

Foreign Exchange Reserves, Exchange Rate Regimes, and Monetary Policy: Issues in Asia

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This paper seeks to outline issues arising from rapid foreign exchange reserve accumulations in Asia. Attention is paid to People's Republic of China and India for the significance of the accumulation fed by surges in capital inflows. The paper finds that sterilization interventions by the two economies appear to be effective in curbing credit growth, but the impacts appear limited and short-lived. In this regard, adjustments of exchange rate policies are called for to have more freedom in policy options, though incentives to live with exchange rate fluctuations are still limited, and in fact the currencies have been managed more tightly than before. Therefore, the paper argues that, while maintaining the current exchange rate practices with capital controls in place, domestic reforms should be pushed further to be ready for capital account convertibility and more exchange rate flexibility in the long term.

I. INTRODUCTION

In Asia, many countries have gradually narrowed their exchange rate fluctuations by actively managing foreign exchange after the crises of 1997–1998.^{1,2} Authorities are accumulating dollar assets as a by-product of a strategy of export-led growth. The stock exceeded \$1,800 billion (or \$1,200 billion excluding Japan) at end-2003—half the global total reserves and more than 10 times the \$140 billion of its counterpart in Latin America. In 2003, Asian central banks used the reserves to finance well over half of the current account

¹Thirteen economies in the region are examined: PRC; Hong Kong, China; India; Indonesia; Japan; Korea; Malaysia; Pakistan; Philippines; Singapore; Taipei, China; Thailand; and Viet Nam.

²While some countries exited out of the fixed regime after the crisis, e.g., Thailand, the exchange rate variability has been reduced under the new regime.

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deficit and budget deficit of the United States (US).³ This would allow the US to continue borrowing without the usual warning sign of rising bond yields.⁴

McKinnon (2003) argues that American overspending has trapped East Asia into running current account surpluses: the region is forced to acquire dollar assets in order to avoid exchange rate appreciation and deflation. Conventionally it is understandable that governments like to have bigger reserves to defend their currencies against future attack. Asia is seen to forego better returns to keep its exchange rates down and export demand up. This regime allows the region's industries to compete on world markets and attract foreign investment (see Dooley et al. 2003).

However, the amount of reserves appears to be more than what would be warranted by conventional fundamentals (IMF 2003). The accumulation has been particularly significant in People's Republic of China (PRC); India; Japan; Republic of Korea (Korea); Pakistan; and Taipei, China where the growth rate of reserves has exceeded 20 percent during the last 2 years. Worth noting are the PRC and India, which recorded average growth rates of above 30 percent in 2001–2003 (Table 1).⁵ The PRC's reserve accumulation reached above \$400 billion accounting for 22 percent of the total Asian reserve after Japan (35 percent) in 2003. Bird and Rajan (2003) estimate an opportunity cost of holding foreign exchange reserves of around 0.3–1 percent of gross domestic product (GDP) for six Asian countries (PRC, Indonesia, Korea, Malaysia, Philippines, and Thailand).⁶

³Net purchase of US marketable Treasury and federal financing bonds by the PRC and Japan for 2003 was \$698 billion while US currency account and budget deficit summed to \$917 billion.

⁴*The Economist* (2004) reports "at their recent pace of intervention, Japan and PRC could buy enough Treasury bonds this year to more than cover the US government's new borrowing needs (in 2004)."

⁵Pakistan's reserve has also grown, but the level is still rather low, just above \$10 billion.

⁶The cost is defined as a difference between US Treasury Bond rate and the domestic marginal productivity of investment.

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Table 1. **Reserve Accumulation (Billions of US\$)**

	Foreign Exchange Reserves, End-2003	Share of Total Asian Reserves (percent)	Growth Rate during 2001–2003 (percent)
Japan	653	35	26
PRC	408	22	32
Taipei, China	207	11	26
Korea	152	8	19
Hong Kong, China	118	6	3
India	107	6	36
Singapore	95	5	12
Thailand	41	2	12
Malaysia	38	2	12
Indonesia	33	2	9
Philippines	13	1	-2
Pakistan	13	1	49
Viet Nam	4	0	9
Total excluding Hong Kong, China; Japan; and Singapore	1,016	54	25
Total	1,883	100	23

Source: Institute of International Finance and *International Financial Statistics* (IMF various years).

Against this background, several questions arise:

- (i) What are the reasons and sources for the reserve accumulation?
- (ii) What are the exchange rate policies and practices that have led to the accumulation?
- (iii) What has been the liquidity management policy in capital importers in Asia?
- (iv) What are the policy considerations for the current policy mix and are they sustainable in the medium to long term?
- (v) Are there any incentives to move out of the current monetary practices?

While other questions such as “what are the costs and benefits of accumulating large reserves?” definitely warrant an in-depth study, this paper focuses on issues that are directly linked to sustainability of the exchange rate regimes in Asia, namely international liquidity positions, exchange rate policies, and monetary policies. The aim is to pave the way for a better understanding of the issue. Thirteen Asian countries are examined: PRC; Hong Kong, China; India; Indonesia; Japan; Korea; Malaysia; Pakistan; Philippines; Singapore; Taipei, China; Thailand; and Viet Nam. The outline of the paper is as follows. Section II summarizes why the three issues—international liquidity position, exchange rate policies, and monetary policies—need examining. Section III decomposes reserve accumulation and examines characteristics of capital flows. Section IV assesses the exchange rate regimes and monetary policy framework.

Section V follows with discussions on sterilization interventions in the PRC and India. Section VI assesses factors affecting the exchange rate regime. The final Section VII draws policy implications on the issue.

II. SUSTAINABILITY OF THE INTERMEDIATE REGIME

The macroeconomic policy trilemma for open economies (also known as the “inconsistent trinity” proposition) follows from a basic fact: An open capital market deprives a country’s government of the ability to simultaneously target its exchange rate and to use monetary policy in pursuit of other economic objectives.⁷ Since major international capital market-related crises since 1994—Mexico (1994); Indonesia, Korea, Thailand (1997); Russia and Brazil (1998); and Argentina and Turkey (2000)—have in some way involved a fixed or pegged exchange rate regime, policymakers involved in dealing with these crises have warned strongly against the use of pegged rates for countries open to international capital flows. That warning has tended to recognize that an intermediate policy regime between hard pegs and floating is not sustainable. This is the bipolar view or two-corner solution view (either one of the three sides in Figure 1). However, Fischer (2001) and others argue that the bipolar view may exaggerate the point for dramatic effect, and suggest a possible intermediate regime:

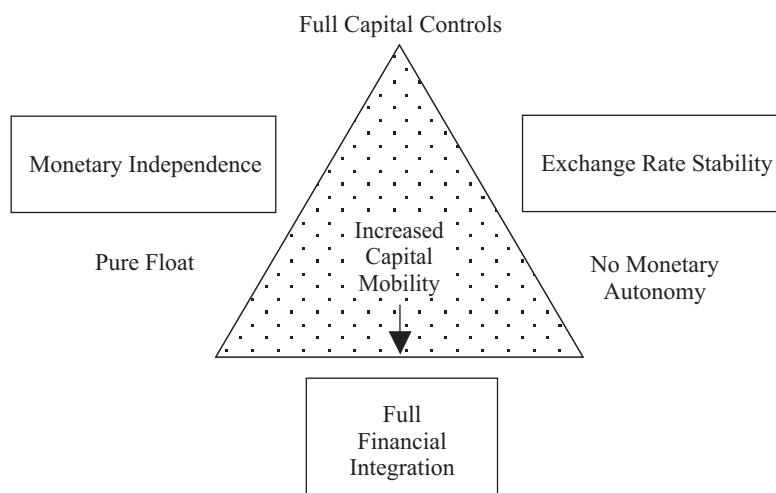
for countries open to international capital flows: (i) pegs are not sustainable unless they are very hard indeed; but (ii) that a wide variety of flexible rate arrangements are possible; and (iii) that it is to be expected that policy in most countries will not be indifferent to exchange rate movements.

In fact, many Asian countries fit in this gray area—intermediate regime of “a managed exchange rate with a different degrees of capital controls”—an interior solution in Figure 1. The attraction of intermediate regimes without capital controls is that they offer to combine the advantages of exchange rate stability, exchange rate targeting, and exchange rate variation. The outstanding

⁷The trilemma arises because a macroeconomic policy regime can include at most two elements of the “inconsistent trinity” of three policy goals: full freedom of cross-border capital movements, a fixed exchange rate, and independent monetary policy oriented toward domestic objectives. If capital movements are prohibited, or where element 1 is ruled out, a country on a fixed exchange rate can break ranks with foreign interest rates and thereby run an independent monetary policy. Similarly, a floating exchange rate or where element 2 is ruled out reconciles freedom of international capital movements with monetary policy effectiveness. But monetary policy is powerless to achieve domestic goals when the exchange rate is fixed and capital movement is free, or the case where element 3 is ruled out, since intervention in support of the exchange parity then entails capital flows that exactly offset any monetary policy action, threatening to alter domestic interest rates.

problem is that they are vulnerable to speculative attack as was proved in the crises of the 1990s—due primarily to the logic of the impossible trinity. On the other hand, regimes with capital controls, which many Asian economies adopt, permit authorities to deploy monetary policy and exchange rate policy as separate instruments.

