traded in the foreign exchange market increased tenfold (Graph 1).

Graph 1
Daily volume traded in the foreign exchange market
In billions of US dollars



Source: Bank of Mexico.

3. The policy of international reserve accumulation during 1996-2001: a float with accumulation

Although the exchange rate was to be determined by market forces, Mexican financial authorities decided to include the build-up of international reserves as an objective in the 1996 economic programme. There was at the time, in some influential circles, scepticism about Mexico's ability to put its house in order. If this view became widely shared it was feared that the liquidity crisis could take a turn for the worse, becoming a fully fledged solvency crisis. Therefore, the rationale behind reserve accumulation went beyond its importance in ensuring compliance with Mexico's foreign debt payments. It was also a signal to foreign investors and international rating agencies, which tend to associate a higher level of international reserves with lower country risk. Consequently, a large stock of international reserves also meant that Mexican borrowers could have access to more external financing on better terms.

Other catalysts for holding a larger amount of international reserves came to the surface during 1995. The first emerged at the beginning of that year, when the Bank of Mexico acted as lender of last resort in foreign currency to support some Mexican banks through FOBAPROA. The second arose at the end of the year, when the central bank was compelled to intervene in the market to put an end to speculative pressures on the peso, fed by perceptions of its unwillingness to intervene given the low level of international reserves at hand.

With the decision to adopt a floating exchange regime for the long term, the policy of international reserve accumulation was then designed to avoid, as much as possible, any interference with the normal functioning of the foreign exchange market. In this regard, with a view to regaining market credibility, the authorities' commitment to the floating regime was frequently emphasised along with their decision to conduct monetary and exchange rate policies transparently.

The policy of international reserve accumulation took into account the restrictions imposed by the institutional framework affecting foreign exchange operations undertaken by the Bank of Mexico with public sector entities.

3.1 Foreign exchange operations with public sector entities

For several years the Bank of Mexico has conducted, almost on a daily basis, foreign exchange transactions with the federal government and with Pemex,² the public enterprise that deals with all aspects of the oil industry. Given the large size and unpredictable timing of these foreign currency operations, the Foreign Exchange Commission³ deemed it convenient to prevent them from taking place directly in the foreign exchange market and causing unwarranted volatility. The specific strategy that the Bank of Mexico applies to operate with public sector entities relies on the use of international reserves as a buffer stock. Thus, Pemex's net foreign exchange receipts (from oil exports and external financing) have been partially used to finance the federal government's foreign exchange requirements to service its external debt. Since Pemex's receipts have usually exceeded the federal government's external debt servicing needs, the central bank has ended up increasing its international reserve stock.

The regulation imposed on Pemex does not coerce the firm to sell to the Bank of Mexico any specific fraction of its foreign currency receipts at a particular date. In fact, it has total discretion on the amount

² The legal basis for these transactions is found in the Law of the Bank of Mexico. Article 3 enables the central bank to provide treasury services to the federal government. Article 34 entitles the central bank to impose restrictions on foreign currency operations conducted by entities of the Federal Public Administration. The only entity that is currently subject to this restriction is Pemex, which has to carry out with the central bank any buy/sell operation of foreign currency against Mexican pesos.

³ According to Article 21 of the Law of the Bank of Mexico, in foreign exchange matters the central bank shall act in accordance with the guidelines established by the Foreign Exchange Commission. This Commission is formed by the Secretary and Undersecretary of the Ministry of Finance and Public Credit, another undersecretary of said Ministry appointed by the Secretary, the central bank Governor and two more members of the Board of Governors selected by the Governor. The Commission is presided over by the Secretary of Finance and Public Credit, who has the decisive vote in the event of a tie. Resolutions of the Commission are reached by majority vote, if and only if such majority includes at least one vote from a representative of the aforementioned Ministry.

and timing of any foreign currency sales to the central bank, subject only to some contractual conditions of an operational nature. The main reason for Pemex's selling most of its foreign currency receipts to the central bank follows from its legal obligation to discharge its tax liabilities with Mexican pesos.

In terms of their contribution to international reserve accumulation, Table 2 shows that foreign exchange operations conducted by Bank of Mexico with public sector entities have been the most significant source of reserves.

Table 2
Decomposition by source of annual flows of international assets
In billions of US dollars

	Total	Pemex	Federal government	Market operations	Other¹
1996	6.3	9.0	−3.6	0.9	0.0
1997	13.5	8.5	0.9	3.8	0.4
1998	3.7	5.4	−3.3	0.3	1.2
1999	3.9	7.4	−6.5	1.8	1.2
2000	8.2	11.2	−6.8	1.8	2.1
2001	9.2	8.9	−2.4	1.4	1.4

¹ Includes net income generated by investment of the Bank of Mexico's international assets.

Source: Bank of Mexico.

International reserve accumulation was particularly intense during 1996 and 1997, reflecting:

- (1) Relatively high oil prices (the average WTI price then was 20% above the level seen in previous years); and
- (2) The federal government's successful efforts to secure foreign financing in excess of its external debt service needs.

This favourable situation was reversed during 1998, when oil prices declined by almost 30% and the availability of foreign financing was substantially curtailed due to the East Asian and Russian crises.

3.2 Automatic mechanisms

In August 1996 the Foreign Exchange Commission announced the implementation of a scheme to buy US dollars through put options, which gave commercial banks the right to sell them to the central bank provided certain conditions in terms of the foreign exchange rate were satisfied. The objective was to accumulate international reserves beyond those flows obtained through foreign exchange operations conducted with public sector entities.

The options strategy enabled the central bank to increase international reserves without exerting undue pressure on the foreign exchange market or sending signals that could interfere with the proper functioning of the floating exchange rate regime. The aim was to purchase US dollars when the market offered them and to refrain from doing so when the exchange rate was under depreciation pressure. These objectives were incorporated into the mechanism's design, which included special features such as:

- (1) **Exercise price.** “Fix” exchange rate (MXN/USD) computed for the preceding day.⁴ Consequently, this price was not set at a level previously determined by the financial authorities, but endogenously adjusted to market conditions.
- (2) **Knock-in restriction.** Financial intermediaries could sell US dollars to the central bank if and only if the exercise price was below the moving average of the “fix” exchange rate computed for the previous 20 working days. Because of this the central bank was able to avoid purchasing dollars when the exchange rate appreciated from one day to the next (perhaps due to a possible correction in response to a previous overshooting). Otherwise it would have been favourable for option holders to exercise them and immediately repurchase the dollars on the exchange market.
- (3) **Option type and placement.** Put options were of the American type, so that in any day of the month commercial banks could exercise them as long as the knock-in restriction was satisfied. Regarding the procedure to place these options among banks, this was carried out through a multiple price auction conducted on the last working day of the previous month.

The put options programme successfully attained its objectives. From August 1996 to June 2001 the Bank of Mexico accumulated USD 12.2 billion of international reserves through this mechanism, an amount equivalent to 75% of the total auctioned (Table 3). Put options contributed almost one third of the increase in international reserves during the aforementioned period. Moreover, this accumulation was achieved without causing severe distortions to the foreign exchange market or altering the nature of the flexible exchange rate regime.

Table 3
Put options mechanism
In billions of US dollars

	Options	
	Placed	Exercised
1996 ¹	0.9	0.9
1997	5.2	4.4
1998	2.8	1.5
1999	3.0	2.2
2000	3.0	1.8
2001 ²	1.5	1.4
<i>Memo: 1996-2001</i>	16.3	12.2

¹ Starting in August. ² Up to June.

Source: Bank of Mexico.

To complement the options scheme for accumulating reserves, on 19 February 1997 the Foreign Exchange Commission authorised the Bank of Mexico to undertake daily sales of up to USD 200 million to market participants through auctions. This mechanism was geared to mitigate the volatility in the foreign exchange market by providing liquidity during days when uncertainty prevailed, thus discouraging some participants from engaging in speculative strategies. The selling process was implemented through auctions conducted each day and by imposing on banks the requirement that

⁴ The “fix” exchange rate is determined by the central bank as an average of quotes in the wholesale foreign exchange market for transactions payable in 48 hours (spot).

valid bids had to be at least equal to a minimum price, determined by the “fix” exchange rate of the previous day multiplied by a depreciation factor of 1.02.

Recourse to the auction facility to sell dollars to participants in the foreign exchange market was infrequent. This was so because only under fairly atypical conditions did the exchange rate depreciate at least 2% in a single day. In fact, the sales facility was activated on only 14 days between February 1997 and June 2001. Furthermore, almost 60% of total sales occurred during the period from August 1998 to January 1999, which was characterised by very high volatility in international financial markets. Because liquidity was smoothly provided to the foreign exchange market during episodes of turbulence, it can be said that this strategy was also successful. Yet, it did not prevent the Bank of Mexico from implementing its only discrete intervention after 1995, which took place on 10 September 1998, involving a sale of USD 278 million. The net accumulation of international reserves obtained through the use of automatic mechanisms is presented in Table 4. In particular, it is important to underline that close to 16% of the dollars acquired by the central bank through the exercise of put options were recycled to the foreign exchange market via auctioned sales.

Table 4
**International reserve accumulation
through automatic mechanisms**
In billions of US dollars

	Options exercised	Sales auctioned	Net accumulation
	(A)	(B)	(A-B) ¹
1996 ²	0.9	0.0	0.9
1997	4.4	0.6	3.8
1998	1.5	0.9	0.6
1999	2.2	0.4	1.8
2000	1.8	0.1	1.8
2001 ³	1.4	0.0	1.4
<i>Memo: 1996-2001</i>	<i>1.4</i>	<i>0.0</i>	<i>1.4</i>

¹ Some entries are subject to rounding error. ² Starting in August. ³ Up to June.

Source: Bank of Mexico.

4. Consequences of the build-up of international reserves: the sterilisation policy and its costs

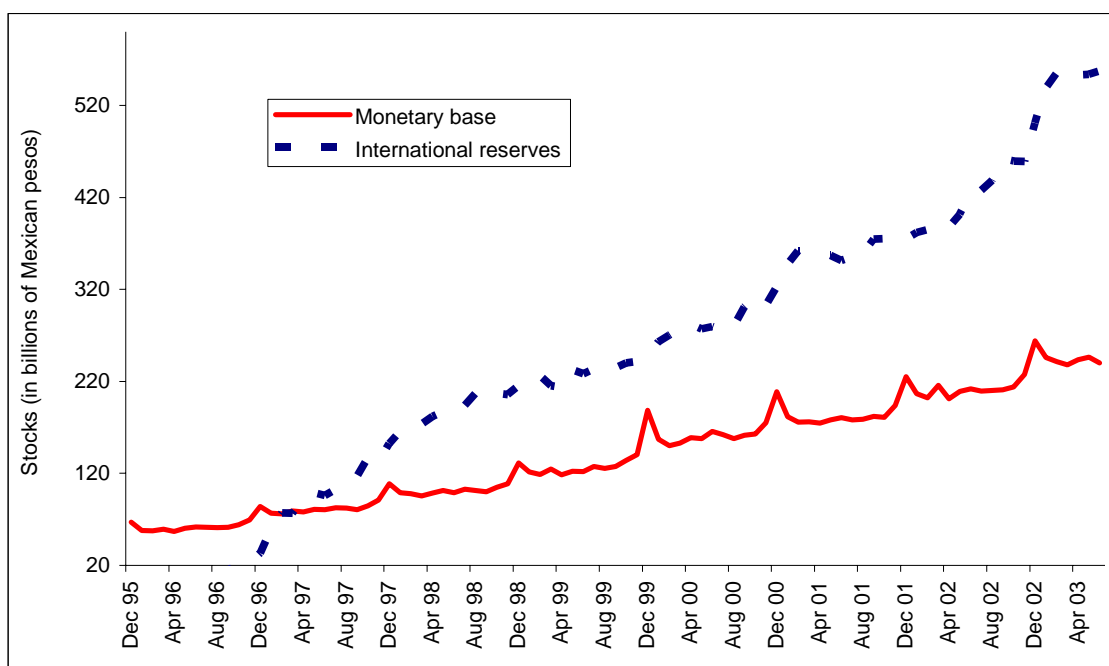
The accumulation of international reserves had implications for the implementation of open market operations aimed at regulating money market liquidity. As the central bank's international reserves grew, so did the amount of liquidity that had to be sterilised. By April 1997, international reserves measured in pesos were larger than the stock of base money (Graph 2). As the accumulation continued, the central bank had to devise more effective means to nullify the monetary impact of its acquisition of foreign currencies, since the sterilisation policies being followed were having undesirable effects on the conduct of monetary policy.

4.1 Monetary policy implications

Sterilisation policies implemented as from 1997 were designed to avoid signalling desired interest rate levels to the market. This was considered of crucial importance given that the operational procedures

to implement monetary policy have as their target commercial banks' end-of-day settlement balances at the central bank. It is important to stress that the central bank does not remunerate settlement balances. Therefore, for reasons of symmetry, it charges a penalty rate on overdrafts equivalent to twice the overnight interbank interest rate. Restrictive monetary policies are signalled by announcing the intention of the central bank not to fully satisfy the demand for funds, thus forcing some commercial banks to incur overdrafts on their accounts at the central bank. In other words, the central bank leaves the market short of funds. This is the mechanism known as “corto” in Spanish. Such monetary policy signalling, transmitted through changes in the settlement balances objective, is designed to indicate desired upward or downward changes in interest rates without specifying particular levels.

Graph 2
International reserves and the monetary base



Source: Bank of Mexico.

The speed and scale of international reserve accumulation in 1997 led the Bank of Mexico to reduce its primary credit. Otherwise, the excess money supply that would have been created could have resulted in higher inflation and rising nominal and real interest rates. Thus, from the beginning of 1997 the stock of net domestic credit moved to negative territory. In order to drain the liquidity resulting from international reserve accumulation, commercial banks were induced to make deposits at the central bank. In addition, at a later date, the Bank of Mexico sold government paper in the open market. Consequently, the financial position of the central bank went from net creditor to net debtor. Meanwhile, vis-à-vis the rest of the world, its net creditor position strengthened.

From the early months of 1997 on, the policy of absorbing liquidity relied mainly on auction-determined commercial bank deposits at the central bank. During March and early April, interbank rates started to climb, notwithstanding the fact that the exchange rate was appreciating and rates on government paper remained relatively stable. This odd behaviour of short-term interest rates and the exchange rate was the outcome of a temporary erosion of competition in the money market, due to the following factors:

- (1) Commercial bank deposits at the central bank had no secondary market. Consequently, banks attempted to obtain a risk premium to compensate for their lack of liquidity and demanded a much higher return in order to make additional deposits.

- (2) Occasionally, liquidity was concentrated in a small number of banks and it was relatively easy for them to apply money market strategies aimed at securing higher returns on their deposits at the central bank.

To deal with this situation, and restore orderly conditions in the money market, the Bank of Mexico increasingly turned to sales of long-term government paper (BONDES), both through direct sales and repos. Commercial banks were then willing to forgo their liquidity since in return they received government paper which had a secondary market.

Upward pressure on interest rates eased and the premium demanded on deposits at the central bank virtually disappeared as more players participated in the market. The latter were banks which did not have excess liquidity at the time of the auctions held to entice deposits. In the new setup, those banks could incur overdrafts on their current accounts at the central bank to acquire government paper. Should the need arise, banks could resell the paper immediately and thus cover the overdraft.

Maintaining a net creditor position vis-à-vis the financial system in order to preserve the effectiveness of monetary policy became an explicit objective of the Bank of Mexico. In addition to recurrent sales of long-term government paper, it relied on compulsory deposits wherever the expansion of liquidity outran the sterilisation process. These deposits were implemented as a once-and-for-all given amount of liquidity drawn from the money market sporadically.⁵

By the middle of 2000 it became obvious that commercial banks were holding too much long-term government paper as a result of the sterilisation process. Moreover, the banks were funding their holdings of long-term government paper on a daily basis. Thus, banks were unduly exposed to upward movements in interest rates, at a time when the central bank was implementing a restrictive monetary policy to counter aggregate demand pressures.

In response, beginning in August 2000 the Bank of Mexico started to issue its own securities, called BREMs (Monetary Regulation Bonds).⁶ BREMs are marketable floating coupon bonds (the coupon is determined every 28 days and is equal to the average of the daily overnight interbank interest rate observed during that 28-day period) which have a relatively long term to maturity (one and three years). These securities are placed weekly through primary auctions that are open to commercial banks, brokerage houses and investment funds.

The stock of sterilisation instruments (BREMs) placed by the Bank of Mexico has followed an upward trend (Graph 3) in tandem with the path of international reserves. On average, close to 76% of the stock of international reserves valued in Mexican pesos has been financed through such instruments. The remaining portion has been financed mainly with base money. To the extent that domestic interest rates have remained significantly above the level of international rates, the Bank of Mexico has faced the non-trivial costs of accumulating international reserves.

Regarding the choice of sterilisation instrument, it is important to stress that this decision does not depend on the type of factor inducing the excess of liquidity, but rather on the actual and projected path of liquidity.

4.2 Implications for the financial situation of the central bank

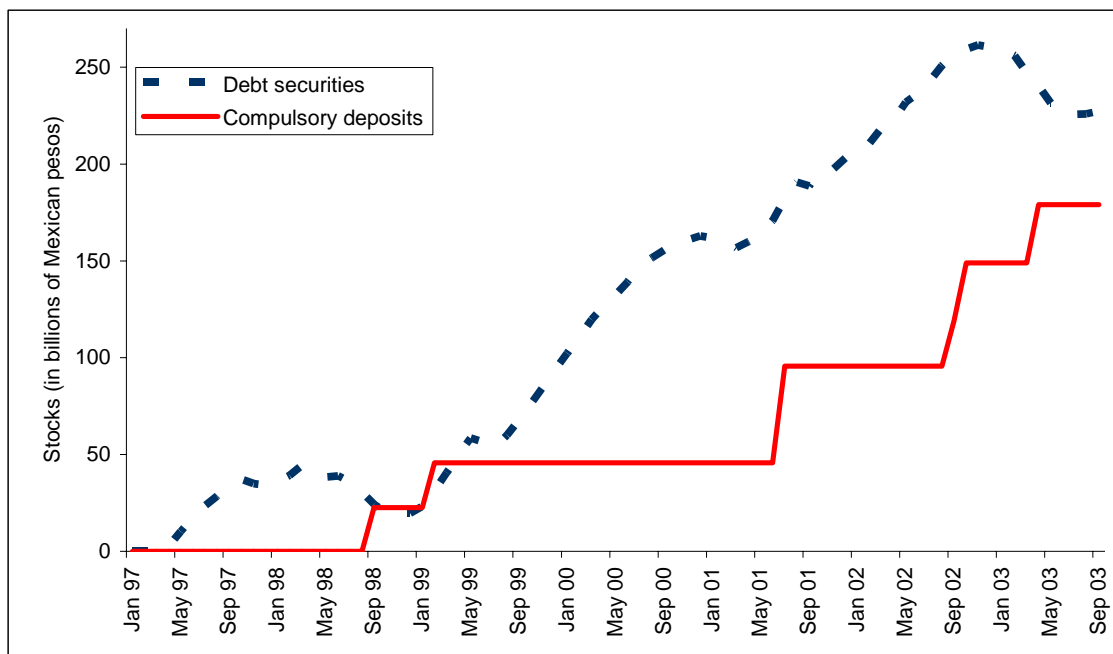
Even though sterilisation policy helped preserve the effectiveness of monetary policy procedures, success came at a cost. First of all, given that domestic interest rates have been higher than international rates, the liabilities in pesos incurred by the central bank have an impact on interest costs in excess of the returns obtained from investing the stock of international reserves. Furthermore, as the exchange rate has fluctuated, the value in pesos of a given stock of international reserves has

⁵ Compulsory deposits have been required on several occasions (September 1998; February 1999; July 2001; and April 2003). There was also an instance of voluntary deposits in September 2002 which were converted to mandatory deposits in April 2003.

⁶ Before August 2000, the Bank of Mexico used government securities in the sterilisation process. However, in order to have total independence from the federal government regarding sterilisation policy, and to take advantage of the intense activity in the overnight market, the Bank took the decision to issue BREMs.

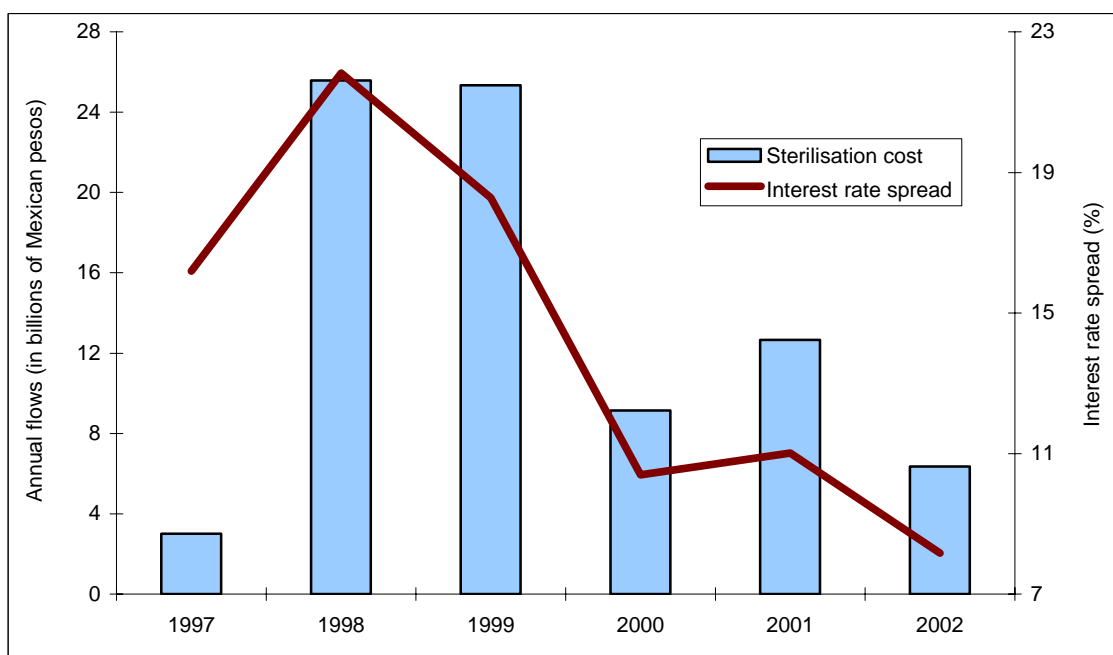
gone up or down. Since the appreciation trend of the exchange rate lasted until April 2000, its influence on the financial results of the Bank of Mexico was not trivial (Graph 4).

