

India: Selected Issues

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INDIA

Selected Issues

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I. COMPETITIVENESS AND EXCHANGE-RATE POLICY¹

1. **This paper presents background information to the staff's assessment of competitiveness and exchange rate policy in India.** It examines the following questions:

- How has India's competitiveness evolved in the recent period?
- How have India's exports evolved, and what have been the driving factors?
- How does the CGER framework assess the level of India's exchange rate?
- How has exchange rate policy been conducted, and what effects has it had?

While the rupee has appreciated significantly in the recent period, export performance has nonetheless remained favorable, driven in part by structural factors, and the rupee does not appear to be out of line with fundamentals. Intervention has been sizeable, but recent empirical analysis produces no evidence that it has influenced the level or rate of change in the exchange rate (there is modest evidence that it may have dampened volatility, consistent with the authorities' stated aims).

A. How Has Competitiveness Evolved?

2. **The rupee has appreciated significantly during 2007, raising concerns about competitiveness.** In nominal bilateral terms vis-a-vis the dollar, the appreciation has been particularly notable, reaching successive nine-year highs as it rose about 12 percent. Although the increase has been less in nominal and real effective terms—only about 7–7½ percent—the appreciation of the real effective rupee has taken it out of the historical range in which it fluctuated during most of this decade.

3. **An examination of India's own historical experience and that of other countries supports the idea that the exchange rate is not the sole determinant of competitiveness or export performance.** In particular, a weakening rupee does not guarantee that exports will grow faster, as evidenced by India's experience during the 1970s and 1980s: despite the fact that the rupee lost more than half its value in real terms against the U.S. dollar, India's share in world trade fell from 0.75 percent to about 0.5 percent. The international experience supports a similar conclusion. In recent years, Asian exports have been growing rapidly despite significant real currency appreciation. In Korea, for example, the won appreciated by about 23 percent in real effective terms between 2003 and 2006—and export growth

¹ Prepared by Hiroko Oura, Petia Topalova, Andrea Richter-Hume, and Charles Kramer.

averaged 20 percent per year. Exports in Indonesia and Thailand have also grown rapidly despite large appreciation.²

4. **India has also managed to expand its exports rapidly despite real appreciation.** Since 1992, the rupee has been on a mildly appreciating trend (though exhibiting considerable volatility), and India's share in world goods exports has roughly doubled. It is interesting to note that the fastest export growth since 1974—30 percent—occurred in 2005, when the rupee appreciated by over 4 percent in real effective terms.

5. **These examples show that export performance clearly depends on factors beyond the value of an economy's currency, with productivity growth particularly important in this regard.** The experience of some of Asia's fastest growing emerging economies is particularly noteworthy. In Korea, for example, productivity growth in industry averaged 6.2 percent per year during 1972–2004, compared to 2.1 percent in the United States and 2.4 percent in Japan.³ China's productivity grew even faster, averaging 6.8 percent per year.

6. **India's productivity growth is indeed rapid compared with other countries.** The September 2006 *World Economic Outlook* found that India's total factor productivity growth has averaged about 3½ percent in recent years, which within Asia is only exceeded by China. Other recent growth accounting exercises have found TFP growth for India in the range of 3.2–3.5 percent for the recent period (see Oura, 2007). Studies suggest that the rapid productivity growth—and more generally, India's growth takeoff—is the product of reforms launched in the 1990s, in which licensing requirements, financial activities, and FDI were successively deregulated, and trade tariffs slashed. More recently, productivity has likely been spurred by the wave of corporate restructuring that occurred earlier this decade, which brought down corporate leverage to low levels.

7. **At the same time, selected industries have lagged in export performance, but these are generally industries where productivity has lagged as well.** These industries include gems and jewelry, textiles, and agriculture; notably, total factor productivity growth in agriculture is estimated at only one-half that of industry and one-eighth that in services.⁴ Moreover, this recent pattern of export performance appears to be an extension of past trends,

² Several countries—notably Japan and Korea—have been able to sustain rapid export growth over several decades despite significant real currency appreciation. The Balassa-Samuelson effect provides an explanation for this in some cases. As the relative productivity of labor in tradables rises, wages in this sector increase, in turn raising demand for nontradables. This drives up average prices and causes the real exchange rate to appreciate. While this effect has been found to hold empirically for Japan and other advanced countries, evidence of its relevance in emerging economies is weaker.

³ Industrial productivity data (April 2007 WEO) are used as a proxy for productivity in the tradables sector.

⁴See Bosworth and Collins (2006).

suggesting that it may not have that much to do with the recent movement in the exchange rate. This chapter next turns to a closer examination of this longer-term phenomenon.

B. Trends in Export Performance

8. **Between 1988 and 2005, India's real exports of goods increased 500 percent, doubling India's share in world exports and far outstripping GDP growth (Figure I.5).**

Using disaggregated customs data on India's trade over this time period, this section describes the pattern of this impressive export performance, including the change in the structure of exports, notably the breadth of products and markets versus specialization, and the shift in the value chain towards more skill-intensive and capital-intensive products. Analysis of these structural changes puts in perspective the relative importance of rupee appreciation in driving export performance.

9. **The data source for this analysis is the UN COMTRADE database which provides disaggregated bilateral trade flows for a large number of countries.** The data on Indian exports at the HS 6-digit product level (about 5,000 products), is available on an annual basis from 1988 to 2005.⁵ Products were matched to industry (NIC-1987) codes⁶ and skill-intensity and capital-intensity at the industry level was obtained from the Annual Survey of Industries.

10. **At an aggregate level, India's export growth picked up sharply in this decade, accompanied by a shift in the composition of India's exports.** Figure I.6 decomposes total merchandise exports by broad industrial groups (SITC-1) at three points in time: 1988, 1999 and 2005. The decline in the relative importance of agricultural products (SITC 0, 4) and light manufacturing (SITC 6) was offset by a shift towards the more sophisticated machinery and capital goods manufacturing (SITC 7) and chemicals (SITC 5). While the exports of raw materials, mineral fuels and oils (SITC 2, 3) were on a steadily declining path for some time, 1999 marked a reversal of this trend as exports of petroleum oils consistently outperformed the average rate of export growth. The change in the export structure in India is not nearly as pronounced as in China where the share in total exports accounted for by machinery and capital goods nearly tripled in 13 years to reach more than 30 percent (see Amiti and Freund, 2007). Yet, the evolution of India's export composition suggests that India is slowly and steadily moving up the value chain.

11. **At a more disaggregated level, India continued to expand its already rather diversified product and destination base.** The number of goods exported increased gradually from 3,662 in 1998 to 4,687 in 2005 (Figure I.7) out of a total of 5,000 distinct HS-6 product categories. India's exports reached 225 markets in 2005, compared to 165 in

⁵ Real exports were obtained by deflating the reported U.S. dollars values by the U.S. GDP deflator.

⁶ HS codes were matched to NIC 1987 using the concordance by Debroy and Santhanam (1992).