Figure 1. **Macroeconomic Policy Trilemma**



A natural question that arises then is whether the intermediate regime is a sustainable one. Frankel (1999) argues that the optimal exchange rate regime depends on the circumstances of a particular country and time. The intermediate solutions are more likely to be appropriate for countries where large-scale capital flows are not an issue.⁸ Meanwhile, Goldstein (2002) advocates a “managed floating plus” regime. The “plus”, which would tackle the problems of the intermediate regimes, includes inflation targeting and aggressive measures against currency mismatching. Inflation targeting that serves as a nominal anchor, which replaces the fixed exchange rate and reduces currency mismatches, can be obtained by allowing the exchange rate to move enough to remind market participants of currency risk, among others. Goldstein says that if managed floating were enhanced in this way, it would retain the desirable features of a managed floating rate regime, namely, greater monetary policy independence and resilience to large external shocks.

⁸Frankel (1999) says that floating will continue to be desirable for large economies. Fixed may be desirable for very small open economies or those with a history of hyperinflation or dominance of demanding investors, which have reduced confidence and rendered independent monetary policy unusable.

The key to maintain the intermediate regime, therefore, boils down to how to handle inflationary pressure without a nominal anchor, and also to have a situation where revaluation is a feasible solution if necessary—the two immediate issues that some Asian economies are facing. The issue of sustainability of the intermediate regime appears as an issue to settle. Goldstein argues that good monetary policy discipline is essential to improve the performance of managed floating. In maintaining the intermediate regime, some countries intervene directly from time to time in the foreign exchange markets to try to stabilize the exchange rate. Fischer argues that so long as they are not perceived as trying to defend a particular rate, such interventions can be useful. Nonetheless, there is controversy over whether intervention works at all—and even if it does, whether it is wise to use it.

As inflationary pressures emerge due to price hikes in raw materials and oil, and surges in capital inflows, the sustainability of the currency exchange rate policies and practices once again needs extra attention in Asia. Against this background, the remaining sections examine the source of reserve growth, focusing on capital flow movements, exchange rate managements, and monetary policy discipline; including sterilization interventions exercised in selected countries in order to assess the current policies and their sustainability.

III. SOURCES OF RESERVES: CURRENT ACCOUNT AND CAPITAL FLOWS

The main reason why countries hold foreign exchange reserve is to smooth unpredictable and temporary imbalances in international payments. Thus the basic idea in the theory of the demand for reserves is that a country chooses a level of reserves to balance the macroeconomic adjustment costs incurred if reserves are exhausted (the precautionary motive) with the opportunity cost of holding reserves (IMF 2003).

As IMF (2003) finds, the level of reserve accumulations in some of the Asian economies has become much higher than warranted by conventional determinants, such as economic size, level of imports, export volatility, and exchange rate flexibility.⁹ Decomposing the change in reserves¹⁰—reveals that 13 sample economies can be grouped into roughly three subgroups that are

⁹The same study, however, does not find the opportunity cost of holding reserves to be a significant determinant of reserve accumulations due perhaps to measurement problems. While cost and benefit of holding reserves definitely deserve a further in-depth study, this section focuses on sources of reserve accumulations, which is a key factor in assessing the intermediate regime's sustainability.

¹⁰Current account consists of trade balance, services balance, income, and current transfers. Capital flows components are net errors and omissions; capital account (capital transfers associated with migrants, debt forgiveness, or other government transfers); and financial account (FDI + portfolio investment + other including cross-border bank credits).

experiencing: (i) current account surplus and net capital inflows, (ii) current account surplus and net capital outflows, and (iii) relatively small balance of payments activity (Table 2). All sample economies with the exception of Pakistan and Viet Nam reported current account surplus as of end-2003. One notable observation, however, is a difference in the trade balance. In countries where the service sector is strong (e.g., Hong Kong, China; India; Pakistan; Philippines), the current account surplus is supported by the service trade surplus, or more precisely, remittances from residents abroad, e.g., Philippines. While the current account side appears rather uniform—“surplus”—directions of capital flows vary across economies.

**Table 2. Grouping by Current Account and Capital Account Positions
(As of end-2003)**

Group A (5 Economies) Current Account-surplus and Capital Inflows	Group B (5 Economies) Current Account-surplus and Capital Outflows	Group C (3 Economies) All Accounts Less than \$5 billion
PRC	Hong Kong, China	Pakistan
India	Indonesia	Philippines
Japan	Malaysia	Viet Nam
Korea	Singapore	
Taipei,China	Thailand	

After a period of postcrisis drying up of capital inflows, capital flows turned around to trend upward during the past few years driven by both “push”—the recovery of the world economy and low rate of returns outside, and “pull”—rapid economic growth of some countries. Inflows during the last few years, however, were concentrated in limited countries: PRC; India; Japan; Korea; and Taipei,China (Group A), which attracted more capital than they export. The PRC is the leading capital importer (except for Japan), receiving \$60 billion in 2003, largely as a pipeline of commitments for new foreign investment; followed by \$17 billion to Korea and \$11 billion to India. Alternatively, in Hong Kong, China where the dollar interest rates remain below the US dollar rate, residents’ investment in foreign equities offset nonresidents’ investment in domestic equities. Part of the portfolio outflows are related to purchase shares in the PRC’s companies traded on the Hong Kong, China stock exchange, which are treated as foreign equities for the purpose of balance of payments statistics.

Two major components of the capital (or more precisely, financial) flows are equity investments and commercial bank flows. Table 3 shows a clear trend in the equity investment—sum of direct and portfolio investments—that has been directed to the PRC and India in recent years. The PRC, in particular, has become by far the most attractive destination of equity investment, receiving about \$190 billion during the past 4 years or about 4 percent of GDP on average. On the other hand, portfolio investments to countries like Korea have recently

significantly decreased from about \$59 billion in the early 1990s to \$14 billion accounting for a share of only 5 percent of the total flow to the sample countries. Despite the striking increase of FDI flows to Korea and Thailand, the greater effect on flows in the foreign exchange market have come from a sharp rise in net portfolio capital inflows especially into PRC, India, and Japan, as well as Korea and Taipei, China. Portfolio capital inflows have been lured by and fueled equity market rallies in the region (Appendix Table A1), but they also reflected expectations of exchange rate appreciation in selected economies. In India, portfolio flows (1.7 percent of GDP) have become more prominent exceeding the direct investment (0.8 percent of GDP) in 2003. The same trend can be found for the PRC though direct investment (3.5 percent of GDP) is still the major part of the equity investment.

Table 3. Net FDI and Portfolio Investments
(Millions of US\$)

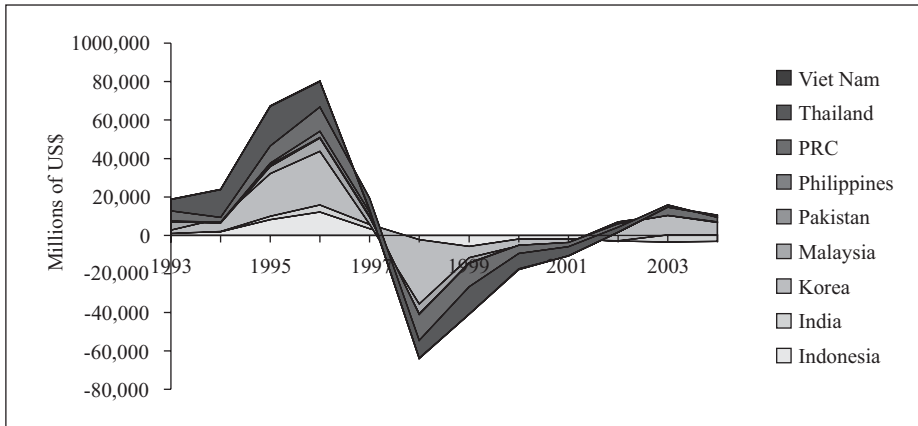
	Cumulative Flows (1993–1996)	Share of Total Flows (percent)	Cumulative Flows (2000–2003)	Share of Total Flows (percent)
PRC	132,753	47	187,600	71
India	19,707	7	30,779	12
Korea	58,745	21	13,546	5
Indonesia	14,636	5	10,715	4
Thailand	10,186	4	10,473	4
Malaysia	29,243	10	4,358	2
Philippines	8,204	3	3,757	1
Viet Nam	3,226	1	2,260	1
Pakistan	4,473	2	2,042	1
Total	281,173	100	265,530	100

Note: Three financial centers (Hong Kong, China; Japan; and Singapore) are excluded.

Source: Institute of International Finance.

The trend of commercial bank flows is distinct from that of equity investment. The dramatic change is found around the time of the Asian financial crisis in 1997 and 1998 (Figure 2). As well documented, the contagious withdrawal of capital from the region—sudden stop of capital inflows—forced the crisis-hit countries to suffer from liquidity crunches. The major component of the capital inflows that eventually reversed was bank lending, notably from Japan. Figure 2 shows that the net total commercial bank flows have shrunk significantly to \$14 billion in 2003 compared to over \$80 billion at its peak in 1996. Three crisis-hit countries, Indonesia, Philippines, and Thailand, still experienced net outflows in 2003. There are only three countries that attracted sizeable bank inflows: PRC, India, and Korea. They attracted about \$4 billion (India), \$5 billion (PRC), and \$10 billion (Korea) in 2003 while Malaysia and Viet Nam received less than a billion.