Graph 3
Sterilisation instruments



Source: Bank of Mexico.

Graph 4
Sterilisation costs and interest rate spread



Source: Bank of Mexico.

5. The policy of international reserve accumulation during 2001-03: slowing the pace

Through its policy of international reserve accumulation, the Bank of Mexico purchased more than USD 38 billion up to March 2001. However, the trend of such purchases and the implications of funding the corresponding peso stock motivated an analysis of the benefits and costs of continuing with the strategy. The results of this appraisal indicated that the benefits of holding a continuously increasing amount of international reserves were not as compelling as before, mainly because Mexico had just been granted an investment grade status by all major credit rating agencies and the external debt profile of both the public and private sectors had continuously improved during the previous years. Cost considerations became more relevant, not just those stemming from the sterilisation policy, but also the opportunity costs regarding alternative productive uses of the foreign financing accumulated as international reserves.

The process of assessing the relative advantages of further accumulating international reserves benefited from some technical papers produced by Bank of Mexico staff in order to estimate the “adequate” level of international reserves. Some of those papers even questioned the wisdom of maintaining international reserves under a floating exchange rate regime. The answer to this was that international reserves were required by central banks, among other reasons, because they are deemed by credit agencies and some financial institutions to be an important factor influencing the availability and cost of foreign financing. Accordingly, the “adequate” level of international reserves was estimated as a function of the present value of Mexico’s external debt amortisation flows. This implied that as the payment profile of the country’s foreign debt improved, the need for international reserves should be reduced. The papers provided estimates derived from ad hoc rules and also from theoretical models aimed at minimising both the carry-on costs of international reserves and the interest rate spread on the external debt. All of them suggested that the level of reserves then at hand was more than “adequate”. The case for not pursuing a much higher level of international reserves was further strengthened by the possibility that Mexico could become the first country to have access to the Contingent Credit Line (CCL) facility that the IMF was planning to unveil. The CCL offered emergency resources to countries with good fundamentals that suffered contagion from events unfurling elsewhere. Alternatively, contingent lines could be arranged with foreign commercial banks at a lower cost than that associated with additional international reserve accumulation.

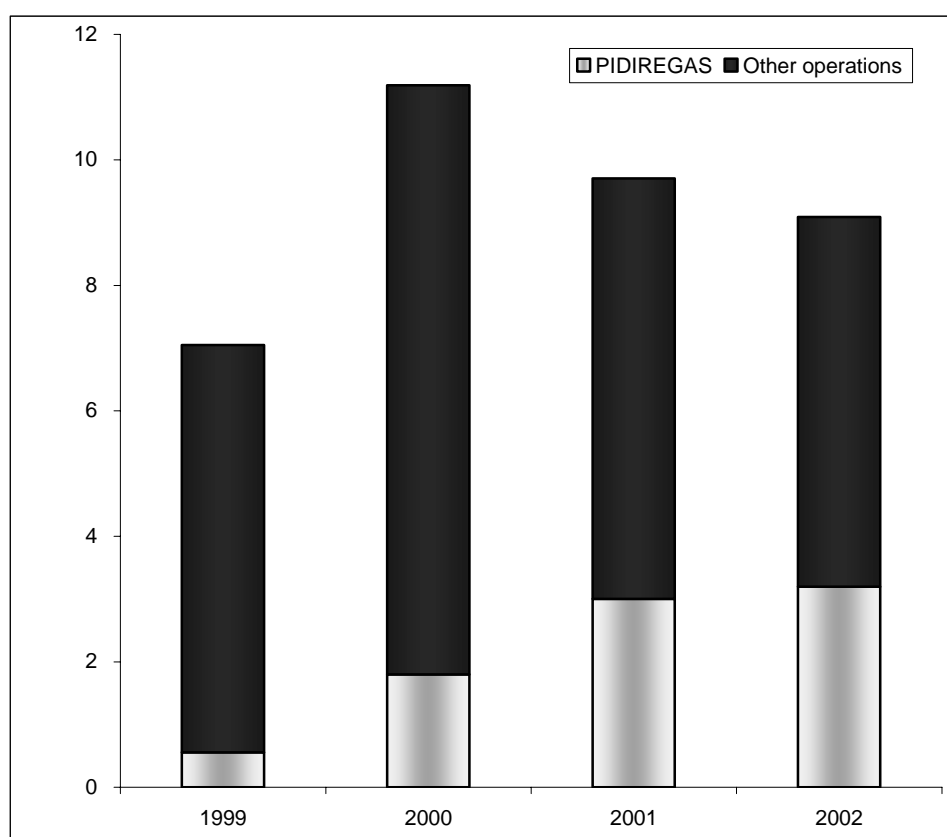
Nonetheless, international reserves continued rising and the stock reached USD 48 billion by December 2002, clearly indicating that the termination of the put option mechanism - in June 2001 - in order to slow the pace of accumulation had turned out to be insufficient.⁷ This result was mainly associated with the restrictions imposed by the institutional arrangement regarding the foreign exchange operations of the Bank of Mexico with Pemex. In particular, since 1999, Pemex has obtained foreign financing for investment projects (PIDIREGAS) that have a special off-budget treatment because of their long-term horizon and high rate of return. As shown in Graph 5, foreign exchange operations conducted by the Bank of Mexico with Pemex related to PIDIREGAS projects have increased both in absolute and in relative terms.

Taking into account the projected international reserve flows to be derived mainly from foreign exchange operations conducted with Pemex, the arguments stressing that the costs of additional accumulation were now larger than the benefits acquired added relevance. Consequently, the Foreign Exchange Commission decided to implement, starting in May 2003, an automatic mechanism in the foreign exchange market with the aim of further easing the pace of international reserve accumulation. It is important to underline that by introducing this mechanism the Mexican financial authorities neither adopted a target nor defined an optimal level for international reserves. Instead, the objective is to supply a fraction of the marginal accumulation of reserves to the market in order to contain the financial and opportunity costs of holding additional foreign currency.

⁷ The daily sales scheme was phased out in July 2001.

Graph 5
**Decomposition of foreign currency sales
 by Pemex to the Bank of Mexico**

In billions of US dollars



Source: Bank of Mexico.

The objective of slowing the pace of accumulation has been pursued by the Bank of Mexico by selling, through daily auctions, a fixed amount of dollars in the foreign exchange market. The selling mechanism is based on a transparent procedure designed to prevent additional uncertainty in the financial markets and to minimise discretionary actions by the financial authorities. The main features of the mechanism are:

- (1) **Amount.** The Bank of Mexico sells US dollars in the foreign exchange market in an amount based on the international reserves accumulated during a 13-week measurement period. Given the objective of slowing the pace of accumulation, the central bank sells half of the international reserves flow registered during the measurement period, whenever the flow has a positive sign. The fixed amount of dollars to be sold daily is obtained by dividing the total amount allowed under this rule by the number of working days in a three-month period.
- (2) **Transitory suspension.** The selling mechanism is temporarily suspended if the amount of international reserves to market, obtained in any measurement period of 13 weeks, falls below USD 125 million. The mechanism is reactivated once the total accumulation of international reserves exceeds USD 250 million for the measuring period.
- (3) **Operational features.** Auctions are conducted through an electronic interactive framework with Mexican resident banks, at the same time (9.30 am) each working day. The results are publicised 10 minutes after the auction is closed at the latest.

Up to the time of writing (November 2003) there have been three measurement and sales periods using the automatic mechanism of daily sales of US dollars through auctions (Table 5). In each of them the application of the rules has resulted in a net measured accumulation of international reserves, above USD 250 million, and the mechanism has been activated. However, the amount of

daily sales has decreased from USD 32 million initially to USD 6 million at the time of writing, an outcome of the relatively high demand for foreign currency by the federal government to service its foreign debt, specifically for the prepayment of Brady bonds in August 2003.

Table 5
**Automatic mechanism for daily sales
of US dollars through auctions**

In billions of US dollars

	Measurement periods		
	1st	2nd	3rd
	17 Jan-16 Apr 2003	16 Apr-18 Jul 2003	18 Jul-17 Oct 2003
International reserves			
I. Cumulated flow	4.2	0.0	-0.3
Explained by:			
a. Pemex	3.7	3.0	3.1
b. Federal government	0.1	-1.8	-2.7
c. Market operations	0.0	-1.8	-1.1
d. Other	0.4	0.5	0.4
	Sales periods		
	1st	2nd	3rd
	1 May-31 Jul 2003	1 Aug-31 Oct 2003	1 Nov 2003-31 Jan 2004
A. Net accumulation (I-a)	4.2	1.8	0.8
B. Number of working days	65	65	61
<i>Memo: Daily amount of sales (A*.5/B)</i>	<i>0.032</i>	<i>0.014</i>	<i>0.006</i>

Source: Bank of Mexico.

In terms of the effectiveness of the sales mechanism, a significant easing of the pace of international reserve accumulation has been observed and there is no evident impact of the daily auctions on the functioning of the foreign exchange market. Nevertheless, the mechanism has caused uncertainty among market participants because of the difficulties involved in estimating precisely the amount of US dollars that the central bank could sell in the near future.

6. Concluding remarks

The experience of Mexico in implementing a floating exchange rate regime has been successful, as evidenced by the relatively low level of volatility of the Mexican peso implicit in option prices, the wide choice of hedging instruments and the high volume traded daily in the foreign exchange market. This regime is a key element of a strategy that pursues a strictly market-oriented financial system. In this regard monetary policy relies on the market to determine the proper level of interest rates while the role of central bank actions is limited to signalling the desirable direction of interest rate movements. Under this framework market participants decide on the combination of interest and exchange rates that is adequate to respond to disturbances affecting the economy.

This paper has discussed the policy of international reserve accumulation implemented by the Bank of Mexico during the period in which the Mexican peso has been floating. It has been stressed in the discussion that this policy has been designed with the objective of not interfering with the nature of the floating exchange rate regime. This is achieved by relying on automatic mechanisms based on previously announced rules that do not predetermine any level of the exchange rate. Furthermore, the policy of accumulation has been implemented as an element supporting the workings of the floating regime, by providing the central bank with degrees of freedom to face unexpected shocks. This policy has also taken into account the restrictions imposed by the prevailing environment and the institutional arrangements under which the central bank undertakes transactions with public sector entities.

Mexican financial authorities have made decisions regarding the accumulation of international reserves after careful analysis of the benefits and costs of additional flows, rather than by selecting an optimal or desired stock. In this regard, international reserve accumulation was chosen as a specific economic policy objective. It should be recalled that at the end of 1995 net international assets were negative, so that the benefits of accumulating international reserves were clearly higher than the foreseeable costs. To attain this objective, due advantage was taken not only of routine foreign exchange transactions with public sector entities but also of automatic mechanisms specially designed to minimise interference with the operation of the foreign exchange market. As international reserves began mounting, the Bank of Mexico had to face the consequence, and did so by sterilising the expansion of liquidity in the domestic money market. This policy brought about carry-on costs that adversely affected the financial situation of the central bank. The financial authorities recently implemented a new automatic mechanism to slow the speed of international reserve accumulation, because it was deemed that the financial and opportunity costs induced by the rapid inflow of reserves had exceeded the benefits.

Challenges of financial globalisation and dollarisation for monetary policy: the case of Peru

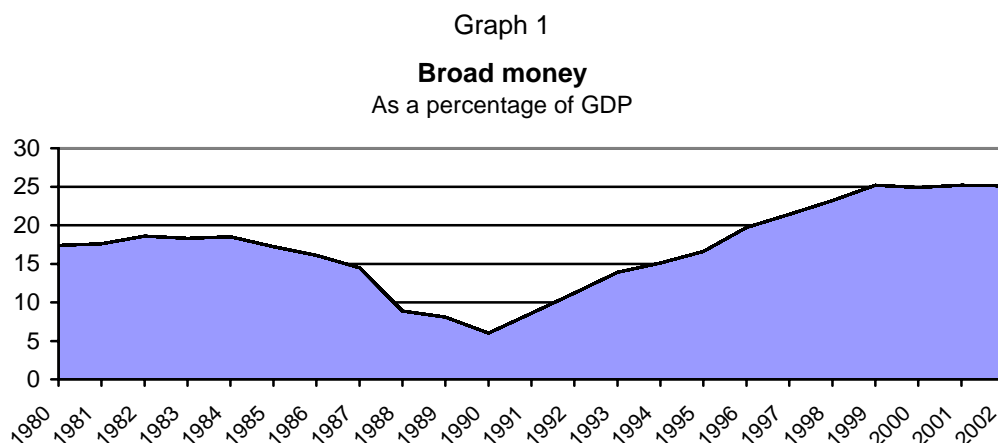
Julio Velarde

During the last decade, the financial system of Peru has become more integrated with the global financial system, as reflected in growth in dollar deposits. Over the same period, following an episode of hyperinflation (1988-90) and confiscation of dollar deposits (1985), the level of financial intermediation in the Peruvian banking system recovered and reached its highest recorded level (25% of GDP) in 2002. This paper reviews Peru's monetary policy experience in such an environment. In particular, the gradual reduction of financial dollarisation in the context of the recent adoption of an inflation targeting regime and the development of capital markets in local currency are discussed.

Evolution of the Peruvian financial system

Recovery of financial intermediation

Ensuring the financial system's ability to provide financial intermediation services has posed an important challenge for Peru. As a result of hyperinflation in 1988-90 and confiscation of dollar deposits in 1985, broad money had fallen to only 6% of GDP by 1990. The financial system recovered gradually, so that by 2002 the ratio of broad money to GDP had reached 25%, its highest recorded level (Graph 1). However, this indicator of financial intermediation is still lower than for most countries in the Latin American region.



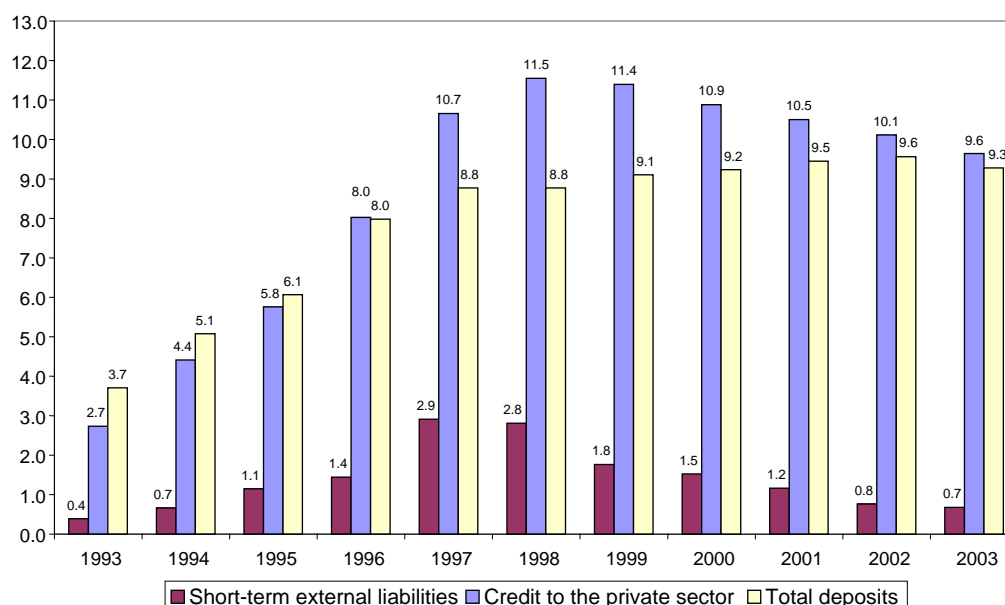
The recovery in financial intermediation was driven mainly by an increase in dollar deposits, resulting from the repatriation of Peruvian residents' deposits held abroad and the bank multiplier effect. A stabilisation programme, the restructuring of debts with foreign creditors and economic reforms improved confidence in the local financial system. Reforms included the liberalisation of the capital account (which included lifting restrictions on international capital flows and on holding foreign currency), the elimination of financial repression via the liberalisation of interest rates, the elimination of financial subsidies directed to specific sectors, the creation of a private pension system and the privatisation of state-owned banks.

As a result, Peru achieved a higher integration with international financial markets, which in turn has led to increased foreign investment in the local banking system. The share of foreign capital in the banking system was nearly nil in the early 1990s, but now foreign investors control 62% of Peruvian banks (as of September 2003). Moreover, the make-up of the banking sector also changed: from mostly state-owned banks to more private commercial banks.

Banks have also regained access to international markets. Thus, the short-term external liabilities of commercial banks grew from USD 387 million in 1993 to almost USD 3 billion in 1997. As a result, dollar-denominated credit to the private sector has grown, and has exceeded total foreign currency deposits since 1996 (Graph 2).

Graph 2
**Evolution of monetary aggregates of commercial
banks in foreign currency: 1993-2002**

In billions of US dollars



Financial integration has also led to the creation of derivatives markets, which, as in other emerging market economies, mainly involves the forward exchange market. Hedging with financial derivatives can help economic agents manage currency mismatches on their balance sheets. However, at the aggregate level the underlying exposure is not eliminated but transferred among residents. In this market, banks are the main suppliers because of their infrastructure and their participation in money and credit markets.

Compared to those of other emerging market economies (eg Chile), the Peruvian forward exchange market is very small. However, relative to other domestic financial markets, it is significant. In the forward market, daily transactions average about USD 25 million. This mainly involves operations with clients (USD 20 million) and short (sell) forward contracts (USD 18 million). The daily average amount of interbank operations is about USD 5 million and responds to banks' partial hedging of their short positions with clients. Regarding the term structure, purchases are concentrated in the short term, while sales are distributed in terms up to one year. Liquidity for long-term operations (more than a year) is very thin. As at October 2003, the stock of banks' sales to the public in the forward market is USD 949 million, while the stock of banks' purchases is USD 358 million.

The demand for forward cover exceeds supply largely because exporters, the potential sellers of short forwards, do not participate in the forward market since they are naturally hedged (their liabilities are dollarised, as discussed below). On the demand side, the main participants are corporate clients (utilities and commerce sector) and foreign clients with domestic investments.

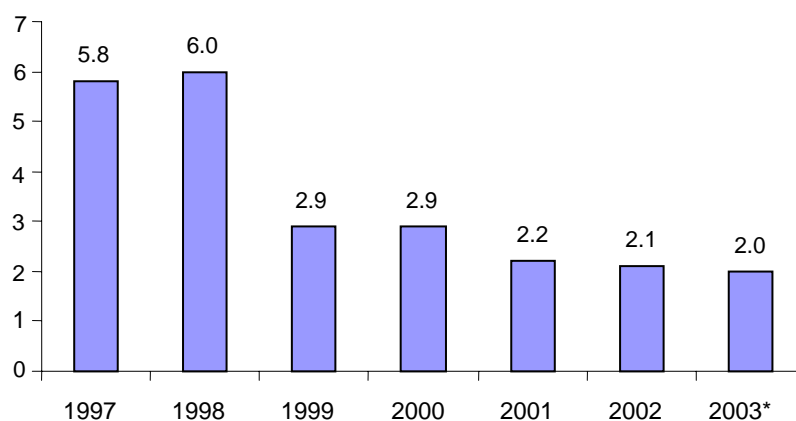
Impact of capital outflows on the financial sector

Peru, like other countries, has faced external financial restrictions coming mainly from international crises. From 1997, capital inflows to emerging and transition markets diminished due to international crises in July 1997 (Asia), August 1998 (Russia) and 1999 (Brazil). Peru, which was seriously hit by

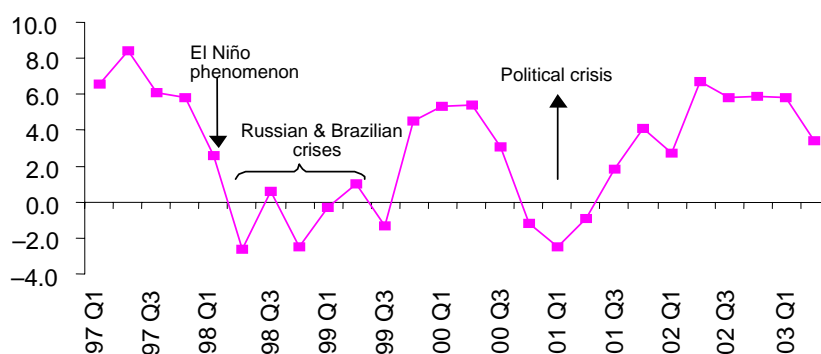
these shocks, was also affected by political crisis due to the presidential and congressional elections in 2000 and 2001. Short-term capital flows moved from an inflow of USD 3,583 million in 1993-97, to an outflow of USD 2,283 million in 1998-2000.

As a result of capital outflows, the current account deficit dropped drastically from 6% to 3% of GDP between 1998 and 1999, while output growth turned negative in this period (Graphs 3 and 4).

Graph 3
Current account deficit
As a percentage of GDP



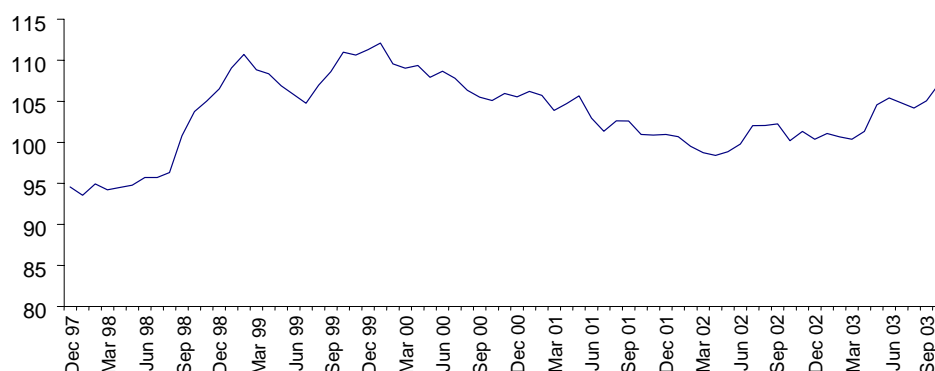
Graph 4
Real GDP growth
Year over year change, in per cent



The depreciation of the real exchange rate following the external crises in 1998 (Graph 5), in a context of high dollarisation of assets and liabilities of households and firms, had a contractionary impact on the real sector of the economy through balance sheet effects.¹

¹ A devaluation would increase the dollar-denominated liabilities of borrowers. If these borrowers earn income or hold assets denominated in local currency, their net worth will decline and this can lead to bankruptcy if the effect is sufficiently large. The fall in net worth weakens the financial position of lenders, and reduces credit extended in the economy and investment spending.