1988, with countries such as China, Singapore, United Arab Emirates receiving a substantially larger share of total exports relative to the past. The average number of destinations per product tripled to 30 countries (Figure I.8). Following recent convention in the trade literature (Schott, 2004), products exported to different destinations can be treated as different “varieties.”⁷ The growth in number of products and destinations bolstered a sharp increase in the number of varieties exported, especially in the last five years covered here (Figure I.7).

12. **But how important, in terms of value, are these new products and varieties?** To answer this, one may decompose the growth in exports into growth in existing products/varieties (the intensive margin) and new product/varieties (the extensive margin), as in Hummels and Klenow (2005).

$$\begin{aligned} \Delta VT / VT_{1988} &= (VT_{2005} - VT_{1988}) / VT_{1988} \\ &= \sum_{I \text{ exist } 1988} (V_{i,2005} - V_{i,1988}) / VT_{1988} + \sum_{k \text{ Do not exist } 1988} V_{k,2005} / VT_{1988} \end{aligned}$$

Where VT_{2000} is the volume of India's exports in 2005; $v_{i,2000}$ is the value of exports of good/variety i in 2005; P_{1988} is the set of products/varieties India exported in 1988.

The first term in the equation captures the contribution of the intensive margin (i.e., exporting more of the same goods/varieties), while the second term represents the contribution of the extensive margin (the new goods/varieties exported).

- The extensive margin in terms of products (or the 1000 products India added to its export bundle) accounted for 9 percent of the increase in exports in India between 1988 and 2005. The contribution of new products appears to be relatively small owing to the fact that India already exported three-fourths of the possible product categories by 1988, leaving little room for expansion. As suggested by Amiti and Freund (2007), further downward bias may be introduced by keeping the set of possible products constant over time, while new exports could be in different sub-classifications.
- In terms of varieties, on the other hand, the extensive margin contributed more than 60 percent of the growth in exports, suggesting that half of the increase in exports came from exporting existing products to new destinations. This finding is in contrast with the experience of China, where new varieties accounted for only 16 percent of export growth over the 1992–2005 period (Amiti and Freund, 2007).

⁷ Thus, when India expands its exports of tea to a country that previously was not importing Indian tea for example, the number of exported varieties rises.

13. **Consistent with the introduction of new products and varieties, the concentration of India's exports declined.** Figure I.9 plots the share of the top 5, top 10, top 50, top 100, and top 500 export products in 1988, 1999, and 2005. Over time, a smaller share of total exports is accounted for by a given number of products. This pattern is confirmed by a decline in the Gini coefficient of export distribution, which decreased from 0.95 to 0.91 over this time period.

14. **In addition, exports have become more skill and capital intensive, suggesting a shift towards products higher in the value chain.** To measure the change in skill-intensity of India's exports, HS 6-digit products are matched to industry codes used in the Annual Survey of Industries. Each product is assigned the skill intensity of its corresponding industry, where skill intensity is measured as the ratio of non-production to total workers in the industry as reported in 1991. Similarly, the industry's capital to labor ratio is used to capture the capital intensity of the product. Following Zhu and Trefler (2005), products are ranked from those that use the least amount of skilled labor/capital to those that use the most. The cumulative export shares are then plotted against the skill/capital intensity in 1988, 1999 and 2005. A shift to the right implies an increase in the skill/capital intensity of India's exports. Figures I.10 and I.11 present the findings. For both skill and capital intensity, one sees a marked shift of the curve to the right, especially after 1999. India's exports are becoming both more skilled-labor intensive and more capital-intensive.

15. **Similarly, the sophistication of India's exports marked a small improvement.** A measure of sophistication of a country's export basket, suggested by Rodrik (2005), assigns an "income" coefficient to each product based on the weighted average of the incomes of the countries exporting the product. These "income" coefficients of the various products are averaged using the export shares in a particular country's export basket as weights to arrive at the income level "embedded" in the exports. Figure I.12 plots the log of this measure of export sophistication for India over time, together with the evolutions of India's per capita real GDP. Even as early as 1988, the level of sophistication of India's exports was rather high relative to other countries at a similar level of development (Rodrik, 2007). Though outpaced by the growth in the standard of living, the sophistication of India's export bundle slowly creeps up, particularly in the last 5 years covered in this study.

16. **The shift in the composition of exports is significant, as it bears on the likely impact of rupee appreciation on competitiveness, and in particular on exporters' pricing power in global markets.** Exporters of more traditional manufactured goods (for example, textiles and leather goods), who produce commoditized goods and thus face stiff international competition, are likely to come under considerable pressure. While service sector exports are also likely to be impacted by the rising rupee, demand for these products is growing rapidly, suggesting that these exports are likely to continue growing too. In addition, some of the newer IT and outsourcing services may be more robust to exchange rate appreciation. In sectors where there is a focus on tailor-made solutions, exporters are likely to

command more pricing power, since purchasers of these services are unlikely to switch suppliers on the basis of relatively moderate exchange rate changes.

C. Perspectives on the Level of the Exchange Rate

17. **Analysis by the Fund staff’s Consultative Group on Exchange Rates (CGER) analysis finds the exchange rate to be “close to equilibrium.”** As the three approaches (macro balance, external sustainability, and reduced form equilibrium RER) all have similar findings, the macro balance approach (MB) is detailed here.⁸

18. **The MB approach asks two questions.** First, how far is the underlying current account balance from a benchmark level? Second, how large of an exchange rate adjustment would be required to move the current account balance from the underlying to the benchmark level? Each step is now addressed in turn.

19. **The “underlying current account” is the medium-term level of the current account purged of temporary factors.** For example, the projected medium-term current account deficit implicitly incorporates the lagged effect of historical exchange rate adjustments. For India, such adjustments result in an underlying deficit estimate of $2\frac{3}{4}$ percent of GDP.

20. **The benchmark current account is calculated based on characteristics of the economy in question.** In particular, a larger fiscal deficit translates into a smaller current account balance (lower domestic savings); a large and rising share of prime-age savers implies a larger balance (higher domestic savings); higher oil prices (for a net oil importer like India) imply a lower balance; and rapid growth and a lower per capita income imply a smaller balance, consistent with the idea that developing countries import capital as part of their development trajectories.

21. **For India, the fiscal balance, demographics and its level of development are all important drivers of the current account benchmark.** The fiscal balance (FB) results in a current account norm that is 0.7 percent of GDP lower than the average. The dependency ratio and population growth have offsetting effects—the latter reflecting the relatively rapid growth in prime-age savers—with a net upward effect on the current account balance equivalent to some 1.8 percent of GDP. India’s relatively high dependence on imported oil reduces its current account norm by about $\frac{1}{2}$ percent of GDP. Regarding India’s stage of development, per capita growth and its relative income reduce the current account norm by some $2\frac{1}{2}$ percent of GDP. The overall benchmark is thus about 3 percent of GDP, compared with an underlying current account of 2.7 percent of GDP.

⁸ The figures are based upon the Fall 2007 CGER exercise. Kohli and Mohapatra (2007) present an analysis of exchange-rate trends over 1980–2002.