Figure 2. Net Commercial Banks Flows (millions of US\$)



Source: The Institute of International Finance

The decomposition above indicates that even within Group A, volatility of the capital account may vary due to the different types of flows they are experiencing. Past studies show that FDI tends to be least volatile, while portfolio and bank flows flee easily. In this regard, countries like India, where portfolio and bank flows are more significant than FDI, appear most fragile to capital account development, while it is less so in the PRC. Nonetheless, the volatility and actual magnitude of outflows are significantly affected by the extent of capital controls that each country adopts. Since it is a crucial part of the intermediate regime, it will be examined later in the paper.

IV. EXCHANGE RATE MANAGEMENT

Monetary authorities in Asia appear committed to strict management of the exchange rate in both variability and level. This is not only to support export-led growth by maintaining currency competitiveness, but also to address a situation where inability to raise funds in domestic currency creates a currency mismatch problem, which makes domestic banks and firms more vulnerable to currency fluctuations. In addition, the US dollar has been serving as the currency for trade transaction, and it is not surprising to observe that small, open economies like many developing countries want to have a stable domestic currency vis-à-vis the US dollar. Consequently, intervention in foreign exchange markets became a common practice.

A. Exchange Rate Variability

The norm of exchange rate management is that “the currency is determined by the market. However, when the market is disrupted by seasonal or irregular factors, the central bank shall step in” (The Central Bank of China, Taipei, China; see Appendix Table A2 for other countries).

Abrupt changes in exchange rates disturb domestic economies, but the question is, “To which degree must the exchange rate be left to be determined in the market?” PRC; Hong Kong, China; and Malaysia have either currency board arrangement (CBA) or official fixed peg arrangements, and are in fact strict fixers. While other countries such as Korea and Philippines declare float regimes, the common ground appears to be that all central banks intervene in foreign exchange markets to a certain degree.

Table 4 presents the average variance of monthly nominal and real exchange rate changes. The three fixers vary monthly at less than 1 percent—both nominal and real—with occasional revaluations, i.e., 1994 in the PRC and 1998 in Malaysia. Among the countries that claim to be independent floaters (Japan, Korea, and Philippines), the Philippines’s peso fluctuates the least. The variance of the Philippine peso appears very close to how the managed currency fluctuates. Korea and Japan are most volatile among the sample countries exceeding 2 percent of monthly variability; they however, are still substantially lower, for example, than the US dollar or euro of about 3 percent over the corresponding period. Consistent with perceptions (but contrary to what the regime dictates), the official floaters’ variances suggest managed regimes. The real exchange variance ranges from 0.8 to 3.5 among the de jure managed regime countries with Indonesia having the largest average variance during 2001 and 2004Q1. The Indonesian rupiah was tightly controlled until speculative pressure devalued it in January 1998. Since then, the Indonesian currency has been the most volatile in the region, even including the floaters. Although exchange rate regimes, perhaps except for India, are found to have moved to more flexibility until 2001, recent data suggest a reversal of this trend. Except for Korea, most of the economies, even Indonesia, reduced the variance to around 1 percent by 2003. The trend appears to have continued to 2004. Therefore, these countries are apparently shifting toward more managed regimes.¹¹

¹¹ Admittedly, measuring foreign exchange intervention and sterilization success is difficult. Monetary authorities claim that they intervene only when exchange rate levels deviate from true underlying “fundamentals.” Thus, it is difficult to distinguish whether the currency movements reflect interventions or changes in fundamentals that led to them. Further, it is complex to assess the timing of the market’s response to an intervention. If the foreign exchange intervention were anticipated, then speculators would be likely to respond to its anticipated impact before it actually occurred. Alternatively, if the market were initially

**Table 4. Average Monthly Exchange Rate Variability, 2001–2004
(In relation to US\$)**

	Nominal Exchange Rate (percent)	Real Exchange Rate (percent)	Official Regime
Hong Kong, China	0.06	0.58	Currency Board Arrangement
PRC	0.00	0.75	Fixed
Malaysia	0.11	0.34	Fixed
Japan	1.86	2.96	Float
Korea	1.80	2.09	Float
Philippines	1.31	1.24	Float
Taipei,China	0.71	1.34	Managed
India	0.38	1.27	Managed
Indonesia	3.24	3.59	Managed
Pakistan	0.65	1.07	Managed
Singapore	1.01	1.29	Managed
Thailand	1.09	1.30	Managed
Viet Nam	0.16	0.81	Managed
Average		0.95	1.43

Note: Average variance of monthly exchange rate changes.

Sources: *International Financial Statistics* (IMF various years), DataStream, and author's calculations.

B. Exchange Rate Levels

Although monetary authorities are explicit about reducing exchange rate volatility, the targeted levels are hardly explicit; some are more market-determined than others. Contrary to reducing variance of exchange rates across countries, exchange rate levels appear to be taking varying paths. Noticeable evolutions, however, are that all currencies—except for the Indonesian rupiah, which has been steadily appreciating in real terms since 2002 due to high inflation—were depreciating in real terms from 2000 to 2001, and to 2002 in some countries (Table 5). This trend was largely supported both by nominal depreciation and deflationary pressures in PRC; Hong Kong, China; Japan; Singapore; and Taipei,China (Table 6). Although inflationary pressure has hardly been an issue in the region, the strong economic growth/recovery, recent commodity/oil price increase, and surge in capital inflows started to put inflationary pressures in 2003 and continues in 2004. Domestic demand is also picking up such as in Thailand. As combined with the weak US dollar, currency appreciation kicked in 2003, and has become more obvious in 2004.

uncertain about the magnitude of an intervention, its response might be delayed until the true magnitude is revealed.

**Table 5. Real Exchange Rate
(2000=100, CPI Base)**

	PRC	Japan	India	Korea	Taipei,China	Malaysia	Thailand	Indonesia	Pakistan	Philippines	Viet Nam	Singapore	Hong Kong, China
2000	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2001	102.5	116.7	103.9	112.1	111.3	101.4	111.1	111.2	115.0	110.7	107.9	105.7	104.6
2002	105.6	122.1	104.1	106.6	115.9	101.2	108.5	91.0	108.7	110.4	108.9	107.2	109.6
2003	106.0	116.2	98.2	101.1	118.3	102.4	105.1	80.8	104.6	115.3	109.6	106.6	114.8
2004	105.6	108.6	93.7	97.8	115.7	103.0	99.5	78.1	101.8	118.1	108.3	103.5	116.7

Note: Real effective exchange rate for PRC, Japan, Korea, Malaysia, Pakistan, and Philippines.

The rate is against the US dollar otherwise.

Increasing number is depreciation.

Sources: *International Financial Statistics* (IMF various years) and Central Bank of China.

**Table 6. CPI Inflation in Asia
(Percent)**

	PRC	Japan	India	Korea	Taipei,China	Malaysia	Thailand	Indonesia	Pakistan	Philippines	Viet Nam	Singapore	Hong Kong, China
2000	2	-1	4	2	1	2	2	4	4	4	-2	1	-4
2001	0	-1	4	4	0	1	2	11	3	6	0	1	-2
2002	-1	-1	4	3	0	2	1	12	3	3	4	0	-3
2003	2	0	4	4	0	1	2	7	3	3	3	1	-3
2004	2	0	4	3	1	1	2	5	5	3	4	1	-2

Note: Average annual rate; average of the first quarter for 2004.

Sources: *International Financial Statistics* (IMF various years) and Central Bank of China.

In the case of nonfixers, as Goldstein advocates, having a strict monetary discipline serving as a nominal anchor is crucial in maintaining the managed exchange rate regime to put money supply under control. One solution would be inflation targeting,¹² which Korea, Philippines, and Thailand in the sample currently adopt. Aside from these three strict fixers, two economies target monetary aggregate (Indonesia and Taipei,China); as do five other economies whose monetary policy framework is not very explicit, namely, India, Japan, Singapore, Pakistan, and Viet Nam.

When liquidity management is not a major concern in tranquil times, the difference in the monetary policy framework can be minimal. However, the recent capital inflow to countries like the PRC and India raises a question on feasibility of the current monetary and exchange rate policies and practices, particularly because the pegged exchange rate level may be a severely undervalued one (the PRC) and/or monetary discipline is not very explicit (India) (Table 7).

Table 7. **Monetary Policy Framework**

Hong Kong, China	Exchange rate anchor
Malaysia	Exchange rate anchor
PRC	Exchange rate anchor / Monetary aggregate target
Korea	Inflation targeting
Thailand	Inflation targeting
Philippines	Inflation targeting
Indonesia	Monetary aggregate target
Taipei,China	Monetary aggregate target (M2)
Viet Nam	IMF-supported or other monetary program
Japan	Other ^a
India	Other ^a
Pakistan	Other ^a
Singapore	Other ^a

^a No explicitly stated nominal anchor; monitors various indicators in conducting monetary policy.

Sources: Classification of Exchange Rate Regimes and Monetary Frameworks 2003 (*International Financial Statistics* various issues), central bank web sites.