Graph 5
Multilateral real exchange rate index
1994 = 100



Note: An increase indicates a depreciation.

The negative effects of international and political crises were counteracted by Peruvian macroeconomic stability, the proper management of the exchange rate and a high level of international reserves. After the Russian crisis, Peru adopted a number of measures in response to slower capital inflows, such as reducing reserve requirements on foreign currency (which led to a decrease in international reserves of USD 1 billion between August and December 1998). However, the outflow of capital in the fourth quarter of 1998 and the resulting liquidity shortage resulted in a credit crunch: banks were reluctant to provide credit to the private sector, resulting in excess monetary reserves in the banking system.

Preventive measures

A dollarised financial system involves two risks that need to be addressed with prudential measures, including an adequate level of net international reserves:

Currency mismatch risk. This requires the central bank to have the ability to reduce exchange rate volatility through its monetary and exchange rate operations.

Risk of a bank run in dollar deposits. This requires that the central bank ensure that financial institutions have sufficient foreign currency funds available to maintain the confidence of depositors. This can be achieved by way of high reserve requirements on dollar-denominated deposits.

In Peru, the central bank's foreign reserves had increased prior to the international crises of the late 1990s because privatisation proceeds were deposited with the central bank by the public sector. Net international reserves have grown in recent years, such that they now exceed the peak level reached before the external crisis of 1998 (Table 1).

Table 1
Net international reserves
In millions of US dollars

	1991	1994	1997	1998	1999	2000	2001	2002	2003 ¹
Net international reserves	1,302	5,718	10,169	9,183	8,404	8,180	8,613	9,598	10,496
Net international position	-55	1,179	2,301	2,151	2,538	2,624	2,914	3,341	4,327
Financial system deposits	863	2,259	3,713	3,064	2,965	2,952	3,196	3,381	3,257
Public sector deposits	560	2,258	4,118	3,997	2,963	2,694	2,536	2,900	2,943

¹ As of 25 November.

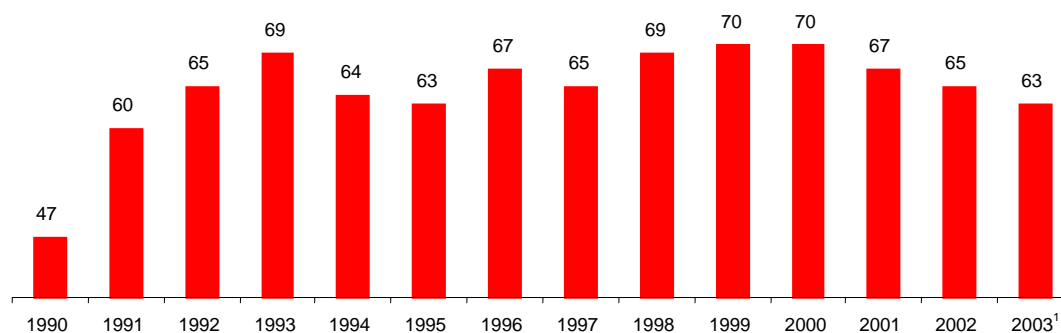
Apart from accumulating reserves, the central bank has set high reserve requirements on dollar deposits (about 30%). The country's banking and insurance supervision institution (SBS) has also established a liquidity requirement on short-term dollar liabilities (20% of total short-term liabilities). The high reserve and liquidity requirements reduce the need for the central bank to act as a lender of last resort, which would be particularly challenging in a setting of high financial dollarisation.

The availability of foreign reserves has permitted intervention in the foreign exchange market, which, along with high reserve requirements on dollar-denominated deposits, has attenuated the effects of external shocks on the economy.

Monetary policy in a dollarised economy

One of the most important issues associated with financial integration and monetary policy is a high degree of financial dollarisation (Graph 6). In Peru, dollarisation was caused by the high inflation experienced between 1975 and 1990, which prompted residents to turn to dollar-denominated assets as a store of value.

Graph 6
Banking system's broad money dollarisation
As a percentage of total broad money, end of period



¹ As of 30 September.

There are no capital controls or financial market restrictions in Peru. These types of controls are a sensitive issue for the Peruvian public, in part because the economy is dollarised, and also because of the poor experience with deposit confiscations in the 1960s and mid-1980s.

The high financial dollarisation in Peru has a bearing on the effectiveness of monetary policy and the choice of exchange rate regime. One view is that a floating exchange rate is preferable to a peg or to full (de jure) dollarisation, because - in spite of high dollarisation - the type of dollarisation in Peru does not involve major currency substitution² and because real dollarisation in the Peruvian economy is low (eg the pass-through from exchange rate changes to inflation is low). An exchange rate freely determined by the market would insulate the economy from external shocks and allow for an independent monetary policy aimed at anchoring expected inflation. Moreover, some authors have argued that the way to achieve a permanent reduction in the degree of dollarisation is precisely to anchor expected inflation at low and stable levels.

² Currency substitution involves the use of foreign currency as a means of payment or unit of account. Asset substitution involves the use of foreign currency denominated instruments for investment purposes.

However, the balance sheet effect resulting from financial dollarisation is an important challenge to the independence of monetary policy. Large and abrupt exchange rate movements may destabilise financial markets, with adverse effects on real economic activity. Another important feature of dollarised economies is the lack of financial instruments denominated in domestic currency, especially at long maturities.

The Central Reserve Bank of Peru has responded to these issues by adopting an explicit inflation targeting framework that combines an independent monetary policy with a floating exchange rate. The floating exchange rate regime reduces the possibility of a sharp depreciation associated with the collapse of a fixed exchange rate regime.

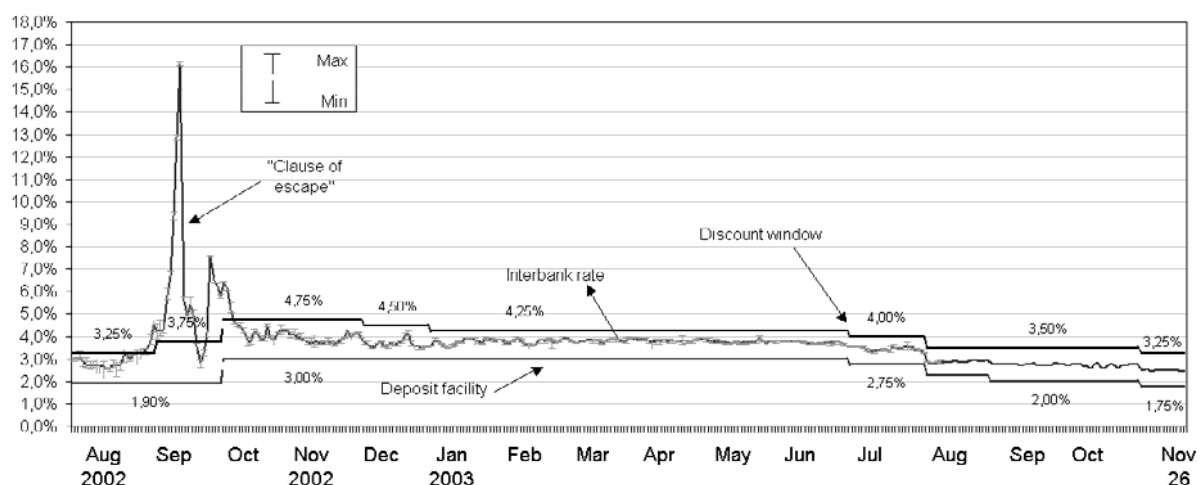
The central bank intervenes in the foreign exchange market to smooth fluctuations or reduce volatility, but it avoids fixing the exchange rate at any specific level. It could be argued that intervention is not necessary as a bubble in the foreign exchange market would not be sustainable, and markets would correct any deviations from equilibrium. However, the transition period could unnecessarily endanger financial markets in a dollarised economy.

That is the reason why the monetary policy regime in Peru has an “escape clause” to be applied in cases of extreme exchange rate volatility. This clause allows for a transitory increase in interbank interest rates in order to dampen speculation or calm markets. The escape clause was invoked in September 2002, when international uncertainty regarding presidential elections in Brazil induced volatility in the Peruvian foreign exchange market.

Operating procedures

In order to enhance the transparency of monetary policy, the central bank has changed its operating target from the money base to the level of the interbank interest rate (centre of a reference corridor), except in periods of financial stress when the “escape clause” is applied (Graphs 7 and 8). This approach has reduced the volatility of interbank rates (Table 2). The greater predictability of short-term interest rates in domestic currency (the new sol) has allowed the central bank to influence the evolution of the term structure of interest rates at longer maturities.

Graph 7
Interest rates in domestic currency
August 2002–November 2003



Graph 8

Interbank interest rate and nominal exchange rate

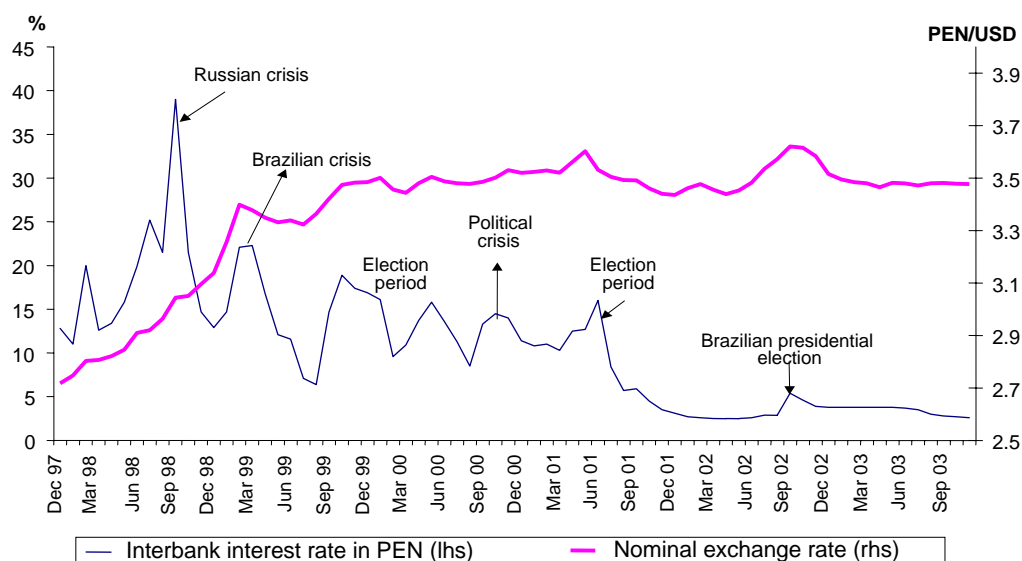


Table 2

Interbank interest rate

In percentage points

Year	Average	Standard deviation
1998	19.0	6.6
1999	14.9	4.8
2000	12.7	2.5
2001	8.6	0.9
2002	3.2	0.5
2003 ¹	3.5	0.1

¹ January-October.

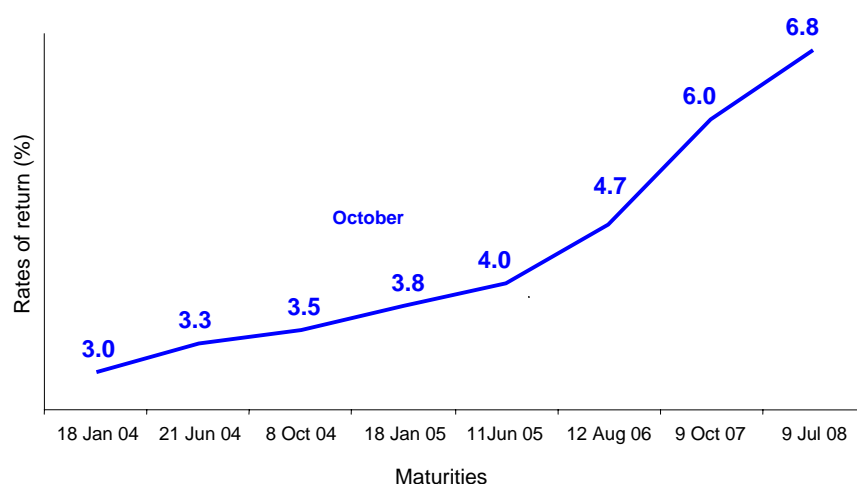
The central bank sells (buys) its own certificates of deposit (CDBCRPs) to withdraw (inject) liquidity into the system. Along with the CDBCRPs, liquidity is managed through short-term repurchase agreements and operations with treasury bills. At the end of the day, financial entities can make use of the following operations:

- **Monetary regulation credits (“discount window”).** These credits are designed to cover transitory liquidity shortages in financial entities. The discount rate is high enough to discourage the use of central bank funds and promote the interbank loan market.
- **Transitory foreign currency purchases (“swaps”).** The central bank purchases foreign currency from financial institutions with the commitment to buy it back the following day. The financial cost of this instrument is the highest between the domestic currency depreciation over the period in which the operation takes place and a commission established by the central bank.
- **Overnight deposits (deposit facilities).** Overnight deposits in both domestic and foreign currency at the central bank (one-day remunerated) contribute to monetary regulation by automatically absorbing liquidity surpluses and reducing the variability of commercial banks’ total current accounts held at the central bank.

Development of local capital markets

The expansion of monetary operations with CDBCRPs has allowed the interest rate of these securities to become a benchmark (up to three years) in the domestic financial market. In 2003, the increased issuance of CDBCRPs did not crowd out private issuance due to the still large demand for sol-denominated securities, mainly from institutional investors. That benchmark has been complemented by the recent development of an active public debt market in domestic currency (for instance, a primary dealer programme was established at the beginning of 2003). The Treasury has placed domestic currency bonds in nominal terms (BTPs) with maturities up to five years (Graph 9).

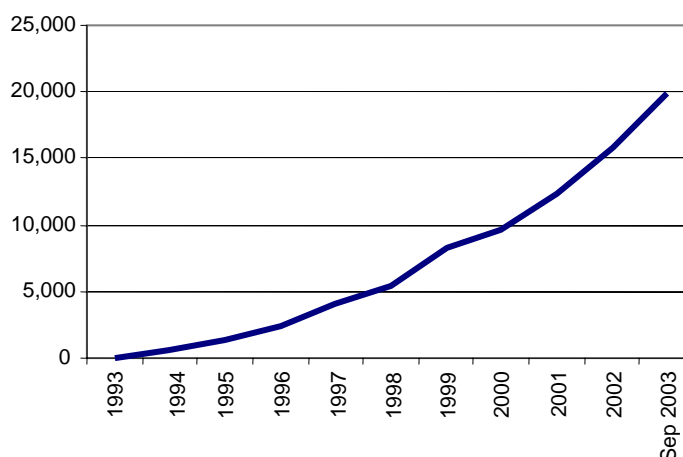
Graph 9
Yield curve of domestic government bonds



Institutional investors (banks and pension funds) are the most active participants in both the primary and secondary government debt markets. In particular, private pension funds (AFPs) have grown significantly since their creation in the early 1990s, becoming the main source of demand for securities in debt markets (Graph 10).

Graph 10
Evolution of private pension funds

In millions of new soles



Following the issuance of treasury bonds and CDBCRPs with longer maturities, the private sector started to place corporate bonds in domestic currency at nominal interest rates for the first time; this is a better financial alternative because it allows companies to match their incomes and expenditures in terms of currencies. In 2000, 23% of securities were issued in new soles; this figure grew to around 45% in 2002 (Table 3).

Table 3
Composition of private securities, in per cent¹

Year	Sales	Index (VAC)	Dollars
2000	1.6	20.5	77.9
2001	10.9	17.9	71.3
2002	13.0	17.2	69.8
2003 ²	15.6	17.7	66.8

¹ Includes public offers of bonds and short-term securities. ² As of November.

Table 4
Fixed income securities in domestic currency
Outstanding balances in millions of new soles

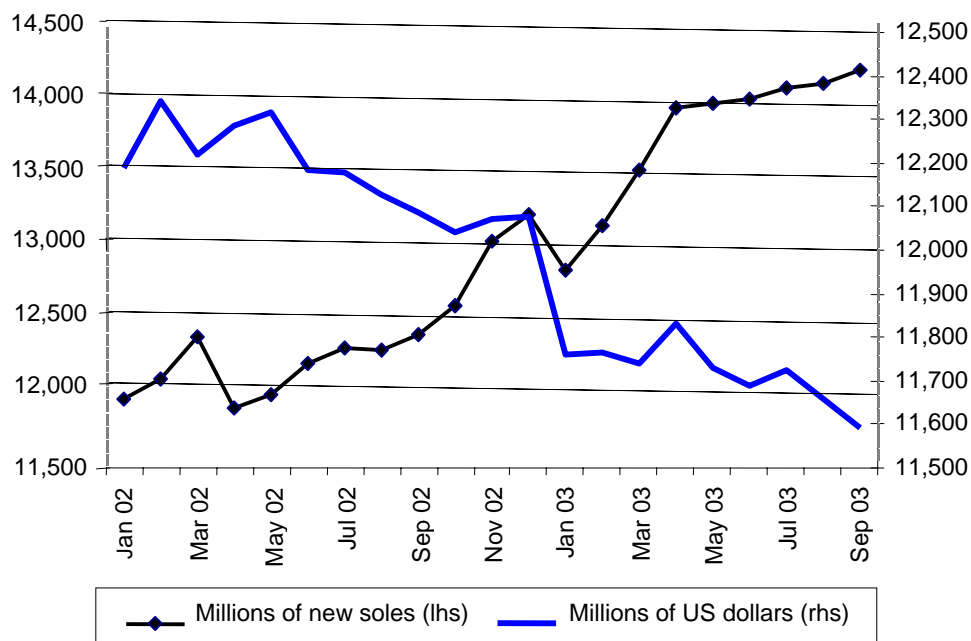
	December 2002	11 November 2003
Private issues	2,777	3,559
% change		28%
Commercial paper	604	734
Bonds	2,173	2,825

Table 5
Fixed income securities in foreign currency
Outstanding balances in millions of US dollars

	December 2002	11 November 2003
Private issues	1,829	1,973
% change		8%
Commercial paper	83	65
Bonds	1,746	1,908

Financial dollarisation has tended to fall in the last two years, with a clear increasing path for credits in domestic currency and a decreasing path for dollar credits (Graph 11).

Graph 11

Financial system credit to the private sector**Payment system**

Another step in the development of domestic financial markets is improving the efficiency of the payment system. In 2000, the Central Reserve Bank of Peru introduced a real-time gross settlement (RTGS) system. This system allows transfer of funds among financial system institutions by charging to their current accounts at the central bank. These operations are set and executed electronically, and settled on a one by one basis through a debit or credit to the current account of the involved financial institutions at the central bank. The RTGS system helps to eliminate the possibility of financial institutions overdrawing from the central bank within the day, and improves the speed and timing of settlements of interbank transactions in the payment system. In the near future, it is expected that the implementation of a delivery versus payment (DVP) system for clearing and settlement of transactions will minimise default risk, thus enhancing liquidity in domestic financial markets.

Returning to international capital markets

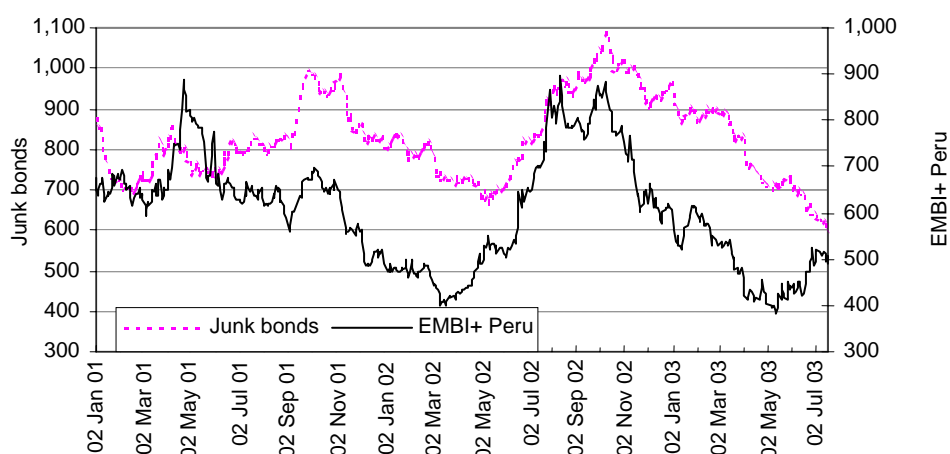
The central government has started to participate in international capital markets through the issuance of global bonds that diversify the sources for financing the fiscal deficit. After 70 years in which no international bonds were issued, in 2002 there were two issues totalling USD 1.9 billion (USD 1.4 billion in February and USD 0.5 billion in December), of which USD 0.9 billion was used for a Brady bond swap.

In 2003, conditions for issuing bonds in the international market improved in terms of interest rates and maturities. In November 2003, the Peruvian Government placed a USD 0.5 billion bond issue with a 30-year maturity and 8.8% yield. Although in principle this bond provides a benchmark for private issues in international markets, in practice Peruvian issuers have preferred the local market as a source of funding. This is explained by the excess liquidity accumulated by the banking system in previous years and the presence of institutional investors with an increasing demand for securities in the local market.

Emerging market economy bonds like Peru's are considered high-risk assets. This implies, as some recent research has shown, a high and positive correlation between the EMBI+ yield of Peru and the yield on so-called "junk bonds" (American corporate bonds that are rated below investment grade). Research has also found a positive relationship between the EMBI+ spread of Peru and that of Brazil, which reflects the importance of regional effects (Graphs 12 and 13).