22. **The implied adjustment in the exchange rate is then calculated as the adjustment needed to reconcile the underlying and benchmark current accounts.** The estimates are imprecise, in part due to the limitations of the underlying theory and associated empirical model, and in part due to the sampling error in calculating trade elasticities. While the attendant uncertainty is difficult to calculate, it could potentially be large.⁹ Nevertheless, the macro balance approach—like other estimates of exchange rate valuation—provides a useful benchmark for the level of the real exchange rate.

23. **For India, the methodology suggests an insignificant deviation of the real effective rupee from the level implied by the macroeconomic balance approach.** In particular, the deviation is only 3 percent, which is modest both in terms of the overall variability of the rupee and the underlying precision of the approach. The other two CGER approaches (the “equilibrium real exchange rate approach” which takes into account terms of trade and other fundamentals, and the “external stability” approach that gauges the exchange rate level by examining the stability of the external debt path) similarly find small deviations from estimated equilibrium.

D. Exchange Rate Policy and Intervention

24. **India’s *de-facto* and *de-jure* regime is a managed float.** India maintains an official policy of a managed float with no target or preannounced path for the exchange rate. Consistent with this, there has been significant flexibility in the exchange rate, measured in several ways (see Figure I.13)

- Historical volatility has increased over time, and now is at a level concomitant with that of other large emerging markets countries.
- Similarly, implied volatility—calculated from the prices of foreign exchange options—has risen over time, at a variety of maturities.
- The prices of so called “risk reversals” suggest that markets have a roughly symmetric point of view about the likely future path of the exchange rate.¹⁰
- A measure of overall flexibility that includes changes in reserves shows a degree of flexibility roughly comparable to other large emerging markets countries.

⁹ Kramer (1996) finds large confidence intervals for the equilibrium value of the Canadian dollar using a Monte Carlo approach to the macroeconomic balance concept.

¹⁰ The risk reversal reflects the relative prices of foreign currency puts and calls—e.g. options that pay off if the currency appreciates or depreciates respectively. If the prices are roughly the same, then market participants put roughly equal probability (or risk premium) on appreciation or depreciation.

25. **Amid sharply rising capital inflows, the Reserve Bank of India has intervened with the stated aim to smooth volatility in the exchange rate.** During January–October 2007 (latest available data), intervention amounted to about \$64 billion, consisting of purchases of foreign currency. This represents a sizeable increase over 2005 and 2006, when intervention through October registered around \$15 billion. During 2007, intervention has been highly variable from month to month, ranging from under \$2 billion (in August) to over \$12 billion (in October) but has consisted entirely of purchases: the most recent sale of foreign currency was conducted in December 2006, in the amount of about \$6.5 billion. The sizeable, one-directional intervention, and the large increase compared with prior years, raises a question about its effects on the rupee exchange rate.

26. **Research at the Fund and at the Reserve Bank of India (RBI) finds only limited effects of the RBI’s foreign exchange intervention on the rupee.** Research conducted for the Fund’s *Asia Pacific Regional Economic Outlook* (October 2007), using monthly data, found no evidence that intervention either reduced the level of the rupee against the dollar, or slowed the rate of appreciation, even after attempting to control for endogeneity (e.g., the fact that intervention responds to changes in the exchange rate, as well as vice versa) using two-stage least squares techniques (see the table). Indeed, the correlation between intervention (proxied by reserves changes) and the rupee/dollar rate implied that intervention was sometimes associated with a more *appreciated* rupee or a *faster* rate of rupee appreciation, consistent with intervention that “leaned against the wind.” There were some findings, albeit limited, that intervention was associated with lower exchange-rate volatility (consistently correct signs, but not consistently significant in a statistical sense). Similar findings were uncovered in a study conducted at the Reserve Bank of India (Pattnaik and Sahoo, 2003).

27. **Four factors could underly the lack of evidence for an effect of intervention.** First, persistent structural factors—such as a wide productivity differential in favor of India—may be driving the appreciation of the currency, limiting any effect of intervention beyond a short period. Second, it is possible that the sterilization necessitated by the risk of stoking inflation, lead to persistent interest differentials, consequent capital inflows, and thus limited observed effects on the currency.¹¹ Third, market participants may perceive that intervention does not portend coming changes in monetary policy—e.g., that intervention does not necessarily signal a looser-than-otherwise future monetary stance—limiting the effect through the “signaling channel.” Finally, the effects on market liquidity may be modest, given the high level of turnover in India’s foreign exchange market (some \$34 billion per day, according to the latest figures from the Bank for International Settlements).

¹¹ The notion that unsterilized intervention would affect the exchange rate is uncontroversial, as it would normally give rise to interest-rate changes that would affect currency values.

E. Conclusions

28. **The appreciation of the rupee appears to be largely an equilibrium phenomenon.** Consistent with this, the rupee does not appear to be out of line with medium-term macroeconomic fundamentals. Export performance has remained favorable, underpinned by structural improvements in the export sector, and more broadly by strong productivity growth. While intervention has risen in tandem with swelling capital inflows, empirical evidence suggests that intervention has served to dampen the volatility in the rupee, rather than to influence the level or rate of change in the currency. Going forward, continued efforts to maintain strong productivity growth, while allowing due flexibility in the currency, would be the best way to cope with any pressures on competitiveness likely to arise from any emergent currency appreciation pressures.