The capital inflows represent an increase in the demand for a country's assets—hence, in the absence of policy intervention, the currency tends to appreciate on foreign exchange markets. Past observations tell us that most of the developing countries that receive sizable capital inflows normally resist nominal exchange rate appreciation, albeit to a varying degree. When surges in capital inflows and/or purchases of foreign exchange bring inflationary pressures—

¹²Although inflation targeting does not solve all the problems of not having a nominal anchor, and challenges of implementation are greater for emerging economies than for industrial ones, experience so far suggests that inflation targeting represents a promising monetary policy framework and a better nominal anchor than the leading alternatives.

growth in reserve money—monetary authorities do step in to sterilize excess liquidity. The intent is to mitigate inflationary pressures, real exchange rate appreciation, and avoid the loss of control over the domestic money stock. The next section discusses sterilization practices in the countries that have been experiencing particularly rapid growth in reserve money—the PRC and India.

V. STERILIZATION INTERVENTIONS IN THE PRC AND INDIA

The PRC and India have been experiencing rapid increase in foreign reserves exceeding 30 percent in the past 2 years—and the liquidity management appears pressing in their policy agenda. As an indication of inflationary pressure, they experienced real appreciation of their currencies (against the US dollar) from 2003 to 2004.¹³ This recent appreciation marks a pause in a much longer depreciation trend, which started as early as 1994 in the PRC and 1998 in India. Further, considerable foreign exchange reserves accumulation suggests that the central banks have intervened to avoid or mitigate an exchange rate appreciation. Several distinct episodes of intensive sterilization offer an opportunity to gauge the macroeconomic effects of these policies: the main episodes examined in this section include the PRC from 2002 to present, and India from 2001 to present.

A. People's Republic of China (2002–2004)

With strong intention to maintain the stability of the renminbi (Rmb), interest rate, and exchange rate, the People's Bank of China (PBC) uses both direct (purchases and sales in intervention currency, i.e., US dollars) and indirect intervention (use of quantitative restrictions, reserve requirements, and interest rate flexibility) to manage the exchange rate.

1. Sterilization Intervention

The rapid growth of export earnings and foreign direct investments (FDI) in 2002 resulted in foreign exchange asset build-up in the PRC. Consequently, the PBC purchased huge amounts of foreign exchange in the market, leading to an increase in base money. Against this background, the PBC started to change its operation direction from buying to selling bonds on 9 April 2002, while maintaining the means of increasing base money supply through short-term reverse repo.

On 25 June 2002, the PBC began to withdraw large amounts of base money through long-term repo. However, the PBC repo operation was restricted

¹³The trend—appreciating from 2003 to 2004—can be also found with real effective exchange rates albeit the change is relatively slower.

by lack of bonds to facilitate in the PBC, which led to a conversion of the premature repos into central bank papers on 24 September. To strengthen open market operation (OMO) capacity, monetary authorities increased the frequency and number of primary dealers, strengthened the monitoring and analysis of the liquidity position of the primary dealers, and eliminated the approval requirement to issue treasury bonds and policy financial bonds in the interbank bond market during the first half of 2003. Nonetheless, limited securities held by the PBC seriously restrict effectiveness of the PRC's OMO as the PBC is not vested with the power to issue securities. In an attempt to control the growth of base money resulting from the increase in foreign reserves, the PBC issued central bank bills in 2003 (about \$88 billion) to mop up excess liquidity and sterilize the capital inflows. Further, beginning 2003, the PBC has also used reserve requirements—raising the deposits reserve ratio from 6 to 7 percent in September 2003 and again to 7.5 percent in April 2004. Meanwhile, it appears that window guidance and quantity control have increased their importance to complement other tools. Table 8 summarizes the chronology of the sterilization efforts.

Table 8. PRC Sterilization Efforts

Date	Instrument	
25 June–10 December 2002	OMO	The PBC carried out a total of 24 repurchase operations and released a total of RMB246.75 billion yuan.
22 April–December 2003	OMO	Between April and December 2003, the PBC offered Rmb 722.68 billion in 63 issues of central bank bills, with the balance reaching RMB337.68 billion yuan. In 2003, the PBC carried out 59 OMO in securities transaction, withdrawing RMB269.4 billion yuan and releasing RMB1.0492 trillion, a net withdrawal of RMB269.4 billion yuan.
16 July 2003	WG	The PBC summoned the financial institutions to a window guidance meeting and required them to properly control aggregate credit.
11 August	WG	The PBC summoned the financial institutions to a window guidance meeting and required and 12 September 2003 them to take measures to prevent credit and liquidity risks.
21 September 2003	RR	The deposits reserve ratio was raised from 6 to 7 percent, freezing excess reserves of commercial banks.
10 December 2003	Other	PBC widens the floating band of the lending rate of financial institutions to 90–170 percent for commercial banks and urban credit cooperatives, and 90–200 percent for rural credit cooperatives.
25 April 2004	RR	The required reserve ratio was raised to 7.5 from 7 percent. Based on the arrangement of differentiated required reserve ratio, financial institutions with capital adequacy ratio below a specific level must comply with an 8 percent ratio.
Q1 2004	WG	Required financial institutions to halt loans on infrastructure investments not approved by the government, including government buildings, motorway construction, and golf courses.
June 2004	Capital Control	Limit foreign borrowing.

Note: RR means reserve requirement, OMO means open market operation, WG means window guidance.

Source: The People's Bank of China website.

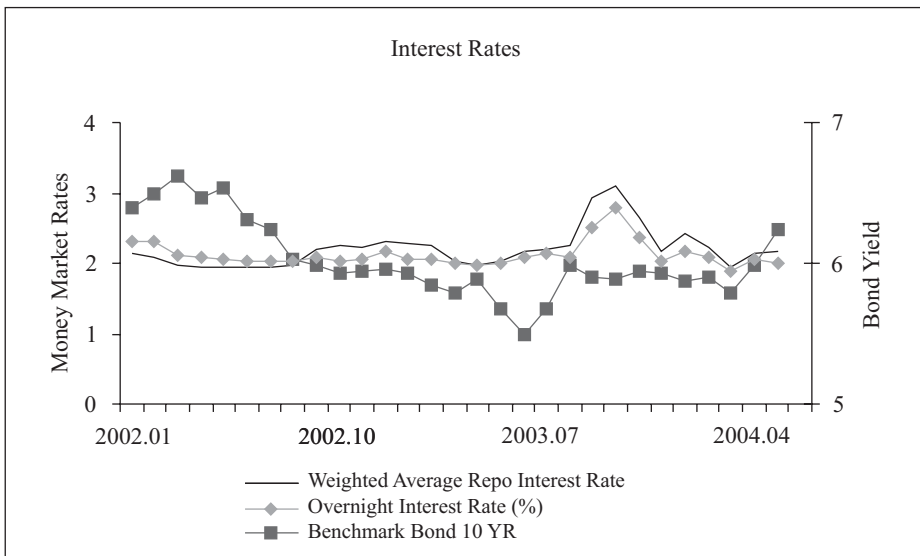
2. Impacts of Sterilization

Credit growth in the PRC accelerated after the interest rate cut in March 2002 and averaged 18 percent for 2002–2003. Since the financial institutions' loan and deposit rates are not decided by market forces, the PBC focuses its operational target on base money, and takes the interest rates of the money and bond markets as the monitoring indexes for base money adjustment.

Since 2001, funds supply has exceeded demand and the money market rates have been declining. The bond yield started to rise during the second half of

2003 as the bond issuance increased to RMB337.68 billion. For the repo rate, the operations that started in June 2002 had only a minor impact on the rate—a rise by 40 basis points in September/October 2002. However, both overnight and repo rates rose sharply by 80 basis points in September and October 2003 following an increase in reserve requirements as well as window guidance that took place in September. Although the impact was temporary there were some real effects (Figure 3).

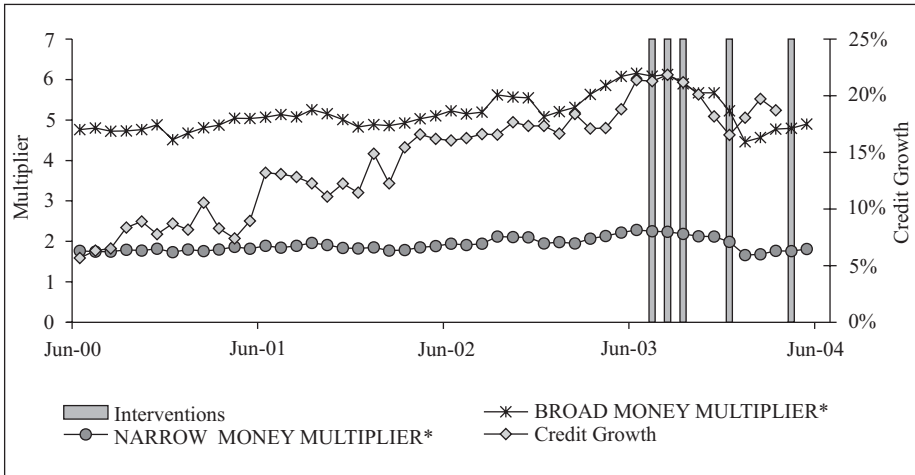
Figure 3. PRC Interest Rates



Source: People's Bank of China.

The macroeconomic effects of the reserve policy would depend importantly on who pays the reserve tax—either an increase in the deposit rate or lending rate. However, these interest rates would not reflect the reserve requirement changes since the PRC regulates bank interest rate movements. Therefore other monetary indicators such as money multipliers and credit growth are examined. The growing concern over the overheating investment led the PBC to finally take discrete measures (in addition to the OMO) in July 2003 when the annual credit growth rate exceeded 20 percent and broad money multiplier reached over 6 (Figure 4).