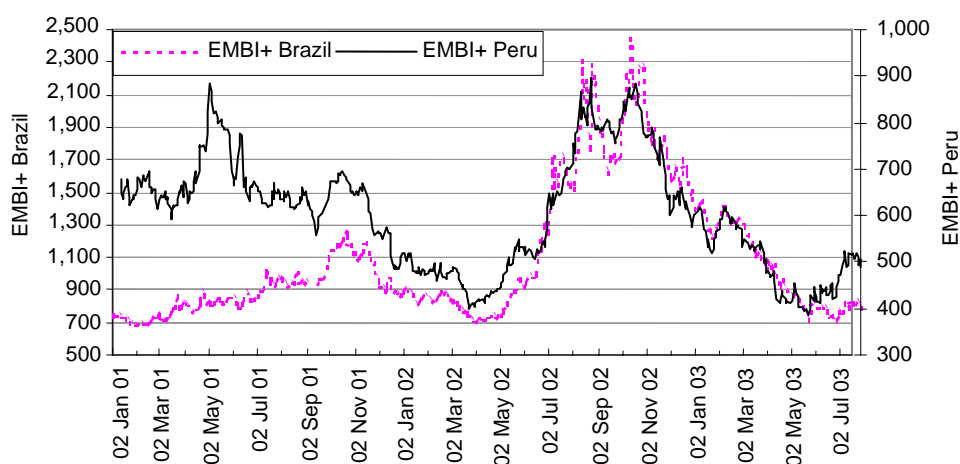
Graph 12

EMBI+ Peru and junk bonds



Graph 13

EMBI+ Peru and EMBI+ Brazil



Concluding remarks

In 2002, the Central Reserve Bank of Peru adopted an explicit inflation targeting framework. In spite of high financial dollarisation, a low degree of real dollarisation in the country allows an independent monetary policy aimed at anchoring expected inflation. The regime combines an independent monetary policy with a floating exchange rate. The floating exchange rate regime reduces the chances of a sharp depreciation that might otherwise be associated with the collapse of a fixed exchange rate regime.

However, the risks associated with a sudden and sharp depreciation of the currency are not negligible in a dollarised economy. With the aim of avoiding these risks, monetary policy operating procedures in Peru, which typically keep the interest rate within a predetermined band, contain an “escape clause” to be applied in circumstances of extreme exchange rate volatility. This clause allows a transitory increase in the policy interest rate (interbank interest rates) in order to dissuade destabilising speculation and calm the markets.

In order to enhance resilience in the face of shocks, the central bank has sought to maintain adequate foreign exchange reserve holdings, and set high reserve requirements on dollar deposits. The country’s banking and insurance supervision institution (SBS) has also established a liquidity requirement on short-term dollar liabilities.

The central bank conducts open market operations using its own certificates of deposit (CDBCRPs). Along with the CDBCRPs, liquidity is managed through short-term repurchase agreements and operations with treasury bills. The expansion of monetary operations with CDBCRPs allowed the interest rate of these securities to become a benchmark (up to three years) in the domestic financial market. That benchmark has been complemented by the recent development of an active public debt market in domestic currency.

The composition and management of capital flows in the Philippines

Amando M Tetangco, Jr¹

Introduction

The surge in capital flows to emerging market economies in the early to mid-1990s was a reflection of the rapid expansion and integration of international capital markets that had been driven by economic policy and structural changes. Technological advances and the emergence of increasingly sophisticated financial products have likewise increased the speed and complexity of capital account transactions. The global and domestic factors which influence capital flows to emerging markets can be categorised into two broad groups.² The first group is composed of country-specific or pull factors which determine the destination of flows. The pull factors include the adoption of economic liberalisation policies, improved macroeconomic performance, more investment opportunities and institutional reforms implemented in some developing countries. The second group covers push factors or those that are outside the control of a borrowing country. These include structural and cyclical conditions in lending countries which determine the timing and magnitude of flows. This paper will review and examine the experience of the Philippines regarding capital flows since the 1990s. It will focus mainly on the policy issues the country faced during the period.

Continued rise in financial integration in Asia

Some countries in Asia have been experiencing greater financial integration in the past two decades. This is based in part on the fact that the magnitude of capital flows in these economies has risen significantly.³ Table 1 presents gross private capital flows in selected Asian economies and shows that as a percentage of GDP, financial flows indeed increased between the 1980s and the early 1990s.⁴ The capital flows peaked around the 1996-98 period, and subsequently declined to more modest levels.

Another indicator of greater financial openness of these countries is the stronger linkage of their equity markets with major equity markets elsewhere in the world. Table 2 presents the simple correlation of stock markets in selected Asian countries with each other and with the equity markets in the United States and Japan.⁵ It may be observed that the correlation between the equity markets generally increased during the period 1996-2003 compared to 1990-95.

¹ Deputy Governor, Bangko Sentral ng Pilipinas (the central bank).

² See, for example, Yap (2001).

³ For comments on the advantages and disadvantages of gross capital flows as a measure of financial integration see, for example, Montiel (1994).

⁴ Gross capital flows are computed as the sum of inflows and outflows of items under the capital and financial accounts of the balance of payments as reported in the IMF's *International Financial Statistics*. Trade credits were not included in the computation.

⁵ Computed as monthly returns using end-month data on stock indices.

Table 1
Gross capital flows¹ as a percentage of GDP:
selected Asian countries

	Hong Kong SAR	Indonesia	Korea	Malaysia	Philippines	Singapore	Thailand
1980-84	...	4.8	4.8	13.2	7.1	35.4	1.9
1985-89	...	3.5	4.6	7.9	1.9	40.2	4.9
1990-94	...	4.4	5.5	13.9	8.0	40.7	11.0
1995	...	5.6	11.0	9.6	12.1	53.6	17.2
1996	...	5.3	13.1	9.9	18.3	65.3	11.9
1997	...	4.7	8.1	11.9	8.2	128.0	19.0
1998	203.2	10.1	8.3	11.1	8.8	43.0	26.0
1999	166.0	4.2	6.7	18.0	19.4	86.0	19.4
2000	152.7	5.2	7.7	15.4	8.1	59.2	13.4
2001	109.0	5.2	9.7	6.0	4.8	57.3	9.7

¹ Does not include trade credits.

Sources: IMF, *International Financial Statistics*; Bangko Sentral ng Pilipinas.

Table 2
Average correlation of stock market returns¹

	Hang Seng	Jakarta SE	KOSPI	KLSE	PHISIX	Strait Times	SET	Nikkei 225	Dow Jones
1990-2003	0.52	0.41	0.37	0.48	0.51	0.58	0.51	0.32	0.42
1990-95	0.52	0.33	0.19	0.54	0.48	0.58	0.49	0.25	0.35
1996-2003	0.52	0.47	0.45	0.46	0.53	0.58	0.53	0.40	0.46

¹ Computed as the simple correlation of a stock market with all the other stock markets included in the table.

Source: Bangko Sentral ng Pilipinas.

Trends and impact of capital flows in the Philippines

Trends and composition

Total net capital flows (excluding trade credits) to the Philippines grew steadily from 1992 as the country undertook foreign exchange liberalisation measures. Capital inflows declined in 1995 as access to international financial markets was affected by the Tequila (Mexican peso) financial crisis. The annual increase in capital flows reached a peak of about 220% in 1996 (Table 3b). However, as total capital flows to emerging market economies fell in 1997 in the aftermath of the Asian financial crisis, net capital flows to the country declined in 1997 and 1998. Capital inflows recovered sharply in 1999, supported by a surge in portfolio investments, but have since steadily declined. For the first seven months of 2003, capital and financial account posted a total net outflow of more than \$300 million (Table 3a). The deterioration resulted from the weak performance of the direct, portfolio and other investment accounts, reflecting the still cautious stance of investors and net repayment of maturing loans.

Table 3a
Net capital flows in the Philippines¹
 In millions of US dollars

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003 ²
Total capital flows, net	1,529	1,864	1,859	2,850	4,438	3,468	11,078	6,594	196	4,090	3,022	1,713	818	-332
Capital account	1	0	1	0	0	0	3	1	16	-8	38	-12	-19	-13
Financial account	1,528	1,864	1,858	2,850	4,438	3,468	11,075	6,593	180	4,098	2,984	1,725	837	-319
• Direct investment	528	527	675	864	1,462	2,014	474	1,086	2,108	1,754	1,453	1,142	1,026	10
• Portfolio investment	-128	361	-954	324	1,156	1,227	3,560	1,241	-749	6,874	207	1,050	1,912	1,005
<i>Of which: bonds</i>	-80	236	-1,016	376	887	979	1,381	1,592	-829	5,519	432	671	1,523	853
• Other investment	1,128	976	2,137	1,662	1,820	227	7,041	4,266	-1,179	-4,530	1,324	-467	-2,101	-1,334
<i>Of which: loans</i>	511	634	2,210	1,551	2,261	274	4,007	1,971	2,235	318	1,661	-652	-571	-763

¹ Excludes trade credits. ² January-July.

Source: Bangko Sentral ng Pilipinas.

Table 3b
Net capital flows in the Philippines¹
 Growth rates, in per cent

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003 ²
Total capital flows, net	21.9	-0.3	53.3	55.7	-21.9	219.4	-40.5	-97.0	1,986.7	-26.1	-43.3	-52.2	-127.1
Capital account	-100.0	.	-100.0	.	.	.	-66.7	1,500.0	-150.0	575.0	-131.6	-58.3	-44.4
Financial account	22.0	-0.3	53.4	55.7	-21.9	219.3	-40.5	-97.3	2,176.7	-27.2	-42.2	-51.5	-125.9
• Direct investment	-0.2	28.1	28.0	69.2	37.8	-76.5	129.1	94.1	-16.8	-17.2	-21.4	-10.2	-98.9
• Portfolio investment	382.0	-364.3	134.0	256.8	6.1	190.1	-65.1	-160.4	1,017.8	-97.0	407.2	82.1	-21.5
<i>Of which: bonds</i>	395.0	-530.5	137.0	135.9	10.4	41.1	15.3	-152.1	765.7	-92.2	55.3	127.0	-7.8
• Other investment	-13.5	119.0	-22.2	9.5	-87.5	3,001.8	-39.4	-127.6	-284.2	129.2	-135.3	-349.9	-45.2
<i>Of which: loans</i>	24.1	248.6	-29.8	45.8	-87.9	1,362.4	-50.8	13.4	-85.8	422.3	-139.3	12.4	-633.6

¹ Excludes trade credits. ² Growth for the period January-July 2003 was computed relative to the comparable level for 2002.

Source: Bangko Sentral ng Pilipinas.

Table 3c
Composition of capital flows in the Philippines¹

In per cent

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003 ²
Capital account	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	8.2	-0.2	1.3	-0.7	-2.3	-3.9
Financial account	99.9	100.0	99.9	100.0	100.0	100.0	100.0	100.0	91.8	100.2	98.7	100.7	102.3	-96.1
• Direct investment	34.5	28.3	36.3	30.3	32.9	58.1	4.3	16.5	1,075.5	42.9	48.1	66.7	125.4	3.0
• Portfolio investment	-8.4	19.4	-51.3	11.4	26.0	35.4	32.1	18.8	-382.1	168.1	6.8	61.3	233.7	302.7
<i>Of which: bonds</i>	-5.2	12.7	-54.7	13.2	20.0	28.2	12.5	24.1	-423.0	134.9	14.3	39.2	186.2	256.9
• Other investment	73.8	52.4	115.0	58.3	41.0	6.5	63.6	64.7	-601.5	-110.8	43.8	-27.3	-256.8	-401.8
<i>Of which: loans</i>	33.4	34.0	118.9	54.4	50.9	7.9	36.2	29.9	1,140.3	7.8	55.0	-38.1	-69.8	-229.8

¹ Excludes trade credits. ² January-July.

Source: Bangko Sentral ng Pilipinas.

In terms of composition, direct investments and loan availments comprised a significant share of foreign flows as they accounted for an average of about 37% and 50%, respectively, during the period 1990-95 (Table 3c). The share of these two components declined significantly in 1996-97 but recovered in 1998. From 1999 portfolio investments, particularly investments in bonds, and direct investments have generally been the most important sources of capital inflows.

Impact

The surge in capital flows in the 1990s affected the performance of the Philippine economy. Several areas were influenced by the trends in capital flows including the growth of domestic liquidity, volatility of financial markets, the movement of the real exchange rate and even asset booms.

1. Domestic liquidity, credit and dollarisation

Domestic liquidity and credit. From 1990 to 1997, domestic liquidity (M3) grew by an average of 19.8% annually (Table 4). The growth in money supply, which peaked at 26.5% in 1994, was supported by the rapid expansion in both the net foreign assets (NFA) and net domestic assets (NDA) of residents. NFA reverted to positive levels starting 1992 and grew as the liberalisation of foreign exchange regulations beginning that year resulted in higher foreign exchange inflows, including those from remittances of overseas Filipino workers (OFWs). This development helped boost the monetary authorities' NFA position, as banks and the national government sold part of their foreign exchange holdings to the central bank, the Bangko Sentral ng Pilipinas (BSP). However, NFA contracted in 1996 and was negative in 1997 following the Asian financial crisis. Meanwhile, NDA continued to grow from 1993 to 1997 as the intermediation of capital inflows by banks resulted in the expansion of the industry's resources and, consequently, a rise in credit growth, particularly to the private sector.

Table 4
Domestic liquidity
1990-August 2003

	Level (in millions of pesos)			Annual growth rate (in per cent)		
	NFA	NDA	M3	NFA	NDA	M3
1990	(93,816)	474,495	300,541	32.74	26.66	18.36
1991	(15,580)	453,822	347,079	83.39	-4.36	15.48
1992	62,986	432,590	385,385	504.27	-4.68	11.04
1993	82,882	552,745	480,329	31.59	27.78	24.64
1994	99,291	690,298	607,614	19.80	24.89	26.50
1995	111,408	907,313	761,430	12.20	31.44	25.31
1996	80,052	1,196,920	881,404	-28.15	31.92	15.76
1997	(76,855)	1,684,692	1,066,017	-196.01	40.75	20.95
1998	140,506	1,538,819	1,144,552	282.82	-8.66	7.37
1999	328,982	1,608,735	1,365,098	134.14	4.54	19.27
2000	342,667	1,736,698	1,427,397	4.16	7.95	4.56
2001	405,326	1,759,550	1,525,032	18.29	1.32	6.84
2002	541,411	1,809,334	1,669,662	33.57	2.83	9.48
Aug 2003	605,338	1,741,001	1,619,013	13.81	4.11	3.77

Source: Bangko Sentral ng Pilipinas.

Beginning in 1998, the growth in M3 declined markedly as the slowdown in NDA offset the continued rise of NFA. The deceleration in NDA may be attributed mainly to lower net credits to the private sector as the weak performance of the corporate sector during this period prompted banks to adopt a more cautious lending stance. At the same time, the economic slowdown and uncertainty in the international and domestic environment dampened the private sector's appetite for credit. The increase in NFA may

be attributed partly to revaluation adjustments arising from the general depreciation of the peso starting in 1997.⁶

*Dollarisation.*⁷ The magnitude of dollar-denominated assets held by residents or the degree of dollarisation has been increasing since the 1990s to coincide with the surge in capital inflows.⁸ Using the IMF standard, an economy is considered highly dollarised if the ratio of foreign currency deposits (FCDs) to money supply is greater than 30%. Table 5 shows that the ratio of FCDs to M3 for the Philippines increased from 21.2% in 1990 to 40.8% as of August 2003. Meanwhile, the ratio of FCDs to M4 (which is comparable to the IMF methodology) increased from 17.5 to 29.0% in the same period. This implies that the Philippines is nearing the threshold for a highly dollarised economy based on the standard set by the IMF. The increasing trend in dollarisation of the country could be attributed to institutional changes, particularly capital account liberalisation. The liberalisation of foreign exchange regulations in 1992 facilitated greater access of nationals to foreign currency assets and was mainly behind the surge in portfolio investments to the Philippines. The strength of foreign exchange inflows from OFWs and the recovery of exports also contributed to the continued growth in FCDs of non-bank residents. Expectations on the movements of the exchange rate likewise played a role in the build-up of FCDs. The expectation of a depreciating trend in the peso has partly encouraged foreign exchange earners to keep some portion of their dollar receipts in FCDs. The degree of dollarisation peaked in 1998 and has since remained generally at the same level.

Table 5
Ratio of FCDs to broad monetary aggregates
January 1990-August 2003

	M3	FCDs	M4=M3+FCDs	FCDs/M3	FCDs/M4
1990	300,541	63,808	364,349	21.23	17.51
1991	347,079	77,225	424,304	22.25	18.20
1992	385,385	94,458	479,843	24.51	19.69
1993	480,329	136,158	616,487	28.35	22.09
1994	607,614	158,788	766,402	26.13	20.72
1995	761,430	206,691	968,121	27.15	21.35
1996	881,404	317,564	1,198,968	36.03	26.49
1997	1,066,017	433,428	1,499,445	40.66	28.91
1998	1,144,552	477,935	1,622,487	41.76	29.46
1999	1,365,098	521,664	1,886,762	38.21	27.65
2000	1,427,397	585,986	2,013,383	41.05	29.10
2001	1,525,032	586,087	2,111,119	38.43	27.76
2002	1,669,662	628,448	2,298,110	37.64	27.35
Aug 2003	1,619,013	660,658	2,279,671	40.81	28.98

Source: Bangko Sentral ng Pilipinas.

⁶ The revaluation adjustments to the asset side are reflected under NFA while adjustments to the liability side are reflected under NDA (ie net other items).

⁷ Official or full dollarisation occurs when foreign currency (the US dollar is the most common) has exclusive or predominant status as full legal tender. This means that not only is foreign currency legal for use in contracts between private parties, but that the government also uses it in payments. Domestic currency may still exist but it is confined to a very minor role, usually coins that are used for small change. Meanwhile, partial dollarisation occurs when people hold a portion of their financial wealth in foreign assets. This is equivalent to "asset substitution" which results from the public's allocation decisions in view of the risk and return characteristics of domestic and foreign assets.

⁸ Theoretically, the extent of dollarisation is measured by the amount of dollar-denominated assets held by nationals. These cover dollar currency circulating within the economy, foreign currency deposits in the domestic economy, and cross-border deposits held in banks abroad. In practice, because of data constraints, the extent of dollarisation is usually measured by the ratio of foreign currency deposits held by residents to a broad money aggregate.

2. Volatility

Foreign exchange market. During the period 1980-89, the Philippine peso was generally stable with the average standard deviation of the daily exchange rates during the period at ₱0.60 (Table 6). Volatility increased to an average of ₱1.12 during the next five years (1990-94) as the rise in capital inflows exerted appreciation pressures on the peso in the foreign exchange market. Average volatility rose further to an average of ₱1.33 in 1995-99 as a result of heightened pressure on the peso following domestic and external shocks, such as the 1995 Tequila, 1997 Asian and 1998 Russian financial crises and the 1995 rice crisis. The spread of investor pessimism on emerging markets following the financial crisis in mid-1997 led to a slowdown in capital inflows into the Philippines and severe depreciation pressure on the peso. Volatility again rose to an average of ₱1.74 in 2000-03 with the sharp depreciation of the peso as a result of persistent negative market sentiment. Domestic political concerns led to a slowdown in foreign exchange inflows and fluctuations in the peso-dollar rate.

Table 6
Average FX volatility¹

	Average
1980-89	0.60
1990-94	1.12
1995-99	1.33
2000-03	1.74

¹ Standard deviation of the daily FX rates.

Source: Bangko Sentral ng Pilipinas.

Stock market. The volatility of the local equity market during the period 1995-2003 is shown in Table 7. The volatility of the Philippine Stock Market Composite Index (PHISIX) averaged about 270.79 index points during 1995-99 as higher risk aversion and herding behaviour by investors during the 1997 Asian financial crisis reversed portfolio equity flows. The next four years (2000-03) were more stable, with average volatility of 169.22 index points despite the political and security concerns during the period. The local stock market has generally been stable during the past two years due to positive macroeconomic developments in the Philippines.

Table 7
PHISIX average volatility¹

	Average
1995-99	270.788
2000-03	169.2225

¹ Standard deviation of the daily PHISIX (Philippine Stock Market Composite Index).

Source: Bangko Sentral ng Pilipinas.

3. Real effective exchange rate (REER)

The surge in capital inflows during the first half of the 1990s led to a nominal appreciation of the peso. Inflation during this period was moderate despite the rapid growth of money supply as the economy was undergoing financial deepening and the demand for money increased. The moderate level of

inflation combined with the nominal appreciation of the peso contributed to a real appreciation in the REER index of the peso against the currency baskets of its major trading partners (MTPs) and competitor countries (CCs) (Table 8).

Table 8
Average real effective exchange rate index of the peso

Dec 1980 = 100

	Level			Change, in per cent		
	Major trading partners ¹	Competitor countries		Major trading partners ¹	Competitor countries	
		Broad ²	Narrow ³		Broad ²	Narrow ³
1990	69.20	86.90	124.41	-2.14	-2.97	-0.97
1991	68.18	84.32	126.38	-1.47	-2.97	1.58
1992	76.37	92.68	140.70	12.01	9.91	11.33
1993	74.15	91.48	133.76	-2.91	-1.29	-4.93
1994	79.57	95.75	141.92	7.31	4.67	6.10
1995	84.30	102.20	146.36	5.94	6.74	3.13
1996	90.53	106.57	147.11	7.39	4.28	0.51
1997	88.08	107.09	156.26	-2.71	0.49	6.22
1998	69.00	122.24	218.11	-21.66	14.15	39.58
1999	73.95	117.89	189.70	7.17	-3.56	-13.03
2000	68.68	109.54	169.97	-7.12	-7.08	-10.40
2001	64.19	113.84	180.49	-6.54	3.92	6.19
2002	63.41	106.48	161.41	-1.21	-6.47	-10.57
Oct 2003	57.40	99.24	145.21	-10.50	-7.68	-11.17

Note: Deutsche mark rates derived by dividing the euro-dollar rate by a fixed euro-Deutsche mark rate.

¹ Euro area, Japan, United Kingdom, United States. ² Hong Kong SAR, Indonesia, Korea, Malaysia, Singapore, Taiwan (China), Thailand. ³ Indonesia, Malaysia, Thailand.

Source: Bangko Sentral ng Pilipinas.

Meanwhile, the slowdown in capital inflows and the eventual reversal to outflows which occurred during the period 1997-2003 led to a depreciation of the REER of the peso against the MTP basket of currencies. Against CCs, the peso initially lost competitiveness as the REER for the broad and narrow baskets of CCs appreciated during the second half of the 1990s. This was due to the greater nominal depreciation of CCs against the US dollar. However, during the last three years, the REER against the broad and narrow baskets of competitor currencies has posted depreciations, due mainly to the nominal depreciation of the peso against the currencies in these baskets and the narrowing of the inflation differentials.

4. Asset price inflation

The surge in capital flows and the growth of the economy were also accompanied by a rapid rise in real estate prices. Selected real property prices in the central financial districts in Metro Manila, Philippines are shown in Table 9.