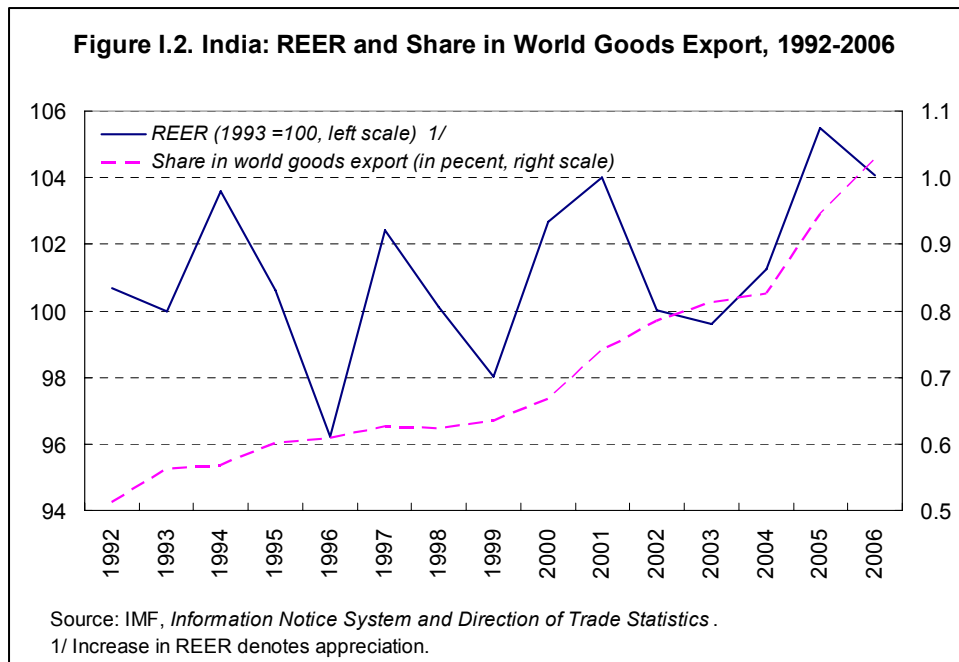
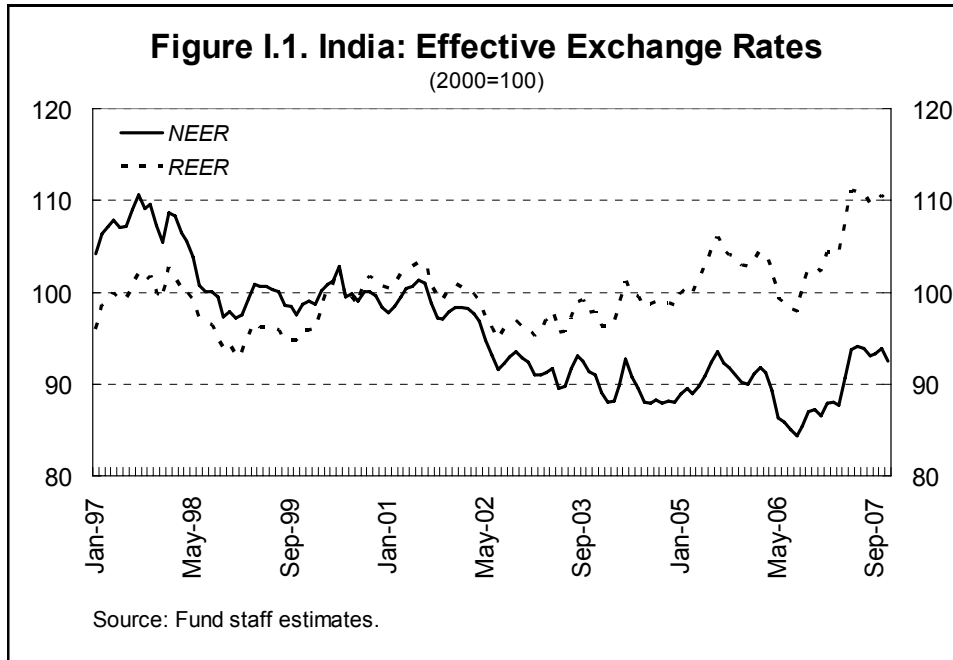
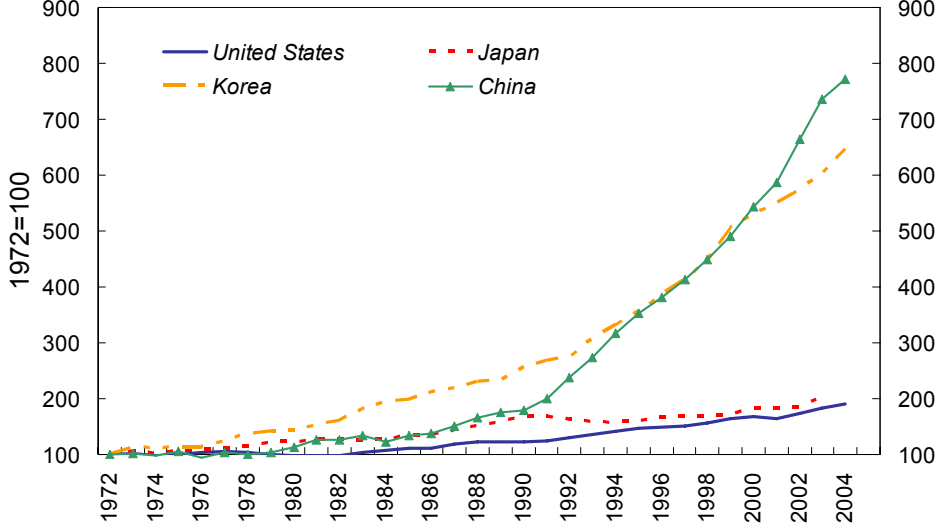
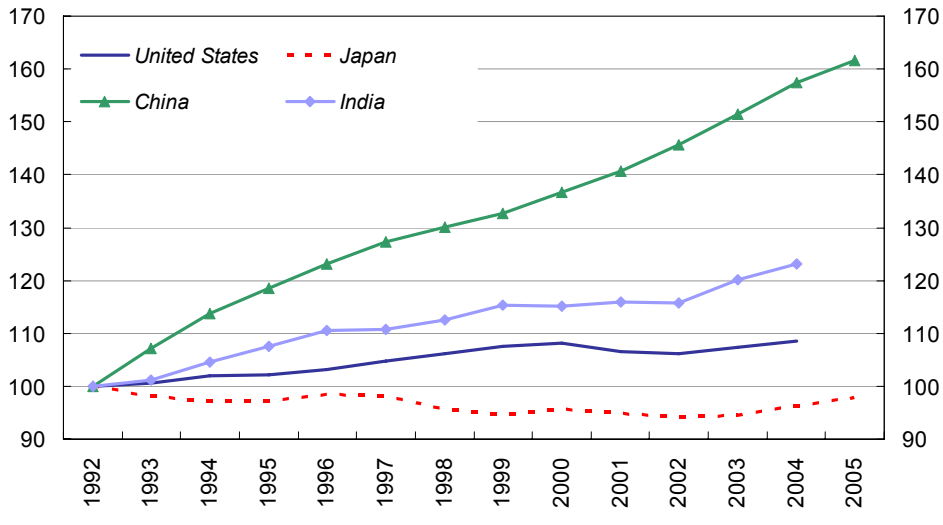


Figure I.3. Industrial Productivity: China, Korea, Japan, and the United States
(1972=100)