Figure 4. Credit Growth and Money Multipliers



Sources: PBC, IFS, author's calculation.

As can be seen from Table 9, the money multipliers have responded quickly and dropped as the interventions took place for 3 months from July to September 2003: the broad (narrow) money multiplier dropped from 6.16 (2.28) to 5.67 (2.12). On the other hand, credit growth did not show a sizable change, but at least it did not accelerate. Not all the decline in both narrow and broad money multipliers need to be exclusively attributed to increases in reserve requirements. However, the policy appears effective at least in the short run in curbing money expansion. On the other hand, the measure to widen the floating band of lending rates in December 2003 did not have immediate responses: the lending and deposit rates were unchanged.

Subsequently the credit growth and money multipliers turned around and started to rise once again during the first quarter of 2004. The PBC responded by raising the reserve requirement rate and implementing window guidance measures in the first quarter of 2004. The one-year relending rate was also raised from 3.24 to 3.87 percent while keeping the deposit rate fixed. Despite the acknowledgement and commitment not to allow the economy to overheat, the PRC government authorities are concerned with the slowing of economic activity in less developed rural areas and the agricultural sector, where more investments are needed.¹⁴ Therefore, measures like window guidance that can focus its effect on specific sectors and areas (urban) rather than raising discount rates have been

¹⁴Economic growth during the first half of 2004 is 15.4 percent in Beijing, while the national average is less than 10 percent.

used during the first half of 2004.¹⁵ Nonetheless, the fixed exchange rate regime continues to demand printing yuan in exchange for capital inflows, thus increasing the money supply and hampering efforts to ease the growth in lending.

Table 9. PRC: Impacts on Interest Rates and Money Multipliers

Date of Interventions	Annual Credit Growth (percent)	Time Deposit (1 year, percent)	Relending Rate (1 year, percent)	Broad Money Multiplier	Narrow Money Multiplier	
June 2003	21	1.98	3.24	6.16	2.28	
July 2003	WG	21	1.98	3.24	6.09	2.25
August 2003	WG	22	1.98	3.24	6.12	2.24
September 2003	WG and RR	21	1.98	3.24	5.89	2.18
October 2003		20	1.98	3.24	5.67	2.12
November 2003		18	1.98	3.24	5.67	2.12
December 2003	Widening band	17	1.98	3.24	5.23	1.99
January 2004		18	1.98	3.24	4.46	1.66
February 2004		20	1.98	3.24	4.57	1.68
March 2004		19	1.98	3.24	4.77	1.77
April 2004	RR		1.98	3.87	4.8	1.76
May 2004			1.98	3.87		1.81
June 2004			1.98	3.87		

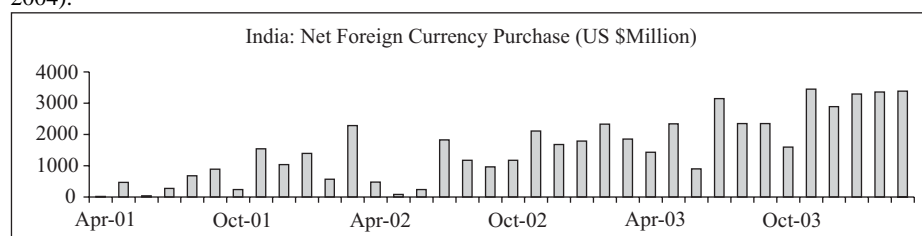
B. India (2001–2004)

1. Sterilization Intervention: Contending with Large Capital Inflows Engaged Monetary Policy in India¹⁶

In contrast to the PRC, the direct intervention or OMO is the major monetary tool in India.¹⁷ The Reserve Bank of India (RBI), the Indian central

¹⁵This may be reflected in the negligible effects on the aggregate money multipliers in April and May.

¹⁶Notice that India has been increasingly intervening in foreign exchange market (RBI 2004).



bank, cannot issue its own paper, ruling out the possibility of issuing central bank bills. Efforts to sterilize the expansionary impact of the capital flows, therefore, took the form of large open market sales and continuous repo operations under the Liquidity Adjustment Facility (LAF).¹⁷ Substantial sale of government bonds took place with high purchases of US dollars while changes in reserve requirements were not used. The net sales of government-dated securities through OMO peaked in October 2003 reaching RP139 billion before the magnitude of intervention slowed somewhat (see Table 10). Meanwhile repo transaction has increased in importance as a monetary tool (the magnitude of the transaction far exceeding that of dated securities) and the net absorption of the liquidity through LAF exceeded 500 billion rupees in March 2004.

As the liquidity surge persisted and demanded a more effective sterilization scheme, the Market Stabilization Scheme (MSS) was introduced in April 2004. Securities under the MSS are being issued with an initial overall ceiling of 600 billion rupees for 2004–2005. Treasury bills and/or dated securities issued under the MSS would be the same as those issued for normal market borrowings and as such they would fortify the conduct of sterilization operations without segmenting the government securities market. These are to be solely used as instruments of sterilization. In accordance with the MSS, the RBI conducted the sale (re-issue) of stabilization bonds amounting to 50 billion rupees in April 2004. Nonetheless, a shortage of rupee securities still limits the sterilization operation by the central bank.

As managing the exchange rate is becoming more challenging, the RBI is also seeking to diminish the large capital account surplus by relaxing exchange restrictions on resident investment abroad. The measures include introduction of a liberalized scheme of personal transfers up to \$25,000 in February 2004, removal of the restrictive clause of issuing Employees' Stock Option at concessional rates, and lowering interest rate on Indian nonresident deposit accounts.

Interest rates in India continue to decline as domestic liquidity surges. Although the continuous nature of OMO transactions makes it difficult to gauge the impacts of the sterilization activities, Table 10 reveals that short-run impacts

¹⁷The Liquidity Adjustment Facility (LAF), which was introduced on 5 June 2000 has provided a mechanism for central banks to modulate liquidity in the system and thereby influence short-term interest rates consistent with monetary policy objectives. The LAF operates through repo and reverse repo auctions. The LAF is operated both as a tool for liquidity management and for interest rate signaling depending upon market conditions. However, facing huge capital inflows, RBI has announced the revised LAF Scheme effective 29 March 2004. The scheme is now operationalized through the 7-day fixed rate repo conducted daily, and overnight fixed rate reverse repo conducted daily on weekdays.

¹⁸Cash reserve ratio (CRR) remains an important instrument for modulating liquidity conditions. The medium-term objective is, however, to reduce CRR to the statutory minimum level of 3.0 percent. Therefore, CRR has not been used to sterilize liquidity.

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exist albeit in small magnitudes. The highlighted months had relatively large OMO transactions. Except for the second half of 2002 and some other occasions, interest rates rose right after the substantial purchases of the dated securities. However, interest rates soon started to decline again, normally starting in the following month.