Table 9
Selected indicators of real property prices in the Philippines
Pesos/sqm

	Commercial land values		Residential capital values ¹	Residential rental values ²
	Makati ³	Ortigas	Makati	Makati
1991	80,000	45,000	25,000	250
1992	83,500	50,000	30,000	310
1993	111,500	60,000	34,000	275
1994	182,500	75,000	36,500	300
1995	312,500	110,000	56,000	330
1996	412,500	180,000	64,000	460
1997	425,000	195,000	64,000	475
1998	312,500	120,000	74,000	500
1999	237,500	105,000	72,500	327
2000	223,125	98,750	70,834	369
2001	180,000	80,000	65,000	358
2002	171,250	77,500	64,500	345
2003 ⁴	171,250	77,500	64,000	331

¹ Residential capital value is computed as price of floor area of commercial/residential condominium space. ² Monthly rental values. ³ For 1991-96, average commercial land values for the Ayala, Paseo de Roxas and Salcedo Village properties. For 1997 onwards, commercial land values for the whole Makati Central Business District (CBD), including Ayala, Paseo de Roxas and Salcedo Village properties. ⁴ As of March 2003.

Sources: 1991-97, Cuevo Far East, Inc, Metro Manila; August 1997, Market Overview; 1997-2002, Colliers Jardine Philippines, Inc.

Commercial real property prices in Makati and Ortigas peaked in 1997, having grown more than fivefold and fourfold, respectively, from the price levels in 1991. Residential property prices, on the other hand, peaked in 1998, increasing by about twice the price levels in 1991. Commercial and residential property prices showed a downtrend after 1997 amid investor fears of a property glut occurring in the country similar to that observed in countries more severely affected by the Asian crisis.

The trend in capital flows also partly influenced the performance of the domestic equity market (Table 10). The PHISIX surged by a record 154.8% in 1993 due to the sustained single digit inflation rate, higher GNP growth and significant structural reforms undertaken since the start of the 1990s. Among the important reforms which contributed to brisk activity in the stock market were the liberalisation of foreign investments and the lifting of foreign exchange restrictions. In late 1994 and 1995, however, the PHISIX posted declines of 14.1% and 6.9%, respectively, due to both external (Mexican crisis and fall of Barings) and domestic factors (build-up in inflationary pressures and pending implementation of an oil price hike). The market posted a modest recovery in 1996 but lost momentum in 1997 during the Asian financial crisis. Some strengthening was experienced in 1998 and 1999 with a decline in interest rates and the restoration of some stability in the foreign exchange market. The recovery in the market was, however, not sustained as domestic political and security concerns and global uncertainty tempered investor activity in the equity market from 2000 until late 2003.

Table 10
Stock market for the period 1990-2003

	PHISIX	
	Level	Growth rate
1990	653.1	-41.2
1991	1,154.3	76.7
1992	1,272.4	10.2
1993	3,241.9	154.8
1994	2,785.8	-14.1
1995	2,594.2	-6.9
1996	3,170.6	22.2
1997	1,869.2	-41.0
1998	1,968.8	5.3
1999	2,143.0	8.8
2000	1,494.5	-30.3
2001	1,168.1	-21.8
2002	1,018.4	-12.8
Oct 2003	1,399.1	37.4

Source: Bangko Sentral ng Pilipinas.

Policy responses to the increase in the magnitude of capital flows

The increase in the magnitude and the reversal of capital flows brings to the fore various issues that need to be addressed by monetary authorities. The impact of capital flows on liquidity growth, degree of dollarisation and financial markets required adjustments in the conduct of monetary policy. Another response undertaken by monetary authorities to the rise in capital flows was the strengthening of the domestic financial system. These adjustments in monetary and financial sector policies were further complemented by, among others, initiatives to improve the monitoring of capital flows and the development of early warning systems.

Implications for the conduct of monetary policy in the Philippines

Greater financial integration means increased inflows of capital that can ease the foreign exchange requirement of a country. However, the inflows, by their sheer magnitude, could have some destabilising effects on the economy that would complicate the task of monetary and exchange rate management.

During the surge of inflows in the early to mid-1990s, there were concerns that the appreciation of the peso might adversely affect the country's competitiveness. Some participation in the foreign exchange market by the BSP, through dollar purchases, was required to stem the sharp strengthening of the peso and avoid a substantial loss in competitiveness. While such action addresses the competitiveness issue, there were concerns that the accommodation of the capital inflows by the monetary authorities might lead to expansion in liquidity and create inflationary pressures. However, the monetary authorities noted that the economy was undergoing a period of financial deepening and that the demand for money was expanding. The financial deepening was indicated by the notable rise in both the M4/GDP and M3/GDP ratios during the first half of the 1990s as the economy was undergoing a process of financial liberalisation (Table 11). It was also noted that the acceleration in the expansion of domestic liquidity, particularly in 1993-95, was not accompanied by a significant

uptick in inflation. Thus, some additional expansion in domestic liquidity might not necessarily be inflationary, as this was used to support the expansion of activities in the economy. Accordingly, monetary policy partly accommodated the capital inflows and tolerated some uptick in the growth of money supply. The BSP built up its net foreign assets with the impact on domestic liquidity only partially sterilised. Changes in the net domestic assets of the BSP did not completely offset the increases in its net foreign assets (Table 12). This approach allowed the provision of adequate liquidity to support economic growth while ensuring that inflation objectives were achieved.

Table 11
Indicators of financial deepening, 1990-2002

	M4/GDP	M3/GDP	M4 growth	M3 growth	Inflation
1990	33.82	27.90	22.36	18.36	13.20
1991	34.00	27.81	16.46	15.48	18.50
1992	35.50	28.51	13.09	11.04	8.60
1993	41.81	32.58	28.48	24.64	7.00
1994	45.27	35.89	24.32	26.50	8.30
1995	50.79	39.95	26.32	25.31	8.00
1996	55.20	40.58	23.84	15.76	9.10
1997	61.79	43.93	25.06	20.95	5.90
1998	60.88	42.95	8.21	7.37	9.70
1999	63.38	45.86	16.29	19.27	6.70
2000	60.02	42.55	6.71	4.56	4.40
2001	57.47	41.51	4.85	6.84	6.10
2002	57.13	41.51	8.86	9.48	3.10

Source: Bangko Sentral ng Pilipinas.

Table 12
Change in net foreign assets and net domestic assets of the BSP
In billions of pesos

	NFA	NDA
1991	71,997	-51,355
1992	106,711	-91,236
1993	18,607	8,301
1994	35,015	-24,348
1995	26,572	3,750
1996	114,316	-83,793
1997	-20,776	43,978
1998	21,341	-47,973
1999	120,673	-38,775
2000	54,454	-67,973
2001	-13,525	18,185
2002	82,382	-39,171

Source: Bangko Sentral ng Pilipinas.

During the second half of the 1990s, Philippine policymakers again faced conflicting policy choices in times of sudden reversals of capital flows and exaggerated fluctuations in the foreign exchange rate. On the one hand, tight monetary policies were required to adjust to the diminished demand for domestic assets, limit the extent of exchange rate depreciation, and contain inflationary pressures. On the other hand, tight monetary policy could create an adverse impact on corporate and financial health. The BSP undertook a delicate balancing act of limiting the depreciation of the currency and the rise in interest rates. The goal was to allow some depreciation and accept a temporary rise in interest rates to restore stability in the foreign exchange market and at the same time limit the adverse effects on the balance sheets of banks and corporates.

In January 2002, the BSP formally shifted to an inflation targeting framework from a monetary aggregate targeting approach in formulating monetary policy. The shift in the policy framework was prompted by the observation that the historical relationship between inflation and money supply had weakened, thus undermining the effectiveness of a monetary aggregate targeting policy framework. This weakening of the link between inflation and money supply could partly be attributed to the effects of financial liberalisation, such as the emergence of new financial products and increased financial integration.

Under the inflation targeting framework, capital flows can have important implications for monetary policy formulation. They influence monetary policy essentially because of their impact on exchange rates, which in turn affect domestic prices. Massive and sudden outflows of foreign funds result in volatile exchange rates affecting import prices and inflation. Current estimates of the exchange rate pass-through into inflation in the Philippines indicate a minimal influence on consumer prices. Sensitivity analysis shows that a one-peso depreciation against the dollar leads to about a 0.11 percentage point cumulative annual increase in inflation. However, if exchange rate movements subsequently lead to wage and oil price adjustments, then the impact on inflation would be higher. Statistical exercises estimate that a one-peso depreciation against the dollar combined with a 1% increase in domestic oil prices lead to about a 0.16 percentage point cumulative annual increase in inflation. Meanwhile, a 1% increase in wages increases inflation by an average of about 0.065 percentage points over a 12-month period.

Another channel through which capital flows can affect prices and inflation expectations is the interest rate channel. An outflow of capital or a drop in access to foreign financing would imply a corresponding increase in demand for domestic financing, from both banks and non-banks. If the domestic liquidity situation is tight, the loss of access to foreign capital may lead to an increase in interest rates and can have inflationary repercussions.

Finally, capital flows can affect the conduct of monetary policy through their direct impact on money supply, which, in turn, can possibly affect future inflation outcomes. Significant capital flows influence domestic liquidity via changes in net foreign assets and this impact is monitored by monetary authorities. Moreover, increased capital flows can also have important implications on how we measure liquidity in the economy. As the use of foreign exchange in domestic transactions becomes more widespread, the measure of monetary aggregate should include a foreign currency component. Thus, monetary authorities are now monitoring developments in M4, which includes foreign currency denominated deposits held by residents, and assessing their impact on the inflation outlook.

Promotion of the stability and efficiency of the domestic financial system to support stable capital flows

The new globalised economic environment has created opportunities as well as risks in the financial system. The risks have been highlighted by the impact of the 1997 Asian crisis on the banking system. For example, as the performance of the corporate sector slowed down and the property market declined, the quality of banks' loan portfolios significantly deteriorated (see Table 13 in the next section). However, the impact of the crisis on the banking sector was not as dramatic as that observed in the other crisis-hit countries. This may be attributed to the fact that other countries experienced a surge in capital flows earlier than the Philippines (see, for example, Table 1). Thus, the Philippine banking system was not as exposed as those in the other countries, such as in the property sector or in accumulating foreign exchange liabilities.

In response to the distress experienced in the banking sector, the BSP embarked on an aggressive and wide-ranging reform process. It adopted changes in the regulatory and supervisory framework to be able to effectively meet the demands and challenges of globally integrated financial markets and the growing sophistication of financial products and services. This process of reform is geared towards

greater commitment to risk management, strengthening of the regulatory framework and supervision techniques, promotion of transparency and good corporate governance, and putting in place the necessary infrastructure requirements. The BSP, working closely with the banking sector, has made important progress on these fronts.

The umbrella for the reform process was the enactment of the General Banking Law (GBL) in May 2000. This legislation amended the old banking law and comprehensively updated the basic legal framework for the regulation and supervision of the banking system. The law provided for the enhancement of the supervisory capability and enforcement powers of the BSP, the improvement of prudential and regulatory standards, and the encouragement of greater competition in the financial industry. Some of the specific features of this new law include:

- granting authority to the Monetary Board to require banks to adopt internationally accepted standards relating to risk-based capital adequacy;
- providing for stricter rules governing bank exposure to directors, officers, stockholders and related interests (DOSRI);
- strengthening current regulations with respect to transparency practices;
- adopting fit-and-proper rule tests in the appointment of bank directors and senior bank officials; and
- liberalising further the ownership participation of foreign banks in the local banking system to 100% within seven years of the Act coming into force.

In terms of upgrading the regulatory framework, the BSP adopted a risk-based approach to bank supervision to effectively manage risks inherent in today's highly complex financial environment and avoid potential bank as well as systemic problems. A key element of this approach is the introduction of a risk-based capital adequacy framework consistent with international best practice.⁹ Initially, the new capital requirement covers only credit risk and prescribes a 10% risk-based capital ratio on a solo and consolidated basis.¹⁰ Recently the BSP released the guidelines for incorporating market risk into the capital adequacy framework.

The emergence of financial conglomerates also raised concerns on the effectiveness of the traditional approach to managing banking risks. Thus, the BSP implemented a consolidated approach to supervision. With this approach the BSP has strengthened its regulatory oversight by having a more comprehensive assessment of the risks involved in the activities of financial groups.¹¹

Furthermore, to avoid systemic failures, the BSP launched intensive monitoring of banks by improving its on- and off-site surveillance system, adopting a proactive approach in managing problem banks, and designating specialised prompt corrective action units to handle potential problem banks.

To facilitate the efforts by banks to improve the quality of their loan portfolios, the BSP supported the passage of the Special Purpose Vehicle Act (SPVA) of 2002. The SPVA provides tax incentives to facilitate the establishment of private sector led asset management companies which would buy banks' non-performing assets and enable banks to clean up their balance sheets. Already, two asset management firms have registered with the Securities and Exchange Commission since the enactment of the SPVA. There are no transactions yet involving the bulk transfer of non-performing assets of banks but there are ongoing negotiations, primarily on pricing differences. In a survey conducted by the BSP in August 2003, about 20 commercial banks expressed intentions to avail themselves of the benefits provided under the SPVA.

⁹ The legal basis for the risk-based capital requirement is embodied in Section 34 of the General Banking Law of 2000.

¹⁰ Circular no 280 dated 29 March 2001 contained the guidelines on the risk-based capital adequacy framework which initially covered only capital requirements for credit risks. Circular no 360 dated 3 December 2002 specified the guidelines to incorporate market risk into the framework for universal and commercial banks.

¹¹ In fact, the BSP reorganised its departments under the Supervision and Examination Sector (SES) and a regrouping of the banks assigned to the various bank examination departments whereby parent banks are grouped with their subsidiaries and affiliates in line with consolidated supervision.

The BSP also strengthened and aligned its prudential standards with international norms for better corporate governance, greater transparency and reduced moral hazard. These measures highlight the fundamental obligation of the board of directors that it is held primarily responsible for the proper governance of the bank. Some of the specific initiatives to this end include:

- expanding the duties and responsibilities of the board of directors to achieve a more prudent and efficient administration of banks;
- requiring directors to attend special seminars on corporate governance;
- requiring the election of independent directors as members of the boards of directors of banks;
- selecting external auditors with a high level of competence and integrity; and
- adopting sound accounting rules in the compilation of financial statements, including those relating to classification of loan account, loan loss provisioning and loan restructuring.

Support infrastructure was upgraded to make the financial system more efficient. Along this line, the BSP initiated the upgrading of the existing payment system to a real-time gross settlement (RTGS) system. The Philippine RTGS, also known as the Philippine Payment System or PhilPASS, was formally launched in December 2002. It is expected to minimise systemic risk as it allows real-time high-value payments between banks to be made using their deposit accounts with the BSP.

To contribute to raising the quality of credit ratings the BSP issued a set of rules and regulations that will govern the recognition and derecognition of domestic credit rating agencies for bank supervisory purposes. The rules and regulations prescribe that:

- an applicant rating agency will be recognised by the BSP upon satisfaction of the minimum eligibility criteria, which include, among others, objectivity, independence, transparency, credibility, and compliance with internal procedures and certain disclosure requirements;
- while no minimum capital is required, credit rating agencies should have the financial capability to invest in the necessary technological infrastructure and employ sufficient professional analytical staff to ensure proper discharge of their duties and responsibilities; and
- existing credit rating agencies should have a track record of at least five years in the issuance of reliable and credible ratings, while in the case of new entrants, a probationary status may be granted on condition that they employ professional analytical staff with sufficient experience in the credit rating business.

The adoption of the criteria for the accreditation of credit rating agencies will help ensure that the reliance of industry players and regulators on their ratings is well placed.

Another measure that contributes to the build-up of market infrastructure is the establishment of the Fixed Income Exchange by the Bankers Association of the Philippines (BAP). At the time of writing there was no organised venue for the trading of debt securities, with Government Securities Eligible Dealers (GSEDs) and other SEC-registered selling agencies facilitating the trading of government and corporate instruments. To address this concern the BSP supported the establishment of an alternative fixed income exchange (FIE) that will provide the platform for the secondary trading of private and public fixed income securities such as government securities, commercial paper and asset-backed securities issued by companies.¹² The setting-up of the FIE will promote transparency and price

¹² In relation to this, the Monetary Board, in May 2003, approved the BAP proposal for the BSP to act as a central custodian of banks' proprietary holdings of government securities. At present, these are held electronically at the Registry of Scripless Securities of the Bureau of the Treasury (BTr), which registers the ownership of uncertificated and scripless government securities by debiting or crediting the respective securities account of the banks that are RoSS members while the cash settlement is performed by the BSP upon the advice of the BTr. The BSP's custodianship will effectively eliminate settlement risk, as there will be simultaneous execution of cash and government securities settlement by one institution. The BSP can also do the marking-to-market of securities for a credible valuation of banks' government securities holdings. The Monetary Board also approved in principle the operational framework of the Philippine Depository and Trust Company (PDTC) to provide a central securities depository and registry system, among others. Moreover, in July 2003, the BSP issued regulations allowing universal/commercial/thrift banks to invest in the FIE.

discovery in fixed income securities and further boost the deepening of the capital market. The growth of the capital market is expected to reduce the reliance on bank lending for credit.

Improvements in the monitoring and transparency of capital flows

In response to the increase in the volume of capital flows, there is a need to upgrade monitoring and transparency mechanisms with respect to such flows. A timely and comprehensive set of data on capital flows is important in guiding policymaking and in facilitating the functioning of markets. Information on capital flows can help economic authorities anticipate possible exchange rate movements or evaluate access conditions in international capital markets. Transparent data on capital flows can also help investors in evaluating the sustainability of a country's external imbalances and economic prospects. To help reduce external vulnerability, the BSP has been strengthening its capacity to monitor capital movements and improving its balance of payments statistics. Monetary authorities are closely monitoring the magnitude and maturity profile of external obligations to avoid any bunching of maturities. Moreover, advance portfolio investment data from top custodian banks are being used and certain data are being incorporated into existing reporting requirements submitted by banks to the BSP to serve as early signs of any shifts in investor sentiment.

To improve the transparency of economic information, the Philippines started subscribing to the IMF's Special Data Dissemination Standards (SDDS) in 1996. By January 2001, the Philippines was in full compliance with the SDDS in the dissemination of the relevant data through the internet in accordance with the prescribed timeliness and frequency. The BSP's participation in the SDDS has enhanced its capability to generate accurate and comparable macroeconomic and financial information on a regular and timely basis. This will contribute significantly to improving the quality and depth of its early warning system database.

To facilitate the adoption of international norms, the Philippines is also participating in the formulation of Reports on the Observance of Standards and Codes (ROSCs). These reports will assess the extent to which the Philippines conforms to various key international standards and codes that are relevant to the effective functioning of its economic and financial system.¹³ Recently, the Data Module of the ROSC was conducted for the Philippines, aimed at inducing improvements in data needed by market participants and other users.¹⁴ Resulting gains in transparency are expected to enable market participants and others to formulate better analysis, forecasts and investment decisions, thus reducing uncertainty and helping investors price risk on a sounder basis. The module covered assessment of dissemination practices as well as data quality for national accounts, consumer prices, producer prices, balance of payments, government finance, and monetary statistics.

To complement the activities under the ROSCs the Philippines is also participating in the IMF-World Bank Financial Sector Assessment Program (FSAP), which is aimed at providing a comprehensive assessment of the strengths, risks and vulnerabilities of the financial system. The BSP and the Department of Finance agreed to a phased implementation of the FSAP, with the first mission having visited the country in October 2001. The results of the exercise are expected to help the national authorities identify and prioritise policy responses to enhance the efficiency and improve the resiliency of the financial sector against economic and other disturbances. Furthermore, the FSAP will also guide the IMF and the World Bank in their provision of development and technical assistance to the Philippine financial sector in the future. The FSAP mission in the Philippines recognised the important reforms in the financial sector that have been implemented and are still being pursued by the

¹³ Initially, the Philippines participated in the experimental stage of the ROSCs and was benchmarked against the standards and codes in the areas of corporate governance, accounting and auditing, and insolvency and creditor rights. The Philippine ROSC on Corporate Governance, which was released in September 2001, cited the advances made by the Philippines in the formation of bodies focused on governance issues (eg the Philippine Commission on Governance and the Institute for Corporate Directors) and the implementation of legal and regulatory reforms (eg the Securities Regulation Code). To strengthen the Philippine corporate governance system, the report suggested that further measures need to be pursued relating to issues on disclosure of non-financial information, strengthening the rights of shareholders, enhancing the role of boards of directors and ensuring the independence of audit. Three ROSC modules have been completed for the Philippines to date: Fiscal Transparency (5-18 September 2001); Monetary and Financial Policy Transparency (latter part of 2001); and the Data Module (1-16 September 2003).

¹⁴ The assessment of data quality was based on the Data Quality Assessment Framework (DQAF) developed by the IMF Statistics Department and focused on methodological soundness, accuracy and reliability, serviceability and accessibility.

authorities. At the same time, the mission emphasised the need to strengthen the supervision and resolution framework, including a more defined and explicit prompt corrective action framework as well as legal reforms to strengthen the enforcement powers of supervisory authorities. In this regard, the BSP is currently reviewing its prompt corrective action framework while the initiative to enhance its supervisory powers is included in the amendments to the New Central Bank Act being supported by the BSP.

The Philippine government also created an Investor Relations Office in July 2001 to formalise and facilitate active dialogue between government authorities and market participants. This serves as a mechanism for the government to identify early signs of concerns on the part of market participants, and thus help prevent crises. Information generated from this arrangement can provide important inputs and helpful validating tools for the BSP's early warning systems.

Early identification of vulnerability to external crises

The magnitude and volatility of the capital flows in the past decade underscores the need for developing early warning indicators to anticipate foreign exchange and banking crises and to complement traditional macroeconomic models. At international level, multilateral institutions (eg the IMF, ADB and BIS) have been developing indicators and undertaking surveillance and monitoring activities.

The BSP has developed a Bank Failure Early Warning System. The Bank Failure EWS produces a one-year ahead forecast of a bank's solvency.¹⁵ The adoption of this EWS allows the BSP to prioritise its supervisory focus to the most vulnerable banks based on the results and to initiate prompt corrective measures to prevent a larger problem down the road. The BSP is also currently developing an EWS for the Philippine economy that will identify in advance the vulnerable areas of the economy and alert the authorities in the event of an impending macroeconomic or financial crisis.

Has the banking sector become more resilient?

Having pursued a wide-ranging set of reforms, is the banking sector now more prepared to withstand the adverse effects of large and volatile capital flows?