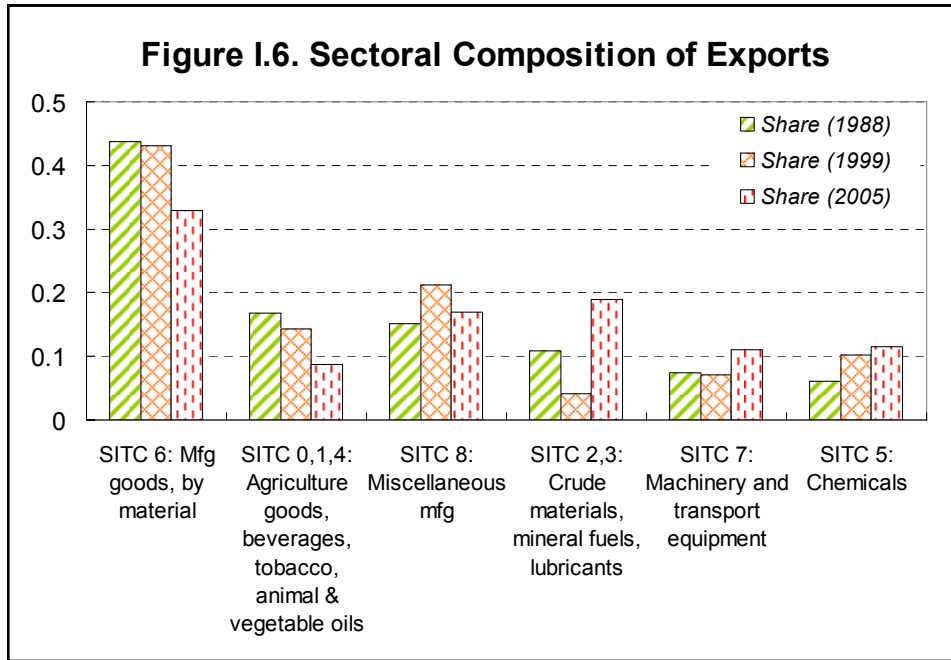
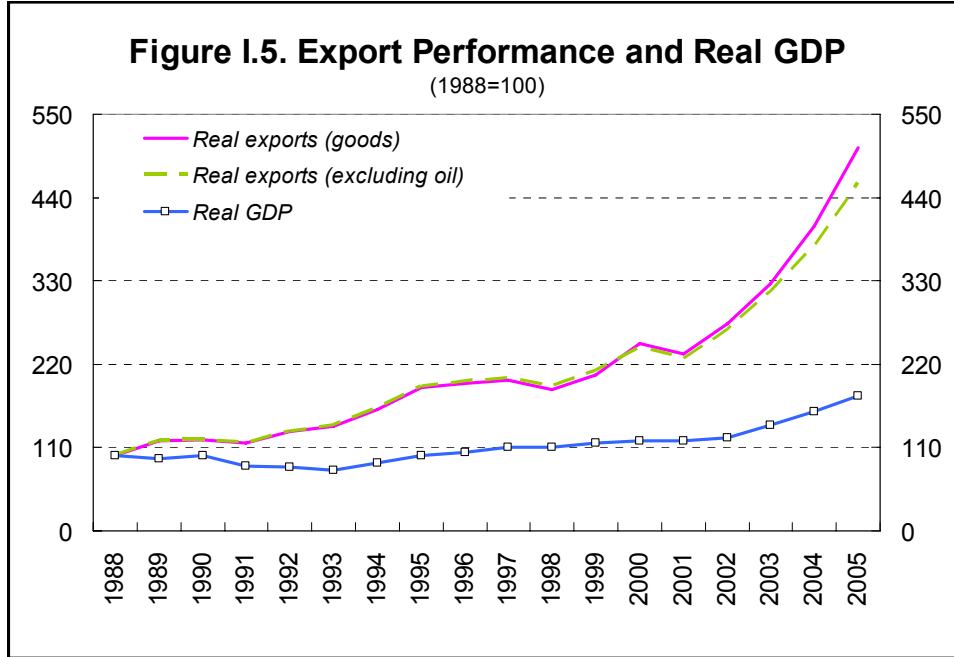


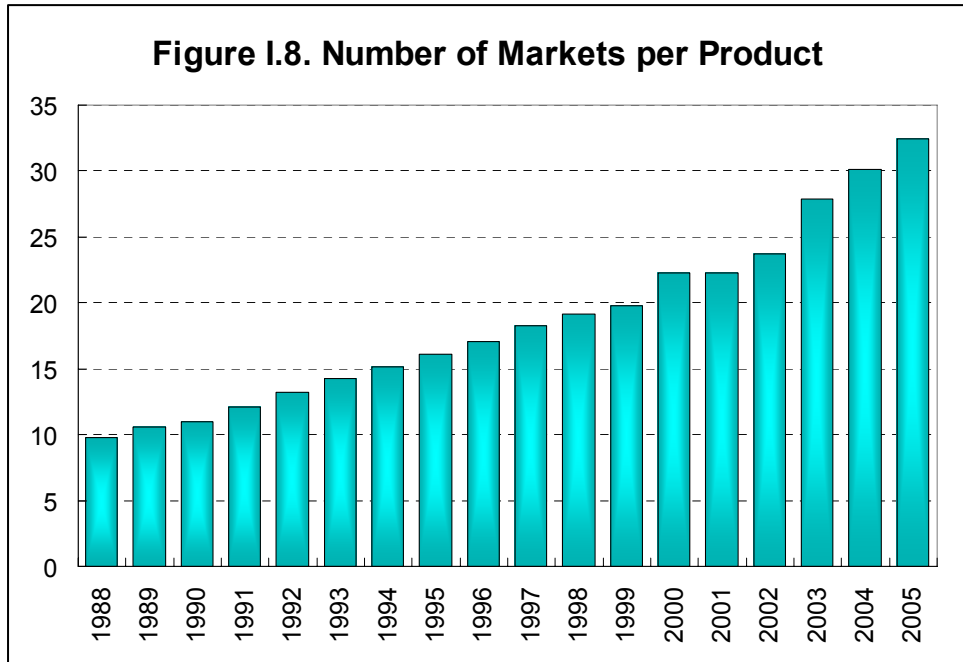
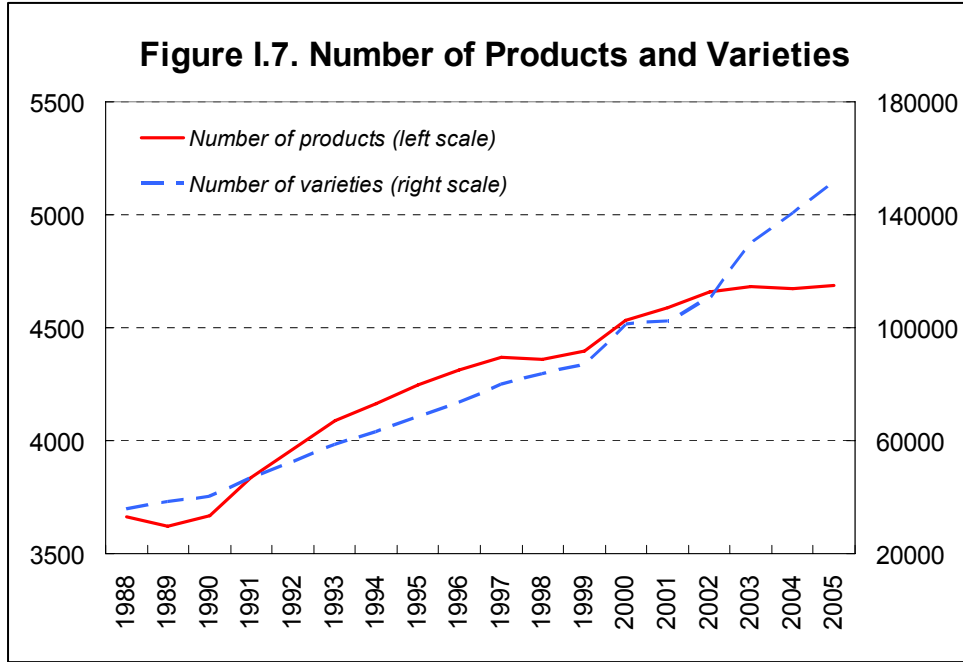
Source: WEO (April 2007).