Table 10. India: Impact on Interest Rates and Money Multipliers

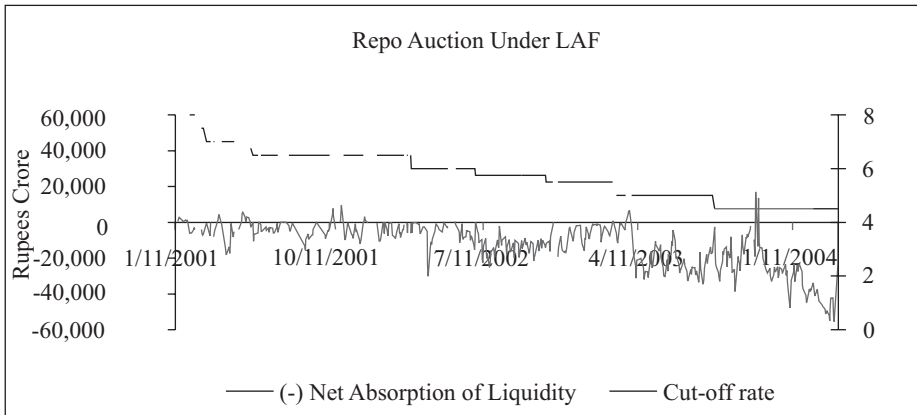
		Dated Securities Transaction (millions local currency, (-) net sales)	Credit Growth (percent)	Bank Deposit Rate 90-180 Day	Bank CD Rate 91 Day	T-Bond Rate (1 year)	Call Money Rate	Repo Rate	BRPAD Money Multiplier	Narrow Money Multiplier
Jul	2001	-5,092	9.7	7.25	8.50	7.52	7.10	6.5	4.22	1.81
Aug	2001	-10,263	9.5	7.25	8.50	7.20	6.92	6.5	4.26	1.76
Sep	2001	3,094	8.0	7.25	8.55	7.40	7.00	6.5	4.38	1.75
Oct	2001	83	9.2	7.25	8.20	7.17	6.95	6.5	4.27	1.79
Nov	2001	-26	6.3	7.00	7.50	6.74	6.65	6.5	4.21	1.71
Dec	2001	-7,865	3.9	7.00	7.75	6.85	6.67	6.5	4.28	1.65
Jan	2002	-84	5.0	7.00	7.80	6.95	6.73	6.5	4.27	1.75
Feb	2002	-27	4.7	7.00	7.30	6.35	6.25	6.5	4.28	1.74
Mar	2002	-37	6.0	6.75	7.50	6.20	6.07	6.0	4.12	1.72
Apr	2002	-5,307	6.7	6.75	7.50	6.10	6.01	6.0	4.17	1.77
May	2002	-1,520	14.2	6.75	8.00	6.60	6.40	6.0	4.27	1.75
Jun	2002	-179	14.4	6.75	7.75	6.70	6.27	5.75	4.58	1.77
Jul	2002	-6,515	16.7	6.75	7.00	6.00	5.70	5.75	4.43	1.78
Aug	2002	-7,111	16.3	6.75	6.43	6.00	5.75	5.75	4.49	1.78
Sep	2002	-6,192	17.3	6.75	6.30	5.95	5.74	5.75	4.62	1.79
Oct	2002	-43	15.1	6.75	6.30	5.90	5.73	5.5	4.63	1.75
Nov	2002	-10,968	17.2	6.75	6.05	5.57	5.51	5.5	4.57	1.62
Dec	2002	-4,512	17.8	6.25	5.70	5.55	5.42	5.5	4.57	1.62
Jan	2003	-10,900	17.6	5.75	5.60	5.50	5.30	5.5	4.58	1.70
Feb	2003	-88	17.2	5.75	5.78	6.00	5.67	5.5	4.56	1.74
Mar	2003	-66	15.9	5.75	6.00	5.78	5.75	5.0	4.36	1.73
Apr	2003	-15	11.3	5.50	5.60	5.30	5.11	5.0	4.37	1.78
May	2003	-5,502	6.7	5.50	5.00	4.90	4.42	5.0	4.29	1.80
Jun	2003	-43	6.5	5.25	4.95	5.06	4.90	5.0	4.38	1.79
Jul	2003	-88	5.7	5.25	5.00	5.02	4.92	5.0	4.48	1.82
Aug	2003	-11,422	5.8	5.25	4.95	4.85	4.88	4.5	4.58	1.78
Sep	2003	-5,083	5.6	5.00	4.75	4.70	4.58	4.5	4.74	1.82
Oct	2003	-13,855	6.4	5.00	4.77	4.48	4.40	4.5	4.52	1.82
Nov	2003	-81	6.1	5.00	4.72	4.50	4.37	4.5	4.48	1.51
Dec	2003	-150	5.5	5.00	4.63	4.40	4.15	4.5	4.54	1.68
Jan	2004	-5,198		5.00	4.64	4.50	4.20	4.5	--	1.77
Feb	2004	-35		5.00	4.75	4.55	4.37	4.5	--	1.85
Mar	2004	-126		5.00	4.78	4.40	4.19		--	
Apr	2004			5.00	4.80	4.50	4.24		--	
May	2004			5.00	4.82	4.51	4.37			
Jun	2004			5.00	4.82	4.60	4.47			

Sources: DataStream, author's calculations, and RBI website.

2. Impacts of Sterilization

Significant changes took place only twice since 2002: April 2002 and January 2003. The first reaction, where interest rates rose by 0.5 percent in April 2002, was the time when the RBI started intensive repo transactions (Figure 5)—6 days of which exceeded RP100 billion. The money market rates and bond yield again rose by about 0.4 percent in January 2003. While repo transactions were not so active this time, the increase was perhaps driven by the intensive purchases of dated securities preceding the month. The credit growth as well as narrow money multiplier also dropped from 17.8 to 5.6 percent and from 4.6 to 4.3 percent, respectively. Nonetheless, the declining trend of credit growth soon reversed in October 2003.

Figure 5. India Sterilization Intervention Efforts—REPO Transaction



Note: Data is of 1-day repo transaction.

Source: Reserve Bank of India.

As driven by the increasing absorption of liquidity through repo transaction and the liberalization of capital outflows, interest rates have shown signs of increasing in the second quarter of 2004—a sign of sustained effectiveness of the sterilization intervention. Nonetheless, as was seen with the PRC case, Indian sterilization policies so far generally reveal short-lived impacts. Also, the initial phase reaction to the removal of outflow restrictions policy in India appears that more flows are coming in than going out in March, though the policy uncertainty of the new coalition government and changes in global stock market dynamism induced net outflows in May. Despite the sterilization efforts, inflation exceeded 8 percent in August, and the RBI had to respond by increasing the cash reserve ratio by 25 basis points in September, and is planning another 25 basis points increase in October.

VI. INCENTIVES FOR MORE FLEXIBLE REGIMES

The managed exchange rate regimes are being tested for their feasibility and sustainability. While the efforts should focus to dampen currency fluctuation fed by the surge in capital inflows, this regime has gained more attention in maintaining a certain level. The PRC and India's experiences suggest that liquidity management is not an easy task: being affected by exogenous factors such as a hike in oil price as in India,¹⁹ and/or having to commit to the current exchange rate policy while pursuing development goals as in the PRC.²⁰ As inflows persist and reserves accumulate, the sterilization policy cannot be a lasting solution, and can be costly. As relaxing capital controls progresses further, the volatile financial flows will then challenge the still fragile domestic financial system. In this regard, the strongest policy lesson is the need for more freedom in policy options, which, with a strengthened financial system, would entail a reconsideration of existing exchange rate policies and practices. This section summarizes policy discussion surrounding the two countries and discusses factors that dominate the decision to move to a more flexible exchange rate regime.²¹

A. Managed to Misalign

Real exchange rates clear at the values that are warranted by fundamentals in the long run.²² Once the managed exchange rate level starts to deviate from the value warranted by the fundamentals, real exchange rates will adjust one way or another—inflation or revaluation. Garber (2003) argues that the fundamental global imbalance is not in the exchange rate. The fundamental global imbalance is in the enormous excess supply of labor in Asia now waiting to enter the modern global economy, particularly in India and the PRC. He estimates that there are 200 million underemployed Chinese who must be integrated into the global economy over the next 20 years. “This is an entire continent worth of people, a new labor force equivalent to the labor force of the EU or North America,” Garber explains. “The speed of employment of this group is what will in the end determine the real exchange rate” (Garber 2003).

¹⁹See Mukhopadhyay (2000) for the experience in the early 1990s.

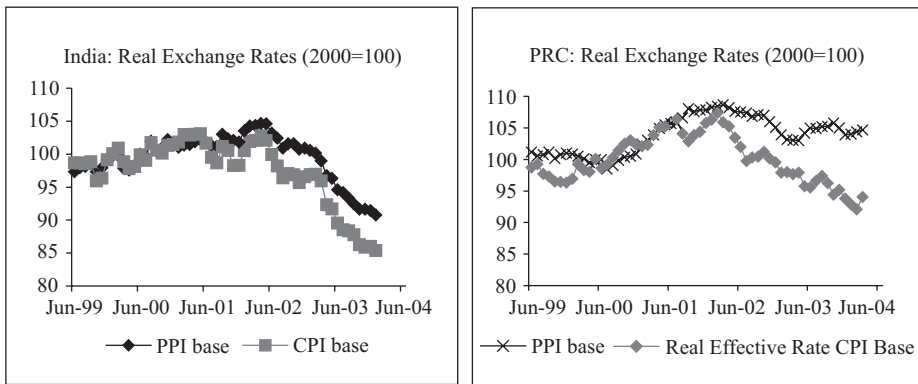
²⁰Not only that the usable monetary policy instruments are limited in less developed economies, but also which instruments to be used under which economic conditions is a complex and unsettled issue.

²¹ See Otani and Watanabe (2004) for general discussions.

²²See Krugman and Obstfeld (2001, chapter 15), for example, for the discussion.

Figure 6 shows two real exchange rates for India and the PRC: one based on consumer price index (CPI), and on producer price index (PPI).²³ While real exchange rates using direct measures such as wages and labor costs are hardly available, the PPI is used to measure international competitiveness. In India, both real exchange rates have been sharply appreciating since mid-2002, although the speed of appreciation appears slightly slow with the PPI base. On the other hand, the PPI base real exchange rate has been quite stable in the PRC unlike the rapidly appreciating CPI base real exchange rate—consistent with what Garber argues. The difference between the two rates appears particularly apparent during the last 2 years: the CPI-based exchange rate apparently appreciated by about 10 percent during the period while the one with PPI remain stable. This may reflect the fact that the abundant labor force with low wages pushes down the PPI in the PRC, and keeps the country’s products (industry sector) internationally competitive. Meanwhile, CPI is affected by surges in prices of some goods that do not directly affect producers.

Figure 6. Real Exchange Rates (PPI base vs. CPI base)



Note: PPI of OECD against PPI of the PRC is used for the PPI base real exchange rates.
 Source: DataStream.

Conversely, Burton (2004) argues that the PRC’s reserve accumulation cannot be sustained indefinitely without inflationary consequences. He says that even though the pool of low-wage labor is large, pressure will be placed on the prices of other scarce factors, including land and skilled labor. Against this background, Goldstein (2003) has proposed that the PRC reform its currency regime in two stages:

²³ PPI measures the average selling prices received by domestic producers for their output. The prices included in the PPI are from the first commercial transaction for many products and some services.

First, they switch from a unitary peg to the dollar to a basket peg with equal weights for the dollar, the yen, and the euro; they revalue by 15 to 25 percent immediately; and they widen the exchange rate band from less than 1 percent to, say, 5 to 7 percent. Step two, after they get the banking system on a sounder footing, which may take a few years, they open the capital account and float the renminbi. In this way, we don't ask the rest of the world to live too long with a seriously undervalued renminbi, and we don't ask (People's Republic of) China to repeat the lesson of the Asian financial crisis.