The regulatory and supervisory framework for banks has improved with the changes that are being implemented as outlined in the previous section. The shift to risk-based supervision, the adoption of consolidated supervision and the development of an early warning system place the supervisory authorities in a better position to identify emerging weaknesses at both the institutional and sectoral levels of the financial system. Moreover, the BSP is seeking amendments to the New Central Bank Act of 1993 to further strengthen the supervisory capability of the central bank. Important reforms being proposed in this regard involve: (1) providing the BSP with sufficient flexibility to conduct banking examinations depending on bank risk profile; (2) implementing prompt corrective action in the case of problem/distressed banks; and (3) imposing stronger criminal and administrative penalties for violation of banking laws and regulations.

In terms of the performance of financial institutions, banks in the Philippines have made some progress in recovering after the 1997 Asian financial crisis (Table 13). The liquidity of the banking system has been steadily increasing since the crisis as banks build up investments in risk-free government securities and cash positions. The banking system is also adequately capitalised as capital ratios remain above the 10% minimum requirement. The resiliency of the banking system is further seen in the improvement of bank profitability in 2001 and 2002 after a string of earnings contractions in 1998-2000. Profitability was buoyed by non-interest income, particularly trading gains

¹⁵ The EWS produces a one-year ahead forecast of a bank's Residual Capital Cover (RCC) ratio, a variable constructed to proxy for bank solvency. Conceptually, the RCC represents the residual capital after non-performing assets are written down in proportion to net assets. A negative RCC value implies that bank capital is effectively wiped out. On the other hand, the larger the positive value, the more capital is available to back up assets. Referring to the Basel Committee recommendation of a minimum Tier 1 (core) capital of 4%, the critical RCC value should be at least positive 4%.

in government securities. Interest income, sourced mainly from the resurgence of credit card lending and the continued build-up of investments in government securities, grew only modestly. The improvement in the profitability of banks also reflects the diminishing impact of required provisioning on the bottom line of banks. As the non-performing loans (NPLs) of banks stabilise, the need for additional provisioning becomes less and this allows banks to register improvements in their net incomes.

Table 13
Selected financial ratios of the Philippine banking system
1990-March 2003

In per cent

	Liquidity (liq assets/ liq liabs ¹)	Profitability		Capital adequacy		NPL ratio ⁴	Total loan provisions ⁵ / Total loans	Total real estate loans ⁶ / Total loans (w/out IBL)
		ROE ²	ROA ³	Old	New			
1990	56.1	24.6	3.1	18.0	...	7.9	4.4	...
1991	54.7	20.5	2.8	19.5	...	7.3	3.8	...
1992	53.2	17.3	2.4	20.2	...	6.8	3.3	...
1993	44.7	15.1	1.9	19.2	...	5.3	2.5	...
1994	44.3	15.4	2.0	18.6	...	4.7	2.0	...
1995	39.9	14.8	2.1	18.8	...	4.0	1.7	...
1996	35.8	16.4	2.2	16.8	...	3.5	1.4	...
1997	33.7	12.4	1.7	16.0	...	5.4	2.3	...
1998	36.2	5.8	0.9	17.7	...	11.0	4.0	...
1999	36.7	2.9	0.5	17.5	...	12.7	5.8	13.5
2000	39.7	2.6	0.4	16.2	...	15.0	6.5	12.7
2001	42.0	2.9	0.5	16.1	14.5	16.9	7.6	12.3
2002	45.2	4.8	0.8	16.7	15.7	14.9	7.5	11.9
2003	45.9	1.6	0.3	17.0	16.8	14.9	7.4	11.78 ⁷

¹ Computed as (total liquid assets/total liquid liabilities)*ROA. ² Computed as (total assets/total capital)*ROA. ³ Computed as (net profit before tax/total assets). ⁴ Latest NPL ratio is as of August 2003. ⁵ Latest loan loss provisions ratio is as of August 2003. ⁶ Real estate loans before 1999 was included under the item "Financing, insurance and business services". ⁷ As of June 2003.

In terms of covering foreign exchange risk exposures it may be observed that there has been an increase in hedging activities by both financial institutions and corporates. For instance, the volume of foreign exchange forward and swap transactions of commercial banks grew from about 21% of their foreign exchange transactions in 2000 to 22% in 2002 (Table 14).

Table 14
Volume of forward and swap foreign exchange transactions
of commercial banks

As a percentage of total foreign exchange transactions

	Forward	Swap	Total
2000	5.1	16.0	21.1
2001	4.7	16.9	21.6
2002	5.0	17.1	22.0

The asset quality of the banking system, however, remains a key issue that needs attention. Overall, the NPL ratio of banks has gone down from the peaks of late 2001 and early 2002 (Table 13). However, a significant decline in the magnitude of NPLs is needed to bring the ratio to more tolerable levels. The creation of private asset management companies, induced by the passage of the SPVA, can contribute to this effort. It may also be noted that while NPLs have improved, banks have been increasing their loan loss reserves, which has resulted in a higher loan loss reserves to loans ratio. Moreover, commercial bank lending to the real estate sector as a proportion of total loans has also declined, reducing the banking system's exposure to this business cycle-sensitive sector. Overall, the regulatory framework and the banking sector have undergone some adjustments to be better able to adapt to changes in capital flows.

Concluding remarks

The Philippines experienced surges in capital flows in the 1990s. These flows influenced the level of domestic liquidity, the volatility of financial markets, the trend in the real exchange rate and the growth of asset prices. In response, adjustments in the conduct of monetary policy were made by the BSP. The adjustments included partial sterilisation in times of heavy capital inflows and a balancing of interest rate increases and peso depreciation during periods of capital flow reversals. With the recent adoption of an inflation targeting framework, the BSP continues to monitor and assess the impact of capital flows on domestic prices through the exchange rate, interest rate and liquidity channels. The BSP has also embarked on a wide-ranging banking sector reform process. The reform process involves among others the strengthening of the regulatory framework, promotion of good corporate governance practices and improvements to the infrastructure. It is hoped that these initiatives will contribute in enhancing the economy's capacity to take advantage of the opportunities provided by a more integrated financial environment and in building resilience against the adverse effects of surges in capital flows.

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Globalisation, financial markets and the operation of monetary policy: the experience of Saudi Arabia

Muhammad Al-Jasser and Ahmed Banafe

1. Overview

The essence of globalisation is the integration of markets worldwide and the deepening of various interdependent relations. Financial globalisation (cross-border capital flows) and financial integration (capital market linkages) are closely related. Countries in the early stages of financial integration have been exposed to significant risks in terms of higher volatility of both output and consumption.

Financial globalisation since the mid-1980s has been marked by a surge in capital flows between industrial and developing countries. Although capital inflows have been associated with high growth rates in some developing countries, a number of them have also experienced periodic collapses in growth rates and significant financial crises. An overvalued exchange rate and a domestic lending boom in which financial institutions become overextended often precede a currency crisis. The ability of a developing country to derive benefits from financial globalisation and its vulnerability to the volatility of international capital flows can be significantly affected by the quality of both its macroeconomic framework and its institutions.

International financial integration helps promote domestic financial sector development, largely in industrial countries. The proliferation of financial and currency crises among developing economies is often viewed as a natural consequence of the “growing pains” associated with financial globalisation.

2. SAMA’s experience in a globalised environment

2.1 Financial integration (capital flows and markets)

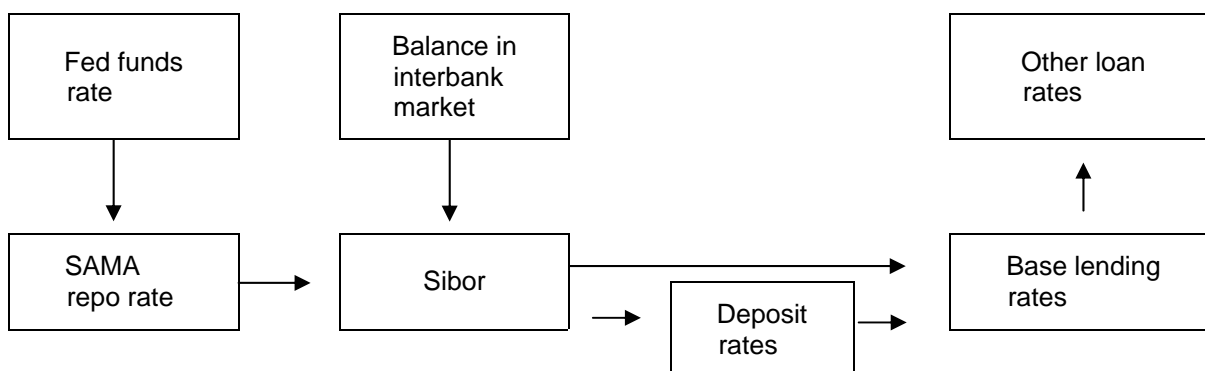
Saudi Arabia has been much less affected by external shocks and market volatility than have other emerging markets. This is because our policy preference has been to attract foreign direct investment, which serves both the investor and the domestic economy through joint ventures and transfer of technology. Saudi Arabia is gradually opening up its financial markets for portfolio investments. There are no restrictions on foreigners with regard to investing in government bonds but the stock market is not yet fully deregulated. Foreign investors can, however, invest in the stock market through open-end funds. The present regulatory structure of the market has shielded the country from disruptive capital flows. Furthermore, the domestic banks are net suppliers of funds in the interbank market, and the country as a whole is a net capital exporter. Corporate borrowing needs are largely met from domestic sources. Against this background, the question of “sudden stops in capital flows” is not relevant to Saudi Arabia.

With regard to the functioning of financial markets, the Saudi Arabian Monetary Authority (SAMA) believes in the free workings of the markets. There is no formal interest rate structure in Saudi Arabia. Policy operates by affecting the level of interbank liquidity through the repo window and thereby influencing the interest rate in the short-term professional money market. Capital expenditure and corporate borrowing for investment respond to banks’ commercial lending rates.

Interest rates in Saudi Arabia are influenced by two factors. First, Saudi Arabia is an open economy, with no restrictions on currency convertibility. The cross-border movement of funds responds to the differential between domestic and foreign returns. Second, the country has a pegged exchange rate system. Since June 1986, monetary policy has been directed towards keeping the exchange rate at USD 1 = SAR 3.75. The fixed exchange rate regime implies that Saudi Arabia’s financial market is highly integrated with external financial markets, and in particular the US market. In the domestic market, the arbitrage mechanism makes US interest rates the dominant factor in determining riyal interest rates. From time to time other factors have also been important, such as when large amounts of funds have been placed during share market flotations (eg in the early 1990s, when some banks floated shares to take advantage of the stock market’s star performance, and recently in late 2002, when Saudi Telecom Co (STC) was 30% privatised). In short, given the open capital account and the

credible fixed exchange rate system, the supply of funds in the interbank market is highly interest rate elastic. Any significant difference between domestic and comparable US interest rates tends to spur a cross-border movement in funds (swift asset substitution for incremental returns). At times the exchange rate link means riyal rates are at odds with domestic macroeconomic considerations (ie higher rates incompatible with subdued economic conditions).

Interrelationship of various interest rates



In Saudi Arabia, bank intermediation still dominates in channelling funds to various sectors of the economy because the bond market is still in the development stage and the equity market has overly conservative listing requirements. This will change following the recent enactment of the Capital Market Law and the formation of a Stock Exchange Commission.

2.2 Monetary policy (independence and operations)

Most central banks define independence as the capacity to set instruments and operating procedures (so-called instrument independence). By contrast, goal independence tends to be important to central banks in particular circumstances. Based on the above characterisation, SAMA is an independent central bank in its own right. Its immediate policy focus is to manage system liquidity on a day-to-day basis in a bid to contain wild fluctuations in money market rates and disruption to the smooth functioning of the interbank market. SAMA's intermediate target is exchange rate stability and the ultimate goal is price/financial stability. In fact, exchange rate targeting makes monetary policy less independent, and this is more pronounced in fixed exchange rate regimes. Lower riyal rates often trigger foreign exchange outflows due to interest rate arbitrage. On the basis of cost/benefit analysis, it is deemed appropriate to let riyal rates carry a small premium over dollar rates. In a global context, monetary policy is becoming more synchronised due to greater financial integration. Policy trends are clearly converging, with differences in the degree of accommodation. It may be noted that SAMA's conduct of monetary policy is not dominated by fiscal exigencies. SAMA does not seek to influence the yield curve to accommodate the government's cost of financing deficit, nor does it coerce banks into financing the budget deficit.

In our experience, higher foreign exchange reserves serve as a credible cushion for conducting monetary policy more flexibly. During the rudimentary stages of financial market development in the late 1970s and early 1980s, riyal rates were often posted below comparable dollar rates, mainly due to higher oil revenues, foreign reserve accumulation and government spending. As fiscal operations have significant influence on generating domestic liquidity and money supply, the riyal market remained overwhelmed with liquidity. However, the domestic banks' excess riyal liquidity management through foreign exchange swaps (ie lending riyals through the swap mechanism) yielded wild swings in the short-dated market. In order to mitigate the impact of the persistent liquidity stream and its attendant effect on the banks' balance sheets, the government ruled that contracts in excess of SAR 300 million would be denominated and paid in dollars.

SAMA introduced money market reforms in the early 1980s. It started offering Bankers' Security Deposit Accounts (BSDAs) in 1984 to better manage system liquidity. Subsequently, there was a noticeable improvement in liquidity management and predictability of short-dated rates. BSDAs were replaced with treasury bills in 1992. The 1990s witnessed a better structured domestic money market due to the expanded role of repos in managing system liquidity. In a narrow sense, SAMA's open market operations are restricted to day-to-day repo activity.

SAMA's intervention in the foreign exchange market can be described as both passive and active. As the government is the main earner of foreign exchange from oil exports, the private sector depends on the government to meet its foreign exchange requirements. SAMA, as the government's banker, sells dollars to domestic banks regularly (passive intervention). This is the underlying reason why the spot riyal trades around the official exchange rate of SAR 3.75 per US dollar. In times of uncertainty and speculative bouts against the riyal linked to soft oil revenues, forward foreign exchange prices are affected, as it is operationally convenient for market operators to trade through the forward market. Under extreme circumstances (1993 and 1998), SAMA has intervened in the forward foreign exchange market in modest amounts with a noticeable impact on forward prices. The timing and size of this intervention was linked to the cost of running short riyal positions and the post-intervention pace of changes in forward prices. Occasionally, SAMA has resorted to foreign exchange swaps to inject riyal liquidity to stabilise the money market.

2.3 Central banks and financial stability

The 1997-98 Asian financial crisis provided a stark demonstration of the destructive effects of financial instability. Price stability is certainly not a sufficient condition for financial stability. Banking problems of the 1990s warrant that, in the long run, financial and monetary stability should mutually reinforce each other. But, in the short run, easing monetary conditions may be an entirely appropriate response by central banks concerned about financial fragility spilling over into system-wide problems. The LTCM example, when the Federal Reserve eased monetary conditions to increase liquidity in the financial markets, is a case in point.

SAMA has long had a keen interest in financial stability. It acted as a source of emergency liquidity assistance (through soft deposit placements) to some of the banks facing acute liquidity problems or potential insolvency in the 1980s. Critics may regard such assistance as a source of moral hazard, but in a broader context it becomes imperative to save the system from systemic risk. Banking business is all about public confidence, and once this is eroded it becomes too painful to restore it. From experience, it is better to nip the problem in the bud rather than let it develop to the point of frustration. The recent episode of the Y2K scare and central banks' willingness to inject massive liquidity into the banking system confirms the notion that financial stability remains the core concern of monetary authorities. In a globalised economy, financial stability has become a central bank objective, and in this context pre-emptive policy actions to address potential instabilities are justifiable. In many cases, the explicit references to financial stability fall within the realm of banking and the efficient operation of the payment system.

Central bankers, however, do not subscribe to the BIS suggestion of considering asset prices in conducting monetary policy. The BIS favours prudential policy action in market upturns as well as against negative shocks. Central bankers appear to be extremely cautious about asset prices because assessing valuation is a very challenging exercise. It is not the asset price per se which is hard to determine, but its deviation from a highly hypothetical fundamental value. Central bankers are, therefore, against using highly volatile indicators in the measurement of price stability or in the conduct of sound monetary policy. Based on this logic, central banks' response to asset prices would be asymmetric.

3. Conclusion

The net benefit of globalisation differs within and among countries, depending on the mix of macroeconomic policies and trade regimes pursued by policymakers. Information technology and greater financial integration are influencing the conduct and effectiveness of monetary policy. Central banks are doing away with their earlier policy of ambiguity in favour of better transparency. Globalisation of financial markets has broadened opportunities for accessing capital funds and investments. In the aftermath of the 1997-98 Asian financial crisis, it has become quite obvious that financial stability is key to conducting monetary policy and achieving its primary objective (price stability).

In today's globally integrated markets it is important for central banks and other financial authorities to share information and to communicate on crisis prevention measures. In this regard, the BIS has been instrumental in providing central banks with background research on various central banking and market-related issues for discussion in their routine meetings.

The impact of globalisation on the formulation and implementation of monetary policy in Singapore

Ong Chong Tee¹

1. Introduction

Singapore's export-oriented growth strategy has yielded relatively high productivity and GDP growth since the mid-1970s. However, it has also increased the country's susceptibility to external shocks. In recent years, the globalisation process has exacerbated these shocks. With rising cross-border investment and stronger trade linkages, the business cycles of major industrial countries have become more synchronised. At the same time, the increased integration of world capital markets, with higher capital mobility and larger volumes of capital flows - particularly private flows - has created the potential for large and sudden reversals in such flows. Indeed, the Singapore economy has been hit by a series of shocks in close succession since 1997 - the downturn in the global electronics industry in 1996-97, the Asian financial crisis in 1997-98, the sharp downturn in US IT demand, the events of 11 September 2001 and, most recently, the outbreak of the Severe Acute Respiratory Syndrome (SARS) virus in April 2003.

Against this backdrop, this paper addresses the challenges posed by increased globalisation on the formulation and implementation of Singapore's monetary policy by the Monetary Authority of Singapore (MAS). Section 2 gives a brief overview of the monetary policy framework of Singapore. The issue of monetary policy formulation in the context of the greater volatility in the external environment and ongoing structural changes in the economy is taken up in Section 3, while Section 4 deals with some of the operational challenges posed by the various aspects of globalisation in the implementation of monetary policy. Finally, Section 5 argues that the judicious management of monetary policy needs to be supported by a framework of consistent macroeconomic and microeconomic policies and by strong institutions, in order to effectively meet the challenges of globalisation.² Section 6 concludes.

2. Brief overview of monetary policy in Singapore

Since 1981, monetary policy in Singapore has been centred on the management of the exchange rate. The primary objective has been to promote price stability as a sound basis for sustainable economic growth. The framework incorporates the key features of the basket, band and crawl (BBC) framework.³

First, the Singapore dollar (SGD) is managed against a basket of currencies of our major trading partners and competitors. The various currencies are given different degrees of importance, or weights, depending on the extent of Singapore's trade dependence on that particular country.

Second, the MAS operates a managed float regime for the SGD. The trade-weighted exchange rate is allowed to fluctuate within an undisclosed policy band, rather than kept to a fixed value.

Third, the exchange rate policy band is periodically reviewed to ensure that it remains consistent with the underlying fundamentals of the economy.

¹ Assistant Managing Director of the Monetary Authority of Singapore (MAS), with contributions from Tan Siang Meng and Tan Jo-Ann, at the Monetary Policy Division and Monetary Management Division respectively. The views expressed here are solely those of the authors and should not be attributed to the MAS.

² H E Khor and E Robinson, "Challenges for exchange rate in the emerging markets in Asia", paper presented at the South-East Asia Conference held at the Bank of England's Centre for Central Banking Studies, London, 12 June 2001.

³ E Robinson, discussion paper presented at conference on "Future directions for monetary policies in East Asia", Reserve Bank of Australia, 24 July 2001.

The choice of the exchange rate as the intermediate target of monetary policy is predicated on the openness of the Singaporean economy to trade and capital flows. Total exports and imports are each well in excess of 100% of GDP, while exports account for about two thirds of total demand. In addition, the import content of expenditures is relatively high at 51%. Changes in the value of the trade-weighted SGD therefore have a significant influence on inflation and GDP outcomes.

The trade-weighted exchange rate, or the SGD nominal effective exchange rate (NEER), is as close to an ideal intermediate target of monetary policy as we can expect for Singapore. It is relatively controllable and has a powerful and stable relationship with price stability, the final target of policy, over the medium term. More relevant to the present discussion, Singapore's monetary policy framework has also given the MAS the necessary flexibility to cope with the dynamics of a globalised economy, in coping with short-term volatility as well as in avoiding longer-term currency misalignments.

3. Monetary policy formulation in an increasingly globalised economy

Coping with short-term external shocks

The integration of international financial markets implies that shocks in one part of the world are readily transmitted to another. This poses challenges to monetary policy in Singapore. Nevertheless, the framework of the exchange rate-centred monetary policy has allowed us to accommodate to some extent the effects of these shocks while insulating the real economy from its potential destabilising impact. We highlight two aspects of this.

First, the basket characteristic of the managed float system has helped to build in some degree of flexibility in dampening the volatility in international currency markets, as compared to a situation in which the SGD was on a bilateral peg. Table 1 shows that the SGD has been less volatile with respect to the other currencies than if it had been pegged to any of the main currencies. For example, if the SGD were pegged against the US dollar, the monthly standard deviation against the yen and euro would have been 3.33% and 3.23% respectively, instead of 2.90% and 2.88%.

Table 1
Standard deviation of monthly currency movements since 1981
In per cent

Current basket managed float				Hypothetical dollar peg		
NEER	SGD/USD	SGD/JPY	SGD/DEM	USD/JPY	USD/DEM	DEM/JPY
1.46	1.56	2.90	2.88	3.33	3.23	3.04

The volatility of the SGD NEER as measured by its monthly standard deviation has also been significantly lower than that of the US dollar or yen. The standard deviation of the SGD NEER was 1.46% between 1981 Q1 and 2003 Q2, compared to 3.43% for the US dollar and 4.69% for the yen. At the same time, movements of the SGD against major currencies, especially the US dollar, have also been less volatile than movements among the major currencies.

Second, our experience has additionally shown that the presence of the exchange rate bands in the managed exchange rate float system has served as an effective shock absorber during periods of heightened market volatility. In such instances, there may be occasion to widen the band, as was done in October 2001 after the terrorist attacks in the United States and during the 1997 Asian crisis. In both cases, the bands were subsequently narrowed again when market and economic conditions stabilised.