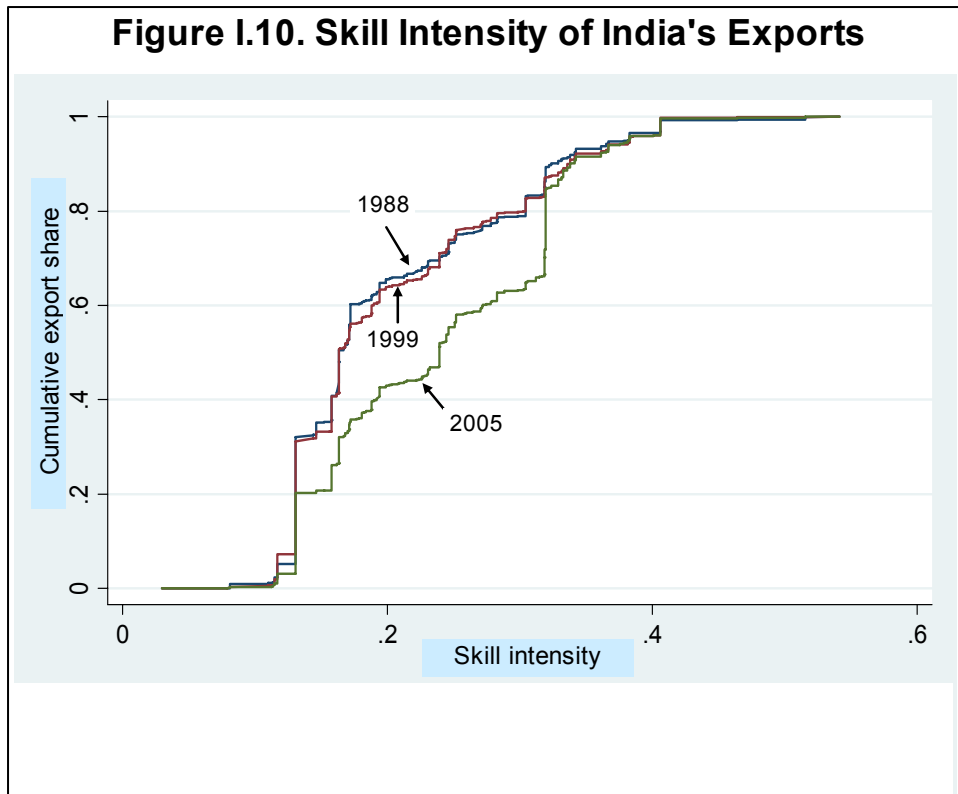
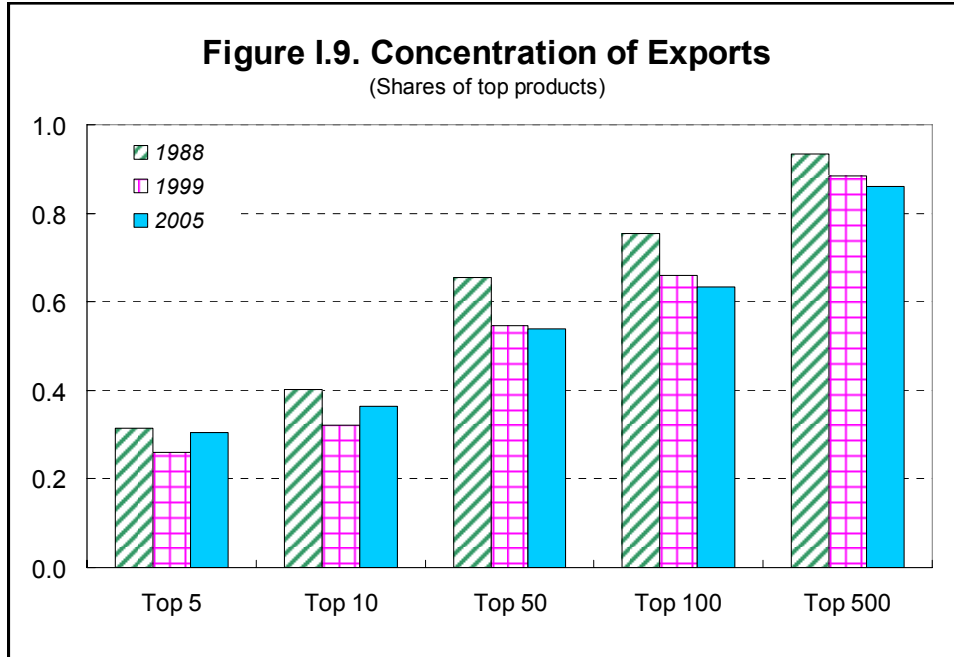
Figure I.4. Total Factor Productivity: China, India, Japan, and the United States
(1992=100)



Source: WEO (April 2007).