Meanwhile, concerns have been raised that it would be premature, for example, for the PRC to move toward exchange rate flexibility before resolving the weaknesses in its financial system. But this argument presupposes that greater flexibility would be accompanied by capital account liberalization that could trigger capital outflows. In fact, there is no reason why limited exchange rate flexibility should pose significant risks for the financial system, if capital controls stay in place. And experience in many other countries, with India as a relevant recent example, shows clearly that managed exchange rate flexibility can be successfully introduced before capital account liberalization has gone very far.²⁴

B. Capital Controls

The Institute of International Finance (IIF) forecasts that net private capital flows to emerging market economies are likely to grow to \$225 billion in 2004, following a gain of over 50 percent to \$194 billion in 2003. The robust volume of capital flows to emerging markets reflects ample global liquidity, low interest rates in mature markets, successful reforms in some emerging countries, and a progressive strengthening of activity in both the industrial and emerging market economies. In particular, IIF sees that Asia continues to account for the largest part of FDI to emerging markets with an expected total of \$62 billion this year, with the PRC alone seeing FDI inflows of around \$53 billion, compared to about \$49 billion in 2003. Nonetheless, countries like India, which has been increasingly receiving short-term portfolio flows, may be more concerned with outflows than others. It is generally agreed that capital flight is the major risk for the intermediate regime. Managing inflationary pressures while enjoying the blessing of capital inflows remains to be a challenge for capital importers.

Most economies in Asia underwent capital account liberalization starting in the mid-1980s. This liberalization trend was largely driven by the globalization

²⁴Effectiveness of capital controls is still an unsettled issue. See Edwards (1999), for example.

of financial flows. Unfortunately, the trend resulted in massive capital outflows during the Asian financial crisis—sudden stop of capital inflows. Consequently, a few countries (Indonesia, Malaysia, and Philippines) reversed this liberalization trend, and the capital accounts are currently only partially liberalized.²⁵ Conversely, economies such as Hong Kong, China; Japan; Korea; Taipei, China; and Thailand have continued with liberalization of their capital accounts till now, though minor restrictions remain.²⁶ Notably, further liberalization took place in Taipei, China in 2003, and control on investments in domestic shares by foreign funds was lifted.

Alternatively, countries that were not directly affected by the Asian crisis, such as the PRC, India, Pakistan, and Viet Nam, for example, still maintain capital controls in almost all areas. In India, liberalization has mainly focused on direct and portfolio investments by nonresidents starting in 1991. In these areas, free entry and exit is now the normal rule. Significant easing has taken place in January 2004: the RBI abolished capital-size restrictions on overseas investments by Indian companies, and eased discretionary rules on external commercial borrowings. Further, controls on personal transfers abroad up to \$25,000 have been lifted recently. However, debt-creating external borrowing is tightly controlled, particularly if short-term. Also banks and money markets generally face significant restrictions on their foreign operations as capital outflows by residents continue to be strictly forbidden. For the PRC, inward FDI was the first to be liberalized in the early 1990s. However, the liberalization of capital restrictions on other areas has been very little, and flows are still tightly restricted and need layers of permission, even if possible.²⁷ These controls are largely asymmetrical, restricting outflows more than inflows, and hence providing upward pressure on the currency value.

In India, the experience with liberalization of inward capital flows has been similar to the economies of Latin America and crisis-hit Asia, and only the magnitude of these flows has not been large enough to cause serious macro and micro management problems. The net capital inflows reached 8-9 percent of GDP in 1996 in the crisis-hit economies as opposed to only 1.9 percent in India in 2003 (Table 11). Nonetheless, the Indian government has taken steps to liberalize outflows of capital in 2004, which turned the Indian nonresident deposit accounts to net outflows since January 2004. But this, perhaps, is a risky proposition. For one thing, the embrace of full convertibility is itself likely to bring more dollars into the country in the initial phase and add to the existing upward pressure on the rupee. In fact, strong economic growth, continuing low interest rates, and the

²⁵Exchange control was introduced in Indonesia and Malaysia, for example.

²⁶Kaminsky and Schmukler (2003) document how Asian countries liberalized the capital accounts.

²⁷The PRC also maintains tariff and nontariff trade barriers not yet addressed by WTO accession, and a variety of export incentive programs.

strong performance of the equity markets suggest that reductions in payments restrictions have not significantly dampened reserves growth.

Table 11. Net Capital Flows as a Percent of GDP

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Indonesia	0.0	-3.7	-0.9	1.6	-7.2	-7.1	-4.6	-3.5	-4.9	-3.2	-1.8
India	2.2	1.6	1.2	0.9	0.7	0.3	1.1	0.2	0.5	0.4	1.9
Korea	0.6	2.1	3.2	4.7	-0.8	-3.0	-0.4	2.5	-0.1	1.2	3.3
Malaysia	19.3	2.3	7.7	8.3	0.6	-7.6	-9.6	-9.4	-6.2	-5.5	-3.8
Pakistan	2.7	1.1	2.2	1.4	-1.3	3.7	2.4	2.8	2.2	1.7	1.0
Philippines	0.3	4.7	1.4	4.3	-3.9	-5.0	-15.7	-14.3	-11.3	-10.6	-7.0
PRC	4.5	6.2	7.5	6.0	2.6	-0.6	-0.4	-0.7	3.3	2.8	4.4
Thailand	8.2	8.5	12.3	9.3	-4.6	-11.5	-6.4	-8.9	-4.2	-2.2	-5.5
Viet Nam	18.6	9.9	13.7	9.3	6.9	4.1	0.5	-3.2	-1.1	2.8	3.6

Source: Institute of International Finance.

In sum, risks of capital flight are limited as long as capital controls stay in place. Nonetheless, further loosening of controls on capital outflows combined with the past evidence of ineffective capital controls in some countries poses a risk of outflows. There are also external factors. As recovery in mature markets emerges and liquidity surge in Asia drive down domestic interest rates, the interest rate differentials would narrow further, which would certainly work as a pull factor out of emerging markets.

C. Export-led Growth Strategy

Volatile exchange rate has been proven to have negative impacts on trade and FDI inflows. Therefore, a shift in the trade relationship would affect the currency regime—greater stability is preferred vis-à-vis the major trading partners. Therefore, if the US becomes less important as an export destination, the benefit of having stability against the US dollar will be smaller. In fact, intraregional trade has increased its importance in Asia driven by production sharing or vertical specialization. Consequently, the shares of intraregional trade have been steadily increasing, particularly in East and Southeast Asia. Against this background, the average trade weighted exchange rate has been fluctuating less than that against the dollar during the past years (Table 12), managed more against trading partner currencies. Also the exchange rate level developments reveal a striking depreciation of trade-weighted rates by 8 percent in the last 4 years (Table 13). “Moving out” of the US dollar does not seem a wise option yet, however, there is a motive to rely less on the dollar to pursue export-led growth.²⁸

²⁸Since most Asian currencies display limited variations against the dollar, variations between these currencies should also be relatively moderate. Thus the need to rely less on the dollar in light of increased intraregional trade seems to be low.

Table 12. Average Nominal Exchange Rate Variability
(Trade-weighted vs. US\$)

	2001	2002	2003	2004	2005
Trade-weighted	1.98	2.22	1.29	1.22	1.15
Against \$	2.63	2.80	1.40	1.31	0.21

Note: Countries include India, Indonesia, Japan, Korea, Pakistan, Philippines, Singapore, and Thailand. Data for 2004 includes up to April.

Sources: *International Financial Statistics* (IMF various years) and DataStream.

Table 13. Average Nominal Exchange Rate
(Trade-weighted vs. US\$)

	2001	2002	2003	2004	2005
Against \$	100.0	108.6	107.0	104.3	102.4
Trade-weighted	100.1	103.6	102.8	105.9	108.4

Note: Countries include India, Indonesia, Japan, Korea, Pakistan, Philippines, Singapore, and Thailand. Data for 2004 includes up to April.

Sources: *International Financial Statistics* (IMF various years) and DataStream.

D. Currency Mismatches

Borrowing in domestic currencies is not easy for many in Asia as credible domestic policies, and sound and deep financial system are preconditions. Furthermore, even if these conditions are satisfied, many countries in the world cannot raise funds in their own currencies. This creates a currency mismatch in banks and firms' balance sheets, which makes the economy vulnerable to currency fluctuations, justifying a policy to manage its currency against the borrowing currency—normally US dollar—to minimize an exchange rate risk.

While the potential balance sheet imbalances are hard to measure, a rough indicator for a currency mismatch can be a ratio of bank foreign liabilities as a percent of bank foreign assets. Table 14 suggests that the currency mismatch does not appear too significant in the PRC's banks, while the ratio has been increasing in Korea and Malaysia, exceeding 1.6 at some point in 2003. This is probably due to the fact that capital inflows having been taking the form of portfolio flows in Korea and Malaysia, which are intermediated by banks, while it is more as FDI in the PRC. The banks' exposure to the exchange rate risk appears minimal at this time in the PRC indicating that a revaluation, if any, would not have a detrimental effect on the banks' balance sheets. However, effects on firms are unclear, and newly established private financial intermediaries and firms could easily be chosen for raising funds in foreign currency, which will be less costly. The ongoing efforts to create an Asian bond market could change this map in the long run, but not in the short run.