In addition, in its six-monthly review of exchange rate policy, the MAS reassesses its monetary policy stance to ensure continued relevance to domestic economic conditions, against the backdrop of changing developments in the global economy. For example, in July 2001 the MAS shifted its policy stance from one of targeting a modest and gradual appreciation of the SGD NEER to a 0%

appreciation of the exchange rate given the sharp deceleration in growth in Singapore's main export markets, as well as the absence of inflationary pressures into the forecast period. This policy stance and its subsequent maintenance into 2002 and 2003 H2 were judged to provide support for the economic recovery in a low-inflation environment.⁴

Coping with structural developments

Over the medium to longer term, the managed float has provided the flexibility for the MAS to reflect the evolving global and domestic structural developments in exchange rate policy formulation. The MAS continually assesses the path of the exchange rate to ensure that it reflects underlying economic conditions. The "crawl" feature of the managed float system thus allows the equilibrium (real) value of the exchange rate to reflect changes in economic fundamentals, such as the trend increase in saving rates and strong productivity performance in the export sector. In addition, the composition of the basket of currencies and their respective weights are also periodically reviewed to incorporate evolving trade patterns. Since 1981, the trade-weighted SGD has been on a secularly appreciating trend in both nominal and real terms. This partly reflects the structural transformation of the Singapore economy over the years, from a predominantly low-skill, labour-intensive base towards greater capital and knowledge-intensive activity.

The MAS firmly believes that in the long run, export competitiveness can only be maintained if firms increase productivity, create new products and actively seek out new markets. Thus, it has deliberately not used the exchange rate as an instrument to manage Singapore's export competitiveness. Moreover, given that monetary policy affects the economy with long and variable lags, the exchange rate policy has a medium-term focus and is not intended for short-term adjustments. The result has been a stable SGD, low inflation, confidence in the currency and low interest rates. Where fundamental shifts are required to preserve the competitiveness of the economy, the government has taken steps to directly reduce wages and other domestic costs, as well as fine-tune various industrial policies, rather than place the burden of adjustment on the nominal exchange rate.

Research work at the MAS as well as the IMF has shown that the real effective exchange rate in Singapore has been aligned with the key underlying economic fundamentals. For example, the IMF, using an econometric model based on a set of fundamentals, showed that the actual and (estimated) equilibrium exchange rates have tracked each other fairly closely.⁵

4. Globalisation's challenges for the implementation of monetary policy

The increasingly globalised landscape has also presented challenges for the MAS in the implementation of its monetary policy. In recent years, the size of global capital flows, especially short-term flows, has increased. For example, the size of portfolio flows as a proportion of foreign direct investment has risen from an average of approximately 8% between 1996 and 1997 to about 21% in 2002. This has had implications for (i) the management of our monetary policy target - the SGD trade-weighted exchange rate, and (ii) the management of liquidity in the banking system, as explained below.

Challenges to exchange rate management

To ensure the effective management of the SGD trade-weighted exchange rate, the MAS has traditionally relied on three factors. First, the MAS has built up a large pool of official foreign reserves, which totalled SGD 143 billion or the equivalent of eight months of imports as at end-2002, to buffer any attacks on its currency. Second, it does not disclose the precise width of the bands within which

⁴ In addition, the MAS recentred the exchange rate band at the prevailing level of the exchange rate in January 2002 and July 2003.

⁵ International Monetary Fund, "Singapore: selected issues", *IMF Staff Country Report*, no 99/35, 1999.

the SGD NEER is allowed to fluctuate, to avoid drawing a “line in the sand” for speculators to target their attacks. Finally, the MAS currently maintains a policy on non-internationalisation of the SGD, which essentially restricts the lending of SGD to non-residents for speculation against the SGD.

Arguably, as the speed and volume of international capital flows rise, all three factors will be increasingly tested. Lending restrictions, like the SGD non-internationalisation policy, will also be increasingly undermined by the growth of offshore markets, which provide an alternative means of funding for currency speculators.

In response, some countries have imposed additional restrictions to insulate their economies from international capital flows. The MAS has chosen the opposite route, liberalising its SGD non-internationalisation policy further. Central to this strategy is the belief that allowing international investors and intermediaries to participate more freely in our domestic capital market will deepen the SGD currency market and make it more resilient to speculative attacks. Since 1998, the SGD non-internationalisation policy has been gradually liberalised. After March 2002, only two restrictions remain. First, SGD equity and bond issuers are required to swap or convert their SGD proceeds into foreign currency prior to use abroad.⁶ Second, Singapore-based financial institutions are not allowed to extend SGD credit of more than SGD 5 million to an external financial institution if there are reasons to believe that these funds are to be used for speculation against the SGD.

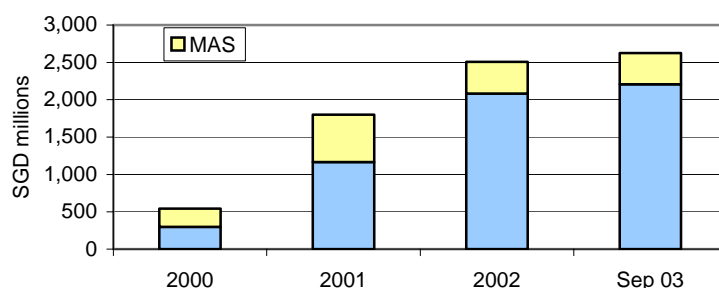
Challenges to SGD liquidity management

Being able to mitigate the impact of large capital flows on the exchange rate is only half of the equation. The fallout on liquidity in the banking system must also be managed.

In Singapore, liquidity in the banking system is managed through daily money market operations (MMOs). Prior to 1998, the MAS relied solely on foreign exchange swaps and uncollateralised (clean) lending/borrowing as tools for its MMOs.⁷ Both instruments trade in relatively well developed and deep markets, but they may not be adequate to handle large-scale liquidity operations. Foreign exchange swaps are generally traded on a next day value basis. Liquidity in same day value swaps is limited, especially in the afternoon session. The Singapore dollar’s entry into the Continuous Linked Settlement (CLS) system has further sapped liquidity because same day swaps cannot be settled in the system. Lending large amounts of funds clean is not desirable as it incurs large credit risks for the MAS. For the system as a whole, interbank credit exposures also rise as banks onlend funds from the MAS to other banks.

To enhance the MAS’s capacity for liquidity management, the sale and repurchase (repo) of Singapore Government Securities (SGSs) was introduced as an MMO tool in 1998. From non-existence, SGS repurchase volumes have experienced a fivefold increase since 2000; more encouragingly, the MAS volume as a proportion of the total market volume has fallen.

Graph 1
Average daily SGS repurchase volumes



⁶ After May 2004, this requirement only applied to non-resident, financial issuers of SGD equity and bonds.

⁷ The MAS uses indirect tools for its money market operations, as this accords us greater flexibility and is less disruptive on the banking system than direct tools such as reserve requirements.

Since SGS repurchases are traded on a delivery-versus-payment (DVP) basis, they incur much less credit risk, both for the MAS and for the system as a whole. But because the market is relatively immature, tenures beyond three months are still not well traded. Thus, for longer-term withdrawals or injections, the MAS still relies on foreign exchange swaps. In September and October 2003, not unlike many Asian economies, Singapore experienced a surge in portfolio inflows. To “mop up” excess liquidity, the MAS engaged in about SGD 15 billion of MMO, the equivalent of about 8% of the liability base. Of these 39% were in SGS repurchases, 37% in clean borrowing and 24% in foreign exchange swaps.

5. A multidimensional approach to exchange rate management

As noted in both Sections 3 and 4, Singapore’s ability to cope with the vagaries and dynamics of an increasingly globalised financial market cannot be simply attributed to the judicious choice of exchange rate regime and its implementation. Instead, the exchange rate system may be viewed simply as a “monetary overlay” on the real economy foundations, and therefore needs to be complemented with a framework of consistent macroeconomic and microeconomic policies and strong institutions. This view is perhaps succinctly captured by the following quote:

“... the choice of exchange rate regime is likely to be of second order importance to the development of good fiscal, financial, and monetary institutions in producing macroeconomic success in emerging market countries. This suggests that less attention should be focused on the general question whether a floating or a fixed exchange rate is preferable, and more on these deeper institutional arrangements. A focus on institutional reforms rather than on the exchange rate regime may encourage emerging market countries to be healthier and less prone to the crises that we have seen in recent years.”⁸

Some of the key support factors of relevance to Singapore’s experience are highlighted below.

First, strong emphasis is placed on running sound and credible macroeconomic policies to avoid the build-up of major macro-imbalances in the Singapore economy, which could lead to misalignments in the currency and invite speculative attacks. For example, prudent fiscal policy has absolved the MAS of the need to finance the government and allowed it to focus on its primary mission of maintaining price stability.

Second, and of equal importance due to Singapore’s small open economy and dependence on exports, is the flexibility of product and factor markets to cope with and adjust to shocks arising from the currency markets and swings in the terms of trade in world product economies. In particular, the labour and wage policies in Singapore have demonstrated significant flexibility in responding to the changing market conditions, through the unique harmonious tripartite industrial relationship, involving the government, the labour union and the employers.

Third, it is crucial to develop and strengthen financial systems in order to enhance their robustness to shocks. To do so, financial regulators must also consistently upgrade their supervisory capabilities to keep pace with financial innovations and the increasing complexity of financial institutions’ activities and products. In recognition of this, the MAS undertook a strategic review of its financial sector policies in 1997. Measures taken included efforts to develop bond markets, the asset management industry and the insurance industry, as well as to open up the domestic banking industry.

Finally, the MAS has recognised the importance of promoting greater disclosure and transparency to foster market discipline and reduce the likelihood of markets overreacting due to a lack of information or information asymmetries. For example, for financial markets in general, the MAS has raised bank disclosure standards and sought to improve corporate governance. On the monetary policy front, more information has been released on websites and in printed publications. One of the recent initiatives includes the decision to publish a *Monetary Policy Statement* soon after each semiannual review of exchange policy. The MAS has also published a monograph of its *Monetary Policy Operations* to

⁸ F S Mishkin and G A Calvo, “The mirage of exchange rate regimes for emerging market countries”, *NBER Working Paper*, no 9808, 2003 p 1.

provide the public with greater clarity on how monetary policy is implemented. These efforts have ensured that the financial markets and the public have a clear understanding and appreciation of the MAS monetary policy formulation process and the rationale for the policy stance.

6. Conclusion

The technical features of the managed float system have provided the necessary instruments to work towards the objective of sustainable non-inflationary growth in the context of the small and open nature of the Singapore economy. Furthermore, the MAS maintains robust foreign reserves and has broadened the range of money market tools used for its exchange rate management and money market operations. However, these conditions are not sufficient, and need to be complemented with sound economic judgment, enlightened discretion and constant vigilance in the light of increased volatility in both the real economy and the financial markets. In addition, the continued emphasis on maintaining strong macroeconomic fundamentals and robust financial institutions, coupled with the development of liquid and efficient capital markets, are also crucial underpinnings that would aid the successful operation of Singapore's monetary policy in an increasingly globalised world.

Globalisation, financial markets and the operation of monetary policy: the case of Thailand

Thirachai Phuvanatnaranubala

Overview

This paper seeks to clarify how monetary policy in Thailand has evolved in response to the challenges posed by globalisation. It explores the role and impact of globalisation and financial integration on Thailand's financial system and its implications for the economy over the last decade. Thailand's economic and financial landscape has changed dramatically over this period to cope with the financial sector restructuring which the country had to undergo during the 1997 crisis, the challenges of the economic and financial environment, including economic and financial reforms, and the global trend towards adoption of international standards and codes on transparency of the conduct of policies. This paper will illustrate the impact of globalisation on Thailand's financial system and the challenges for the Bank of Thailand (BOT) in conducting monetary policy. The paper recounts the events in three phases. The first phase covers Thailand's liberalisation and integration into the global financial markets in the 1990s. The second phase covers the financial crisis of 1997, and the third phase will cover the evolution of the financial system post-crisis under current economic developments. The paper will end with a look at the challenges ahead and ways forward.

1. Introduction

The 1990s saw dramatic changes in the liberalisation and internationalisation of emerging market economies. During this period, Thailand's financial system was gradually integrated into the regional and global system. The price system or the domestic interest rate structure was being set by market forces. Greater foreign participation was permitted while the scope of operation was enlarged and financial infrastructures strengthened. The aim was to ensure that the domestic financial system could effectively serve the needs of the production sector, making Thailand attractive to foreign direct investment and able to attract international capital, which had a lower cost than that from the domestic markets at the time. With a fixed exchange rate system, monetary policy operations revolved around the tasks of managing capital inflows through both foreign direct investment and foreign portfolio investments.

A new milestone in Thailand's economic and financial development was set by the events of the 1997 financial crisis. The Thai authorities had to redefine and review the appropriateness of the strategies current at the time. New mechanisms were put in place to safeguard the economy and financial system against external shocks and volatilities inherent in an open financial system, while at the same time attempting to restore economic and financial stability. This included reforms across sectors, covering social, economic and government reforms, and particularly reforms of the banking system. A dual track approach involving parallel efforts to develop both an export-led strategy and domestic grass-roots economies was adopted to revamp the domestic foundation while at the same time better preparing the country for re-entry into the global market.

At the time of writing, Thailand's economic growth path has been restored, with growth of 6.8% in 2003, inflation not posing an imminent threat and external conditions remaining strong. The new challenge facing us today is how to maintain this economic momentum of growth. On the external side, with the re-emergence of capital flows, the authorities need to remain vigilant and to be effective in the management of this increasing level of capital flows.

The objective of this paper is to capture the impact of globalisation on Thailand's domestic financial system and monetary policy through an analysis of financial and economic developments and the policy responses they elicit. Specifically, the paper attempts to address the following key questions. First, what triggered the changes? Second, and probably more importantly, what are the new

challenges that lie ahead? To answer these two questions, this paper carefully examines the evidence surrounding the economic conditions.

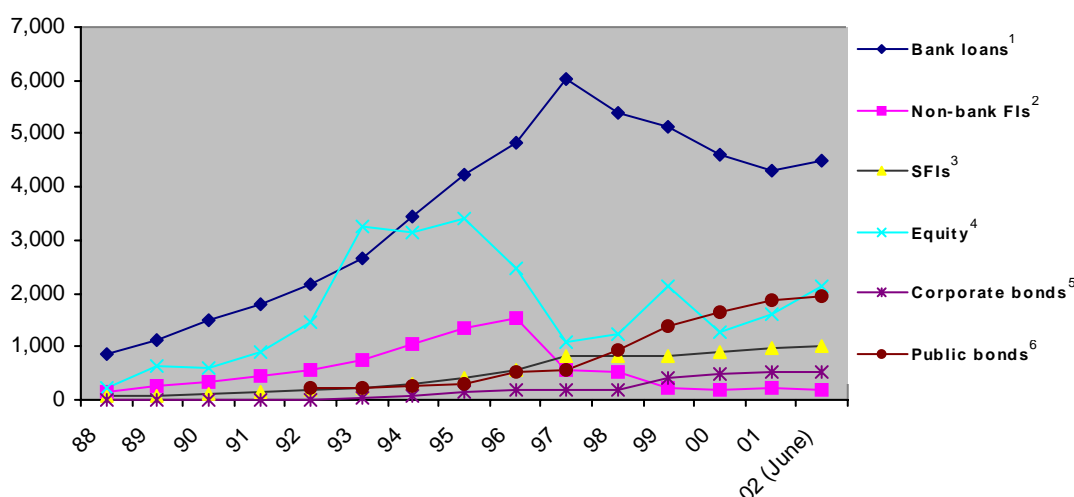
2. Evolution of Thailand's monetary/financial landscape: an overview

2.1 Phase I: the Asian miracle - the period of the impossible trinity

During the 1990s or the so-called period of the Asian miracle, the Thai economy was among the fastest-growing in the world, boasting double digit growth per annum, moderate inflation and a stable exchange rate. The Thai authorities managed the economy with a conservative fiscal policy and a basket-pegged exchange rate system as the anchor of monetary policy. Thailand experienced nine consecutive years of fiscal surplus between 1988 and 1996. The high investment rate in private enterprise investment, accounting for 40% of GDP, was financed by the high saving rates - intermediated almost exclusively via the banking sector - and the massive amount of capital flows which came in the form of both foreign direct investment and foreign portfolio investment.

Graph 1
Landscape of the Thai financial market 1988-2002

End-of-period value, in billions of Thai baht



Note: Data for banks, specialised financial institutions (SFIs) and non-bank FIs are as of May 2002.

¹ Bills, loans and overdrafts, excluding interbank transactions. ² Credit extended by finance, finance and securities, and credit foncier companies. ³ Credit extended by GSB, GHB, BAAC, EXIM Bank, IFCT and SIFC. ⁴ Stock Exchange of Thailand (SET) market capitalisation. ⁵ Corporate bonds outstanding at par value. ⁶ Data on outstanding public bonds before 1992 are not available.

Sources: BOT; SET; Thai Bond Dealing Centre.

During this period, the development of the Thai economy relied heavily on bank credits. This reliance on bank lending as a source for funds subsequently led to the underdevelopment of alternative domestic funding instruments, as demonstrated in Graph 1. With economic growth reliant solely on bank lending, there was very little development of the capital market.

Against this backdrop, commercial banks mobilised funds mainly through deposits, which accounted for roughly 80% of domestic banking liabilities. Commercial banks held almost 70% of total financial sector assets, mostly in the form of credits to the household and corporate sectors.

The effectiveness of the interest rate as an instrument for the conduct of monetary policy was limited under the basket-pegged exchange rate system and an open capital account regime. The rule of the impossible trinity implied that interest rates could not be used freely as an instrument of monetary policy. There was reliance on prudential measures such as the reserve requirement to manage

short-term capital flows and credit policy, safeguard against excessive capital inflows and ensure a broad-based development of the productive sectors. On a positive note, the regime enabled borrowers to access funds at lower cost and introduced some degree of stability and predictability to the exchange rate level. Increased integration of financial markets brought with it the challenge of managing increased volatility of capital movements and domestic interest rates. This came about as capital flows that entered the country came in the form of short-term bank loans and bills of exchange, all of which were subject to volatility and sharp reversals of flows. The structure of these inflows - mainly short-term loans - came about from a combination of factors, including the fixed exchange rate and the free flow of capital, as well as the availability of funds through the Bangkok International Banking Facilities (BIBF).

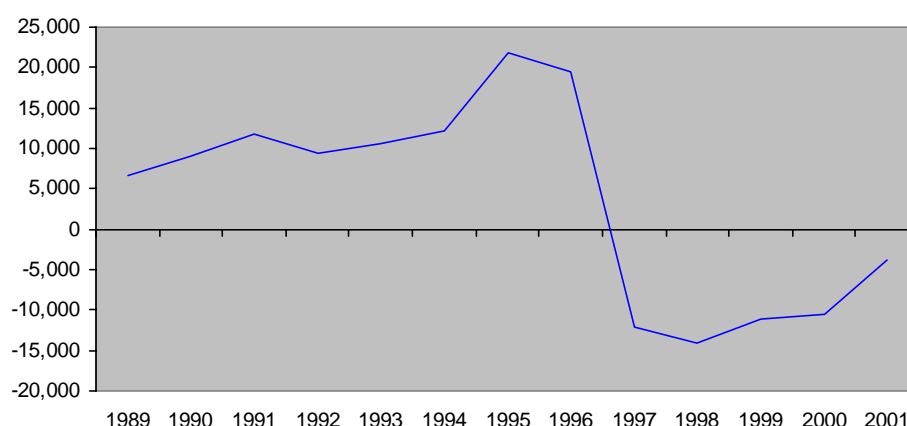
However, the extent of bank-based activity and inadequate supervision and regulation contributed significantly to the crisis. The over-reliance on banks combined with their role as intermediaries for the huge capital flows coming into the country overwhelmed the risk management capacity of banks. This fed through to banks' lending policies, leading them to "over-lend" to sectors, which they might not have done under normal circumstances. The suddenness of the reversal of capital flows meant that banks were unable to adjust their operations in time, leading to a liquidity crunch in many banks.

2.2 Phase II: the twin crises

The economic and financial crisis that hit Thailand in 1997 triggered a change in the perspectives and outlook of the authorities. As has been the case in numerous countries, the crisis acted as a catalyst to bring about a rethink and a reorientation in national strategies and policies. The challenge for the BOT, as the country's central banker, was unique. It needed to deal with the crisis in the banking sector as well as the consequences of the sharp devaluation in the currency. This event highlighted Thailand's linkage with the global market.

The challenges that we faced were the sudden stop and reversal of capital flows during the crisis. In 1998, Thailand experienced a sharp reversal in capital flows (Graph 2) accounting for 13.8% of GDP. This was in contrast to the net inflows of some 10% of GDP in 1996. The exchange rate depreciated sharply from around THB 25/USD to a low of THB 56/USD on 13 January 1998. As a result, the banking system, burdened with huge losses and non-performing loans (NPLs) as foreign currency loans contracted by debtors became unserviceable, could no longer act as the engine of financing as in the past.

Graph 2
Thailand's capital flows 1989-2001
In billions of US dollars



As the exchange rate became very volatile, monetary policy had to tighten to stabilise the baht, which had become volatile from the loss of investor confidence not only in Thailand, but in the region as a whole, as the effect of the financial crisis continued to sweep through other countries in the region. The immediate challenge for the authorities was how to restore economic stability.

2.2.1 Monetary policy adjustment

Given that a return to a fixed exchange rate was not considered a viable option in the light of the volatility of capital inflows and the unsettling experience from the recent crisis, the BOT recognised the need to find a new anchor.

In the interim period following the adoption of the floating exchange rate system on 2 July 1997 and the IMF programme, a monetary targeting regime was adopted. Under this regime, the Bank targeted domestic money supply using the financial programming approach in order to ensure macroeconomic consistency as well as to reach the ultimate objectives of sustainable growth and price stability. The Bank set the daily and quarterly monetary base targets, on which its daily liquidity management was based. Daily liquidity management was essentially intended to guard against excessive volatility in interest rates and liquidity in the financial system. However, this regime was deemed inappropriate owing to instability in the relationships between money aggregates and macroeconomic objectives reflecting rapid and ongoing changes in the financial system.

Towards the end of the IMF programme in 2000, and after careful consideration, the Bank of Thailand decided to adopt inflation targeting as a nominal anchor for its monetary policy framework.