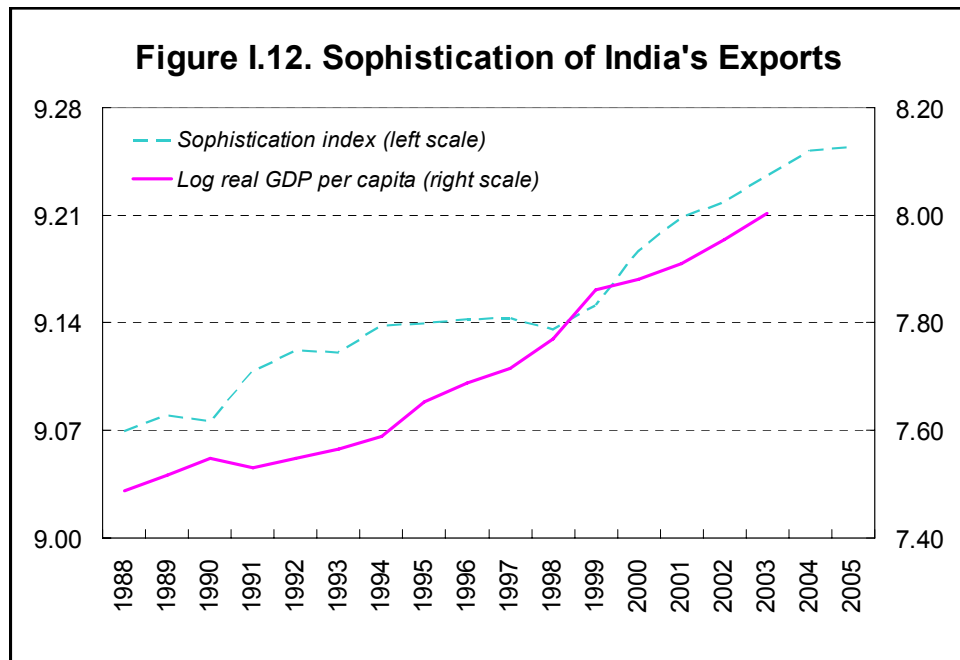
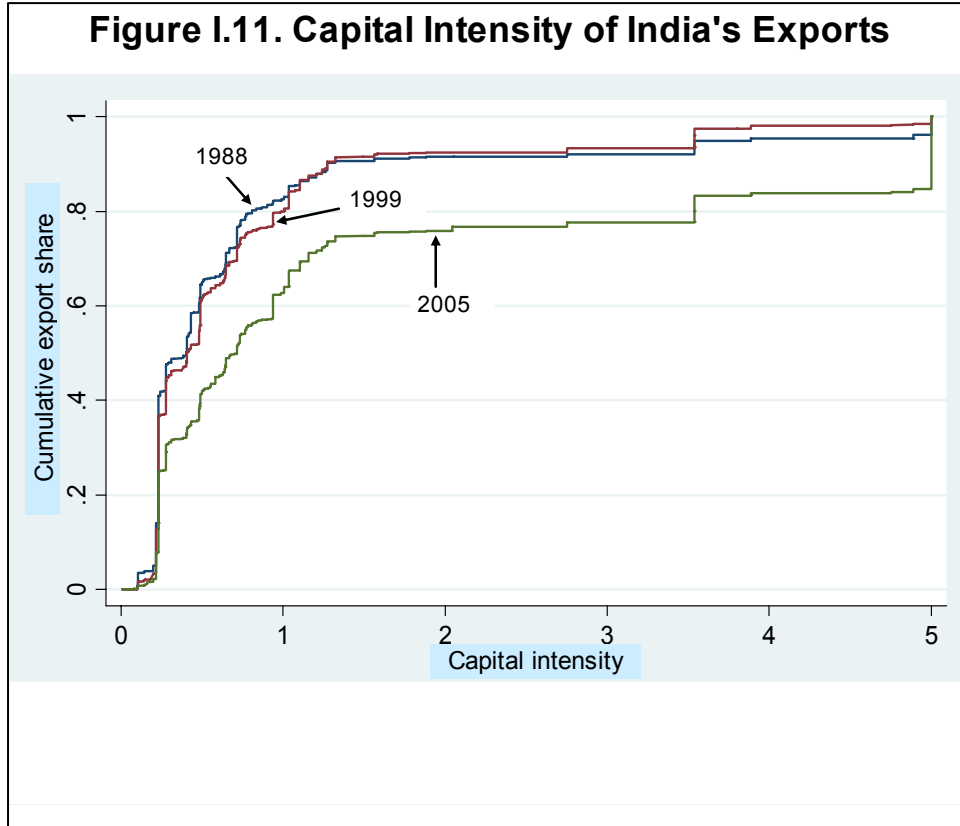
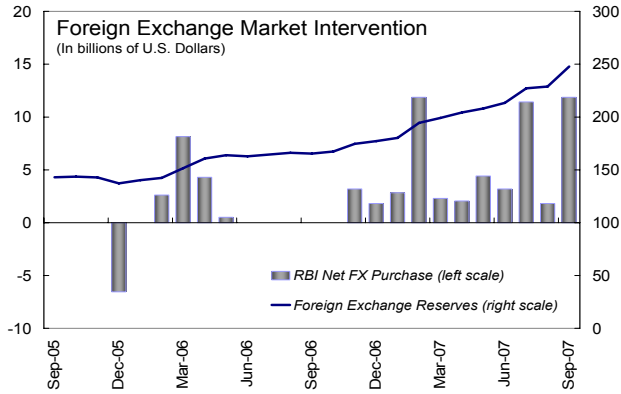
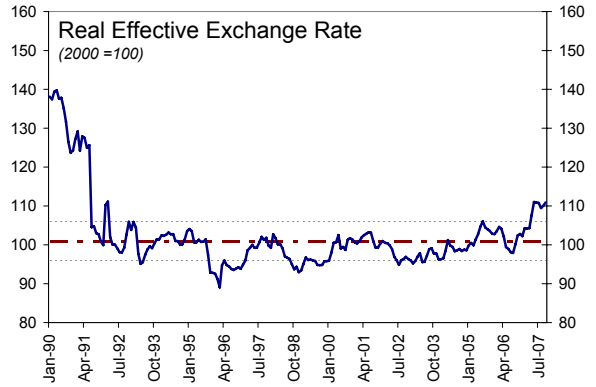


Figure I.13. India: Exchange Rate Highlights

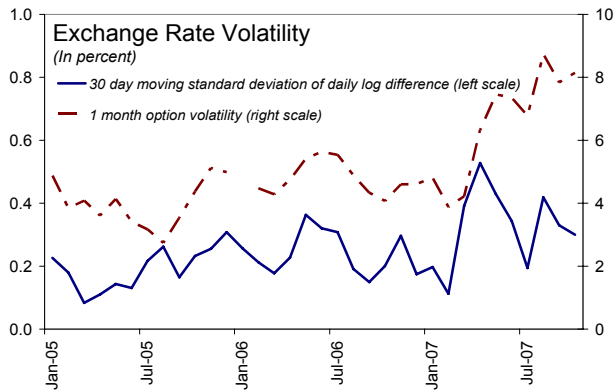
Notwithstanding intervention...



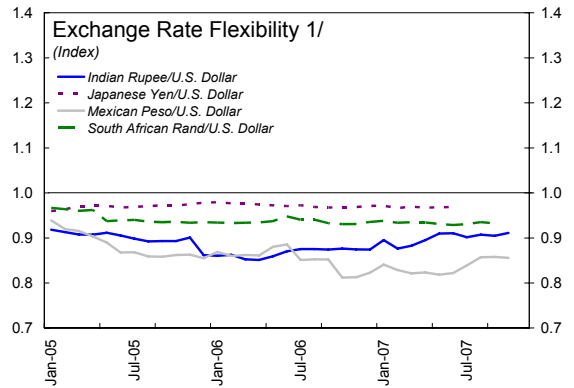
... the REER has appreciated above its recent historical range...



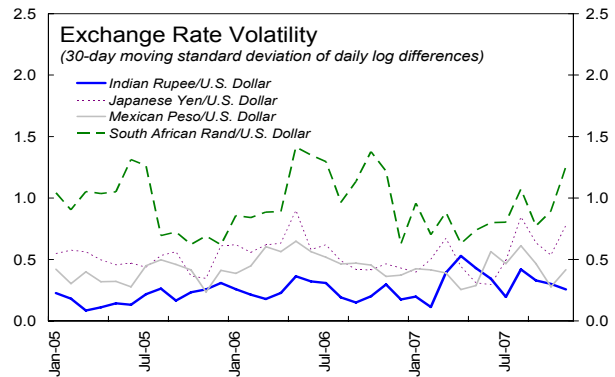
...and the rupee's volatility has remained elevated...



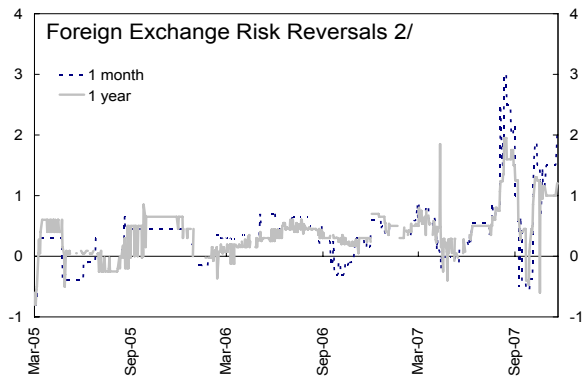
The exchange rate regime's flexibility is similar to that of other large emerging markets...



...as is volatility...



...and the option market currently prices in a higher chance of depreciation of the currency.



Sources: Data provided by the Indian authorities; CEIC Data Company Ltd; Bloomberg LP; and IMF staff estimates.