Table 14. Currency Mismatches in Banks
(Average foreign liabilities as a ratio of foreign assets)

	Philippines	Malaysia	Korea	Indonesia	Hong Kong, China	Singapore	PRC	Thailand	Japan	Viet Nam
1999	1.38	1.41	0.79	0.83	0.80	0.47	0.68	1.31	0.69	N/A
2000	1.34	1.14	0.75	0.89	0.74	0.45	0.49	0.99	0.69	N/A
2001	1.20	0.69	0.72	0.72	0.69	0.43	0.34	0.65	0.70	0.14
2002	1.06	0.97	1.05	0.58	0.63	0.37	0.31	0.63	0.72	0.14
2003	0.91	1.40	1.51	0.53	0.60	0.26	0.35	0.59	0.72	0.19
2004	0.90	1.27	1.25	0.40	0.62	0.19	0.38	0.58	N/A	N/A

Source: DataStream.

E. Dollars for Trade Transaction

As long as the US remains to be the largest economy, it is unlikely that the US dollar will lose its status as the anchor currency in trade transactions. As Asian economies grow, their currencies would surely become relatively important as a result. However, transition, as that experienced by the British pound to the US dollar after World War II, would not happen instantaneously given the relative economic size of the countries (Otani and Watanabe 2004).

In summary, there are possibilities that Asian economies will opt for more flexible exchange rate regimes and grow out of the US dollar in the long run, but this does not appear feasible in the short run. As far as capital controls are in place, the US remains to be a major trading partner, and no deep enough local/regional financial market exists to raise funds, the incentives to graduate out of the US dollar will remain weak. In the meantime, increasingly volatile financial flows would pressure some currencies that appear to deviate from the values warranted by macroeconomic fundamentals to adjust. Most of the Asian economies that are reviewed are likely to seek the intermediate regimes while keeping capital controls to avoid speculative pressures on their currencies.

VII. POLICY IMPLICATIONS AND CONCLUDING REMARKS

As examined, currencies in Asia have increasingly reduced their variability, and appear more managed suggesting monetary authorities' intervention in foreign exchange markets. However, the developments of exchange rate levels suggest that the intervention did not prevent nominal and real appreciation in several economies over the reviewed period. It is crucial to be reminded that the goal of sterilization is to dampen the amplitude of the real cycles fed by liquidity surges. The policy might be effective in the short run, but as inflows persist and reserves accumulate, the countries need to be ready for the eventual capital outflows and policy adjustments.

Intermediate regimes are vulnerable to shocks. Sterilization can be used in liquidity management in the short run, however the exchange rate policies and

practices may need reconsideration in countries such as the PRC and India in the medium term, which may entail a revaluation and greater flexibility of the currency. This transition would simultaneously entail a partial liberalization of the capital account (but not to the extent that causes sudden reversals of capital inflows) and greater transparency and stringency in monetary policy—conditions that are inevitable for the intermediate regime to be sustainable.

Nonetheless, moving to capital account convertibility, and perhaps exiting from the intermediate exchange rate regime remains to be a long-run solution for these countries. As the concerned countries are burdened with domestic problems, the general consensus is that reform efforts should go far enough before moving to capital account convertibility. Calvo and Mishkin (2003), among others, also argue that the key for macroeconomic success is not about which exchange rate regimes one chooses, but the development of good fiscal, financial, and monetary institutions. It suggests that less attention should be focused on the general question of whether a floating or a fixed exchange rate (or intermediate regime) is preferable, and more on deeper institutional arrangements. Therefore, this final section discusses some of the institutional reforms.

A. Banking and Capital Market Regulatory System

Unless banking standards are accordingly improved, viable competition introduced, and government interference reduced, it would be reckless to pursue full capital account convertibility, which requires flexibility, dynamism, and foresight in the country's banking and financial institutions. The increasing contribution of portfolio capital toward the capital account, and the fact that these inflows could increase to significant levels in the future as financial markets get integrated globally, show that an important area of concern is their skillful management to facilitate smooth intermediation. Banks intermediate a substantial amount of funds, e.g., over 64 percent of the total financial assets in India. As partially initiated in the PRC, undercapitalization and nonperforming loans of banks are concerns that need to be immediately addressed.

B. Transparency and Discipline in Fiscal and Financial Policies

It is well known that the last thing that a government wanting to gain the confidence of investors should do is to be fiscally imprudent. Asia has been relatively prudent in government spending, except for perhaps India. In India, the ratio of gross fiscal deficit to GDP increased to 11 percent in 2003 from 6.2 percent in 1996–1997. Such high fiscal deficits can prove to be unsustainable and can frighten investors away. Hence, there is an immediate need for putting brakes on government expenditure, and until that has been satisfactorily done, opening

up the capital account fully would carry with it a big risk of sudden loss of faith of investors as well as capital flight.

C. Trade Liberalization

Further trade liberalization will stimulate imports and create the necessary demand for dollars, mopping up the excess supply of dollars and relieving the government of the burden of low-yielding foreign exchange reserves. While the PRC lately reversed the liberalization trend by imposing quota on raw material import, the general trend should be to encourage import liberalization.

APPENDIX

Table A1. Growth Rate of Share Price Index
(Percent)

	PRC	Japan	India	Taipei,China	Korea	Indonesia	Malaysia	Thailand	Philippines	Pakistan	Hong Kong, Singapore China	
2000	30	-2	0	-17	-29	-25	-0	-35	-37	N/A	16	-3
2001	3	-23	-29	-34	-18	-16	-22	-5	-31	N/A	-21	-15
2002	-19	-19	-2	6	33	13	10	20	-25	N/A	-16	1
2003	-6	-4	27	2	-8	16	2	37	4	71	-1	1
2004	11	30	87	43	47	90	34	88	44	97	44	58

Note: Average annual rate; average of the first quarter for 2004.

Source: DataStream.

Table A2. De Facto Exchange Rate Management

Economy	Description from the Central Bank
India	Since 1993 India has had a market-determined exchange rate regime, under which the rupee is no longer pegged to a basket of currencies. Although the RBI has reduced its interference and has said repeatedly that it does not target any specific rate for the rupee, its stated priorities are to maintain orderly conditions in the forex market, meet temporary demand/supply gaps and to “curb destabilizing and self-fulfilling speculative activities.” Thus the RBI has stepped in decisively and successfully to curb speculation, by measures such as tightening liquidity.
Korea	Since 16 December 1997 the Korean won has been a floating currency that finds its exchange rate in the market. On that day, the government abolished the daily interbank foreign-exchange band and adopted the “free-float” system, a bold move aimed at discouraging forex speculation and restoring a supply and demand balance in the currency market at the peak of the 1997–1998 financial crisis. After floating the won, the Bank of Korea kept a low profile on the forex market as the won gradually stabilized. It closed its forex window to private financial institutions effective 15 May 1998. Its intervention is now limited to smoothing operations consistent with a steady build-up in foreign reserves.
Philippines	The Bangko Sentral ng Pilipinas (BSP) maintains a freely floating Philippine peso whose value is determined, to a great extent, by supply and demand factors. The BSP, however, intervenes during what it perceives to be speculative fluctuations of the peso against the dollar, and buys and sells the dollar using its international reserves.
Singapore	The Singapore dollar floats freely according to market forces, but its level is monitored closely by the government through the Monetary Authority of Singapore, which keeps the currency within a specified range measured against a basket of currencies. Although the make-up of the basket is not disclosed, it is understood to be a weighted grouping of the currencies of Singapore’s major trading partners (which would give the US dollar the single largest weighting), as they are the main sources of imported inflation.
Japan	The Japanese yen floats freely against all major currencies, but the Bank of Japan (BOJ) does intervene to counter speculation in an attempt to keep exchange rates consistent with official policy. The Ministry of Finance is closely involved in the BOJ’s currency market intervention because of its domestic and external economic policymaking role. Because of the enormous size of the international foreign exchange markets, the ability of the BOJ to influence exchange rates has been severely limited in recent years. Although news of intervention does have a short-term impact on the market, it is no longer considered an effective tool for long-term manipulation of foreign exchange rates.
Thailand	Since July 1997 the baht has been freely traded against all other currencies under a “managed float” system that empowers the Bank of Thailand to intervene in support of the currency or to prevent it from appreciating to a level where it might affect export competitiveness. The current system replaced the pegging of the baht according to a trade-weighted method using a basket of currencies dominated by the US dollar, which had been in use between 1984 and 1997. On the whole, the managed float system has remained intact under the current

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government, which has intervened against excessive weakness or strength in the currency without targeting specific rates.

Taipei,China	The currency is determined by the market. However, when the market is disrupted by seasonal or irregular factors, the central bank steps in.
Pakistan	The [Central] Bank is responsible for keeping the exchange rate of the rupee at an appropriate level and preventing it from wide fluctuations in order to maintain competitiveness of exports and maintain stability in the foreign exchange market.... [I]t was decided to adopt the managed floating exchange rate system under which the value of the rupee was determined on a daily basis, with reference to a basket of currencies of Pakistan's major trading partners and competitors. Adjustments were made in its value and when the circumstances so warranted.

Sources: Economist Intelligence Unit except for Taipei,China, which is Central Bank of China; and Pakistan, which is State Bank of Pakistan.

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