2.2.2 Banking sector reform

The crisis made even clearer the degree of over-reliance of the Thai financial system on commercial banks in financing investment and economic growth, and highlighted the need to reform the domestic banking system. In a sense, Thailand managed to turn the crisis into an opportunity to reform the financial system. With commercial banks flooded with liquidity, demand for low-risk saving instruments also rose sharply to enable banks to invest the excess liquidity.

The crisis in the banking sector meant multiple tasks for the authorities: to stabilise, manage and strengthen the financial system as well as financial institutions. Measures implemented to reform and restructure the financial system included the suspension of operation of 58 finance companies with the Financial Institutions Development Fund (FIDF) as well as the creation of various organisations to deal with problems arising from the suspension, for example the Financial Sector Restructuring Authority (FRA), the Asset Management Corporation (AMC) and the Thai Asset Management Corporation (TAMC), to resolve the outstanding number of NPLs. Moreover, the capital bases of financial institutions were strengthened through a combination of new loan classification and provisioning and private sector led recapitalisation. Standards were tightened to be consistent with international standards and best practices. As a result, banks were required to recapitalise to meet these new standards, and those who failed to do so were taken over by the FIDF. Banks were also required to maintain a minimum capital adequacy ratio at 8.5% in line with the Basel Accord.

In addition, the restrictions on foreign ownership of Thai financial institutions were temporarily relaxed, allowing foreign investors to acquire major shareholdings for up to 10 years, with the actual holding of shares temporarily grandfathered thereafter (until the ratio is brought down to 49%). Furthermore, on 14 August 1998, the government announced a comprehensive financial restructuring package focusing on four main aspects: (1) accelerated consolidation of banks and finance companies through additional interventions; (2) encouragement of private investment in the banking system; (3) provision of public funds to recapitalise viable financial institutions; and (4) development of a framework to create private asset management companies (AMCs). As a result, the authorities were required to intervene in seven banks and 69 finance companies.

Over the years, NPLs in the Thai financial system have been steadily declining. From a peak of THB 2,729.4 billion in June 1999, NPLs declined to THB 772.6 billion in December 2002, or approximately 15.77% of total loans outstanding. Despite the progress made, the remaining NPLs continue to pose a challenge to financial institutions' balance sheets, and have distracted them from focusing on new lending. In recent years, the performance of financial institutions has continued to improve, with operating profit increasing from THB 45.8 billion in 2001 to THB 77.5 billion in 2002 (Table 1).

Table 1
Performance of financial institutions¹

In billions of Thai baht
and per cent²

Items	1998	1999	2000	2001	2002
1. Interest income	730.20	374.99	334.93	307.98	279.26
2. Interest expense	663.39	312.87	226.86	182.74	149.03
3. Spread	66.81	62.12	108.06	125.25	130.23
4. Non-interest income	58.69	58.17	71.24	73.04	88.12
5. Operating expense	189.42	168.22	155.06	152.47	140.87
6. Operating profit (loss)	(63.92)	(47.94)	24.25	45.82	77.47
7. Provisions	370.90	366.38	130.38	53.07	50.16
8. Income tax	(0.70)	7.03	5.21	4.63	3.11
9. Extraordinary items ³	0.52	13.62	105.82	99.42	0.08
10. Net profit (loss)	433.60	407.74	(5.53)	87.54	24.28
11. Yield on loan	9.70	5.16	4.99	5.40	4.68
12. Yield on deposit	10.76	4.90	3.27	2.54	2.08
13. Spread	(1.06)	0.26	1.73	2.87	2.60
14. ROA	(5.74)	(6.00)	(0.08)	1.30	0.35

¹ Financial institutions include commercial banks, finance companies and credit foncier companies. ² Items 1 to 10 are in Thai baht; items 11 to 14 are in per cent. ³ Extraordinary items in 2001 are mostly reversed provisionings.

2.3 Phase III: new challenges

The past two years have seen a remarkable improvement in our domestic economic conditions. Growth has not only been stable, but has advanced at a relatively high rate, with GDP growth for the year 2003 expected to be in the range of 5.75-6.25% at the time of writing. Thai economic growth in 2004 is expected at 5.5-6.5%. The current accommodative monetary and fiscal policies are appropriate for our economic conditions at present. The inflation targeting and the managed floating exchange rate regime in this low interest rate environment are aimed towards supporting and boosting domestic demand, supplementing the strategy of export-led growth adopted earlier.

The present low interest rate, which has hit the bottom of the cycle, poses new challenges and risks, in particular as regards the timing of the tightening cycle. Currently the authorities, including the BOT, are closely monitoring the movement of equity and asset prices. In addition to the domestic front, external stability has also been one of our top priorities. This concern is reflected in the build-up of foreign exchange reserves, which has led to the prepayment of loans from the IMF official financing package in July 2003, as well as close monitoring of movement of the baht and of the balance of payments.

Another pressing issue is how central banks conduct policy in a world of volatile capital flows. More recently, it has been necessary for the BOT to find ways to manage the “return” of a large volume of capital inflows into Thailand, and to prevent them from disrupting economic growth. On 23 July 2003, the Bank announced the relaxation of exchange control regulations, aiming to promote Thai residents’ investment abroad and to offer alternative investment opportunities for residents. This was due mainly to temporary excessive savings, and these limits will be reviewed from time to time to suit the prevailing economic and financial situation. In addition, the BOT eased a number of other rules, including that on the holding of foreign currency deposits, allowing local state enterprises to hedge their foreign currency debts, as well as allowing Thai residents to issue structured products whose returns are linked to external variables, such as exchange rates and foreign assets. On a related issue, on 14 October 2003 the Bank announced additional measures to discourage speculation on the

Thai baht. This included restrictions on non-residents opening nostro accounts in baht with financial institutions in Thailand. While originally intended to facilitate the settlement of international trade and investment transactions, these accounts have also provided avenues for speculative activities. The authorities introduced restrictions on the use of these accounts (ie for settlement only) and a cap on outstanding amounts for accounts (not exceeding THB 300 million per non-resident), as well as ensuring that financial institutions refrain from paying interest on current and savings accounts of non-residents (except for fixed accounts with maturity of at least six months).

To discourage the practice of over-reliance of the Thai financial system on bank intermediation, the Thai authorities have taken steps to develop the domestic capital markets, an issue which ranks high on the economic agenda. A deep and liquid capital market will help facilitate and support the development of the Thai economy as well as sustaining its competitiveness in the global marketplace. Objectives in developing the capital market are to provide an effective source of financing, to create a favourable investment environment with a diverse investor base, to provide a world-class infrastructure with low transaction costs, and to encourage the establishment of strong and qualified institutional intermediaries. At the same time, the authorities aim to promote good corporate governance and any necessary measures that serve the appropriate needs of investors.

There is now regular issuance and trading of government securities, thus providing the market with an efficient and reliable benchmark yield curve. Daily turnover has risen considerably to around THB 11 billion per day at end-August 2003, up by almost 50% from 2002. This is a very significant turnover volume, given that the stock market has long dominated the Thai capital market. To this end, the authorities are working on promoting the essential infrastructure for bond market development, including the development of a private repurchase market and an electronic trading platform for bonds. To encourage investment and active participation by market players, the markets for hedging risk are also being developed, including the long-term interest swap market.

3. Globalisation continued

While the era of globalisation has been around for more than a decade, and has seen developments in information and communications technology unparalleled in modern economic history, for Thailand this is only the beginning. As a small and open economy, it is unavoidable that we will be affected by changes and shocks in the global arena. This was clear during the crisis; many of the triggers for policy changes were a result of global pressure and direction. In the past we have adopted defensive mechanisms to tackle these challenges and problems, but this strategy has proven costly and painful.

Looking forward, we recognise the need to be more active in coping with the shocks and pressures of the global economy. In order to be better prepared for such events, we have also recognised the need to build an early warning system that would alert us to external risks, uncertainties and possible turbulence. In this light, the members of ASEAN and EMEAP have attempted to develop self-help mechanisms as well as credible surveillance and peer review processes. At the regional level, Asian economies have worked together to develop deep and liquid regional bond markets which could provide a predictable source of funding for the government, state-owned enterprises and private firms. Bond markets also offer alternative investment opportunities for savers, and will increase the efficiency of the disintermediation process in Asia. Not only will efficient bond markets in Asia help mitigate the potential risk of double (currency and maturity) mismatches, they will also facilitate intraregional trade and investment and create a closer link among regional financial markets.

Despite the recent positive developments, it is important that the authorities not become complacent in the effort to continue raising standards and improving practices in our financial system. Further questions that arise include: what needs to be done so that we can be ready to meet future challenges? How can we better manage financial integration? Moreover, as a small open economy, to reap the full benefit of globalisation we need collective effort to create stable macroeconomic conditions, well developed financial systems, an effective early warning system and crisis resolution mechanisms. The 1997 crisis showed us that collective action is required to maintain growth and development in the world economy. The changes that Thailand has had to undergo - be they the change in the exchange rate regime, the search for the new anchor and framework for monetary policy, or the financial sector restructuring and massive capitalisation of banks - are but a single dimension, namely, the domestic front. The international front - where there arise the new demands and challenges of regional and global linkages - will open a new chapter for monetary cooperation.

High public debt, multiple equilibria and inflation targeting in Turkey

Fatih Özatay¹

I. Introduction

Even programmes that are based on sound macroeconomic fundamentals in economies with an inherited high public debt stock are prone to risks stemming from macroeconomic misbehaviour in the past. Shocks that increase concerns about the continuation of the current macroeconomic framework can push such economies to a bad equilibrium, in which there is high inflation, high real rates and sharp depreciation, from a good equilibrium with low inflation, low real rates and a stable currency. The possibility of multiple equilibria limits the efficiency of inflation targeting in such economies. In this note, we discuss these issues for the Turkish economy in the light of the recent experience under the IMF based programme, which has been implemented since May 2001.

II. High public debt and multiple equilibria in theory

Periods following recent currency crises have generally witnessed a sharp increase in public debt.² Models built on the Barro and Gordon (1983) framework show that if public debt is financed by government bonds, time inconsistency of optimal policy can generate multiple equilibria. In such models, a shift in market sentiment can push an economy to a bad equilibrium even if there is no deterioration in fundamentals. This occurs because the costs of honouring public debt or maintaining a fixed exchange rate regime depend on private agents' expectations about future policy. Calvo (1988) presents a model in which the possibility of debt repudiation is the root cause of multiple equilibria. Sachs et al (1996) show that certain levels of debt can give rise to multiple equilibria, while others do not. What is worrying from the perspective of central banks and governments in the emerging market economies is that anything, even sunspots, can be the reason behind a change in private agents' expectations.

III. Some stylised facts for the Turkish economy in the May 2001-November 2003 period

The evolution of macro fundamentals, interest rates and the exchange rate in Turkey in the post-crisis period raises interesting questions. In mid-May 2001, three months after the crisis broke out, Turkey started to implement a new stabilisation programme. The banking sector was collapsing, calling for immediate action by the government. The rescue programme increased the public debt-to-GDP ratio sharply. Other main pillars of the May 2001 programme were macroeconomic discipline and an ambitious agenda for structural reforms.

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² The jump in public debt mainly stems from the costs of resolving financial sector crises. For the most recent crises these costs are estimated at 34% of GDP for Korea, 20% for Mexico (Hoggarth and Saporta (2001, p 162)) and 33% of GNP for Turkey (World Bank (2003, p 21)).

The programme was supported by large IMF and World Bank credits. From late 2001, the programme started to show results. Inflation expectations began to follow a downward trend, the rate of inflation declined almost continuously and the public debt-to-GDP ratio was significantly reduced. The Turkish economy started to recover and the growth rate registered in 2002 was the second highest in major emerging market economies after China. Growth was sustained in 2003. The Treasury's borrowing rate declined to 28% in November 2003 from 194% in March 2001 and 95% in July 2001 (Table 1).

Table 1
Turkey: selected macroeconomic indicators

In percentages

	Growth rate¹	Expected inflation²	Expected inflation³	Wholesale inflation	Consumer inflation	Public debt stock/GDP	Interest rate⁴
2001.03	-1.0	55.0	na	35.1	37.5	72.1	193.7
2001.06	-9.8	63.3	na	61.8	56.1	98.2	88.4
2001.09	-7.5	69.8	64.8	74.7	61.8	105.1	87.6
2001.12	-10.3	72.7	69.8	88.6	68.5	99.7	74.1
2002.03	2.1	52.6	43.6	77.5	65.1	91.1	68.4
2002.06	8.9	45.4	35.2	46.8	42.6	95.0	72.2
2002.09	7.9	42.0	34.3	40.9	37.0	92.2	62.2
2002.12	11.4	35.0	31.0	30.8	29.7	87.4	49.8
2003.03	8.1	35.5	27.3	35.2	29.4	87.6	59.9
2003.06	3.9	29.3	25.4	29.6	29.8	81.7	46.0
2003.09	5.5	24.4	20.5	19.1	23.0	76.3	32.2

Sources: Central Bank of the Republic of Turkey; SIS; Treasury.

Note: ¹ Annual percentage change. ² Business survey of the central bank, expected year-end wholesale price inflation. ³ Expectations survey of the central bank, expected year-end consumer price inflation. ⁴ Average compound interest rates realised in Treasury auctions, weighted by net sales.

However, there were significant, though temporary, deviations from this positive trend. From May to October 2001, the interest rate followed an upward trend. This trend reversed from October 2001 to May 2002. At the beginning of May 2002, another reversal occurred. This deterioration stopped in the last quarter of 2002, but resumed again with the outbreak of the war in Iraq in May 2003. The time path for the exchange rate was similar (Figures 1 and 2). What was the main reason behind these temporary but sometimes relatively long deviations from the main trend?

The key to understanding these contrasting phenomena is the high domestic debt-to-GDP ratio and concerns over its sustainability. Although the stabilisation programme and the accompanying structural reforms imposed monetary and fiscal discipline, reducing the debt-to-GDP ratio to manageable levels required considerable time. In the meantime, a highly indebted economy is vulnerable to changes in market sentiment, in particular to concerns about debt sustainability. In other words, the high level of debt increases the possibility of multiple equilibria. Given macroeconomic fundamentals, the type of equilibrium the economy finds itself in or approaching mainly is determined by expectations. Negative expectations can lead the economy to a bad equilibrium, while positive expectations are likely to lead it to a good equilibrium.

Figure 1
Turkey: interest rates

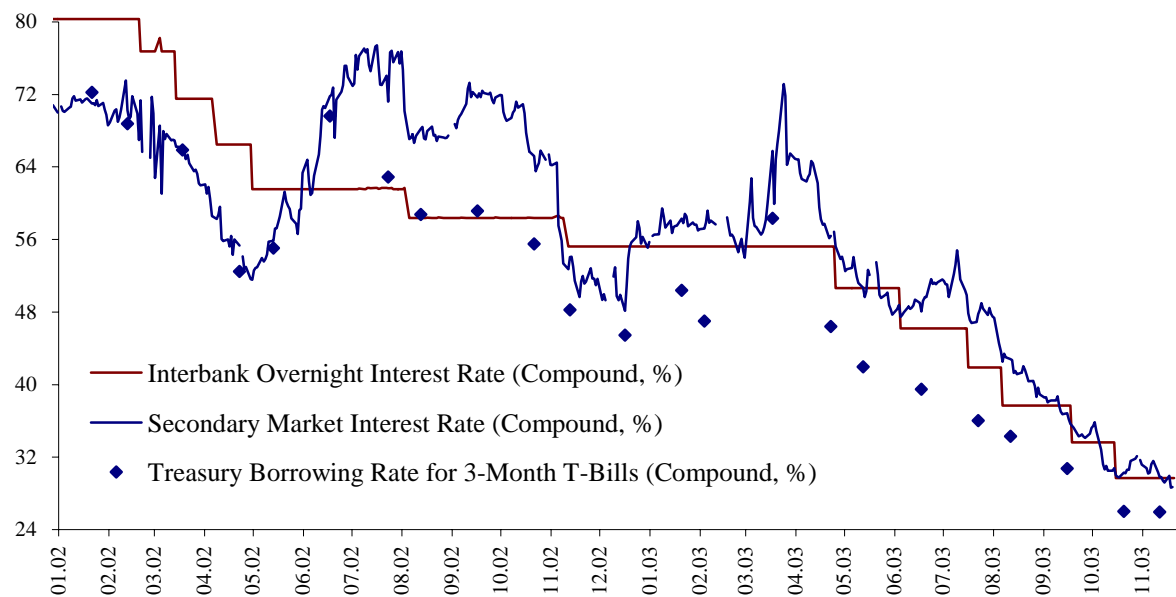
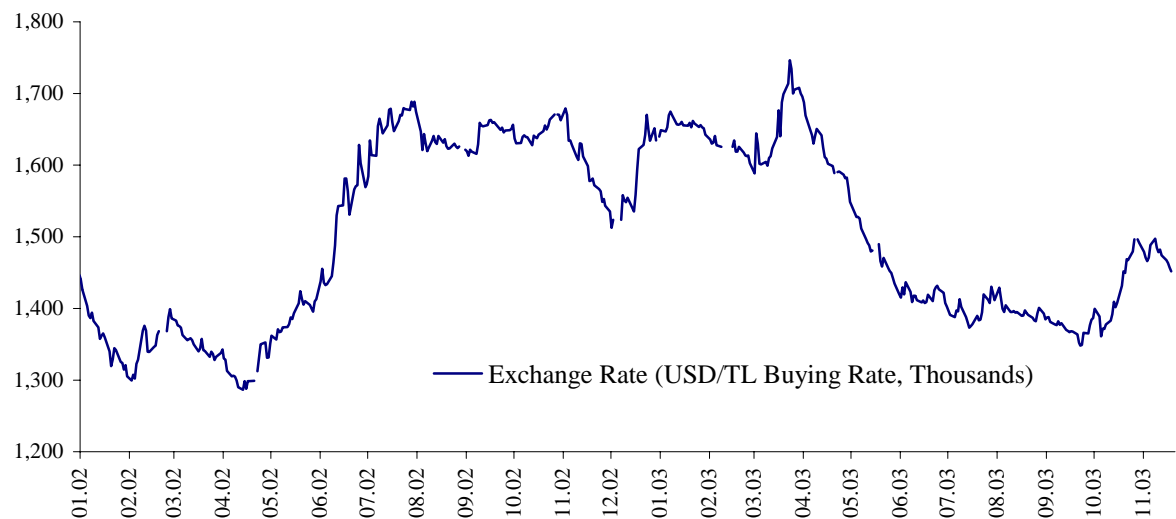


Figure 2
Turkey: exchange rate



But what causes the expectations to change? The keywords here are sustainability of public debt. The evolution of the debt-to-GDP ratio is a function of the real growth rate, the real interest rate and the ratio of the primary budget surplus to GDP. Policymakers cannot control the real growth rate and the real interest rate. Leaving monetary policy aside, a government can only control its budget and affect the real interest rate through the debt sustainability channel. A tight fiscal policy will increase confidence about sustainability of the debt and hence curb the country risk premium, provided that fiscal policy is regarded as credible by the private sector. What happens to the real growth rate is more complicated. However, there is an extensive body of literature on expansionary fiscal contractions in

highly indebted countries.³ That is, there is a high probability that fiscal discipline would reduce real interest rates and increase growth, which is obviously good news for debt sustainability.

Hence, any development that increases concerns about the viability of fiscal discipline has the potential to move the economy to a bad equilibrium. One candidate is domestic politics. Note that the IMF backed programmes have a “checklist”, ie a detailed timetable of policy actions not only with regard to fiscal and monetary policies, but also in reforming the economy. A public debate about this checklist among members of the cabinet may trigger a political shock and increase concerns about debt sustainability. External shocks such as 11 September or the war in Iraq can trigger similar effects. Another candidate is international developments that lead to reversals of capital flows to emerging market economies.

IV. Multiple equilibria and inflation targeting

An inflation targeting central bank should respond to an increase in the probability of an upsurge in future inflation by raising its policy rate. Now, suppose that in a highly indebted economy the pass-through effect is substantial, that is, the rate of depreciation of the domestic currency causes inflation to rise significantly. In such an economy, negative developments that raise concerns about debt sustainability would not only increase interest rates but also weaken the domestic currency. The reasoning is similar: investors in new government bonds would ask for higher rates to compensate for increases in default risk associated with rising inflation and the weakening currency. At the same time, the demand for assets denominated in foreign currencies would increase and reinforce the weakening of the domestic currency. Therefore, a central bank that raises its policy rate in response to a potential rise in inflation induced by the weakening of the currency faces two related problems. First, a rise in its overnight rate could signal to the markets that things are not going in the right direction. This could in turn increase the perceived default risk and, hence, the market rate while weakening the exchange rate. Second, an increase in the policy rate and the effect of the higher market rate and weaker exchange rate would increase the burden of public debt service and jeopardise debt sustainability. The domestic currency would depreciate in these circumstances, which is inflationary on the assumption that the pass-through effect is significant. In other words, increasing the short-term interest rate to cope with inflationary pressures would backfire.

A counterargument could be put forward here. A central bank that does its job by raising interest rates would be credible and such a credible policy decision would more than offset the negative effects on inflation described above. Analysing which argument is correct is beyond the scope of the present note. However, the fact that raising interest rates under such circumstances is likely to backfire cannot be rejected easily. Given this possibility, it follows that the effectiveness of inflation targeting in highly indebted economies is asymmetric: cutting the policy rate does not pose debt sustainability problems, whereas raising it does.⁴

The Central Bank of Turkey (CBT) has been implementing “implicit inflation targeting” under a floating exchange rate regime since the beginning of 2002. In other words, since January 2002 it has been changing its policy rate based solely on the inflation outlook. The CBT has also been explaining the rationale behind its decisions through public releases. Hence, the core of fully fledged inflation targeting has been in place. The timing of the rate changes and the meetings of the Monetary Policy Committee have not been known by the markets, and that is why we call it “implicit”. In the absence of domestic or foreign shocks and in view of strong macroeconomic fundamentals and a positive inflationary outlook, the CBT has cut its overnight rate 13 times since January 2002 (Figure 1). However, it has remained silent at times of shocks that had the potential to push the economy temporarily off course.

³ See for example Giavazzi and Pagano (1990), Perotti (1999) and Barry and Devereux (2003).

⁴ In a recent paper, Blanchard (2003) discusses similar problems for inflation targeting in Brazil and proposes a formal model that explains the positive correlation between interest rates and the rate of depreciation of the domestic currency.

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