1/ The index is calculated by dividing the standard deviation of exchange rate movements by an index of exchange market pressure (the sum of exchange rate volatility and volatility in reserves, normalized by lagged base money). It takes values from zero to one. A lower value signifies relative inflexibility, with zero indicating a peg or a high commitment to inflation targeting.

2/ Positive number implies markets assigning a greater probability (or premium) to INR depreciating than to appreciating against U.S. dollar.

Table I.1. Asia: Real Effective Exchange Rates and Export Performance (Annual percent change)								
	2004		2005		2006		Period Average	
	REER	Exports 1/	REER	Exports 1/	REER	Exports 1/	REER	Exports 1/
China	-2.6	35.4	-0.2	28.5	2.1	27.1	-0.3	30.3
India	1.7	31.9	4.2	29.9	-1.3	21.2	1.5	27.7
Indonesia	-4.8	17.3	-1.3	19.7	17.1	33.0	3.7	23.3
Korea	1.8	30.9	12.1	12.1	7.4	16.2	7.1	19.7
Malaysia	-4.4	20.5	0.3	11.4	4.0	14.0	0.0	15.3
Philippines	-3.2	9.5	7.0	3.9	11.1	14.0	5.0	9.1
Thailand	-0.5	19.8	1.9	14.5	8.9	18.7	3.4	17.7

Source: DGC&S, India; and IMF, *Information Notice System and Direction of Trade Statistics*.
1/ Goods export.

Table I.2. CA Norm Contributions								
	Total		Dep.	Pop	OilBal/GDP	Per Capita	Rel.	CA Lag
	FB/GDP	Ratio	Growth			Income		
India	-3.1	-0.7	2	-1.2	-0.6	-0.6	-1.7	0.1

Table I.3. MB Approach				
Elasticities	CA/GDP norm	Change in REER from reference Period to Projection Date	Projected Medium-term CA/GDP at Reference Period Exchange Rate	Multilaterally Consistent RER gap
<i>(In percent, except for elasticity)</i>				
0.19	-3.1	-1.4	-2.7	-3

Table I.4. Correlation between Intervention and Rupee/Dollar Rate				
	2000–2007	2000–2002	2003–2004	2005–2007
Level ¹	-0.21*	0.46	-0.35	-0.22
Change ²	-0.31*	-0.48*	-0.45*	-0.17
Volatility ³	0.05	-0.39*	-0.11	-0.09

* indicates significance at the 95 percent confidence level.
Source: "Sterilized Intervention in Emerging Asia: Is It Effective?," Chapter III in *Asia Pacific Regional Economic Outlook*, Asia and Pacific Department, International Monetary Fund, October 2007

¹A positive number indicates that intervention is associated with a more depreciated rupee.
²A positive number indicates that intervention is associated with slower rupee appreciation.
³A negative number indicates that intervention is associated with lower rupee volatility.

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II. CHALLENGES TO MONETARY POLICY FROM FINANCIAL GLOBALIZATION: THE CASE OF INDIA¹

A. Introduction

1. **How should India adapt monetary policy to ongoing financial globalization?** This question has gained prominence with the recent surge in capital inflows. As a result of that surge, India has experienced volatile monetary conditions, with overnight rates swinging from over 70 percent to under 0.5 percent in early 2007; rising exchange rate volatility; exchange rate appreciation; and burgeoning domestic liquidity. Efforts to manage inflows have brought out the classic tensions—the impossible trinity—among exchange rate stability, domestic monetary independence, and financial openness. So far policy has chosen from an eclectic mix of tools: some measures liberalizing inflows and others tightening; liberalizing outflows; allowing greater exchange rate flexibility, while undertaking partially sterilized intervention to smooth volatility; and hiking policy interest rates and the reserve ratio.
2. **Looking to the experiences of the emerging and developed countries that are more financially globalized, the paper asks, what can India expect in terms of the evolution of its own monetary conditions as financial globalization proceeds?** And how would the monetary framework need to evolve as India becomes still more integrated with the global financial system?
3. **To briefly summarize the conclusions, this chapter finds that, although the most financially globalized countries tend to experience more volatile capital flows, they do not necessarily experience more volatility in monetary conditions, monetary aggregates or exchange rates.** This suggests that the most globalized countries have adapted their policy regimes to keep capital flows from creating volatility in monetary conditions. In particular, as capital account restrictions are lifted, countries appear to shift to more flexible exchange rate regimes. However, we find no clear association between the policy regime at a broad level—e.g., inflation targeting versus more eclectic monetary regimes, exchange rate pegs versus floats—and the degree of stability in monetary conditions. While countries with independent floats and inflation targeting seem to experience less exchange market pressure, the result does not hold if a broader index of monetary conditions (including domestic interest rate changes) is used. We then explore some subtler elements of the monetary framework, namely operations and communications, that may hold the key to effective monetary management of financial globalization.
4. **The chapter proceeds as follows. Section B compares the degree of financial openness in India to a range of other countries, and also looks at how its openness is**

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changing recently. Section C examines how financial globalization tends to affect the monetary environment. Section D draws some policy implications, and Section E concludes.

B. How Financially Globalized is India?

5. **This section documents the major trends in the evolution of the international financial integration of India.** To do so, we first study the international balance sheet of India. We then examine flow data, including to assess the pace at which India is integrating. For a third perspective, we also examine measures of market depth, e.g. foreign exchange turnover, and market pressure.

International Comparison

6. **The sample covers a broad range of industrialized and emerging countries, including a few financial centers** (e.g., Hong Kong). All variables used as proxies for financial openness are normalized by GDP, as the impact of openness on monetary conditions is likely to depend on the size of capital flows in relation to GDP (see the Data Appendix for details).

7. **India is not very financially globalized, in a stock sense, but is fast globalizing by opening its economy to capital inflows.** The total of foreign assets and liabilities is the lowest in the sample (Figure II.1). Using a flow-based measure (the sum of capital inflows and outflows, in absolute terms) yields broadly the same result. This is because capital outflows in India have averaged less than 0.4 percent of GDP since the beginning of the decade (the lowest value in the sample). In contrast, capital inflows are now close to 5 percent of GDP, comparable to the levels seen in other large emerging countries (Brazil, China), although well below that in the major financial centers.

8. **India's low financial openness in part reflects the restrictions in place on cross-border capital transactions.** (Figure II.2 and Box II.1).² The top panel of Figure II.2 shows a summary measure of capital account restrictions (the Abiad-Detragiache-Tressel index). By this measure, India's capital account is more open than those of China, Thailand, or Brazil, but less so than those of Korea, Turkey, or Mexico. The bottom panel uses a broader liberalization measure (the Chinn-Ito index) which incorporates information on current account restrictions, presence of multiple exchange rates, and requirement of the surrender of export proceeds.³ On this measure, India is one of the least open in the sample, along with

² In Figure II. 2 and successive charts that show countries on the x-axis, countries are ranked from highest to lowest in terms of their financial openness, measured as gross assets plus liabilities over GDP.

³ See Chinn and Ito (2007) for details on the calculation of the index.

China, Turkey, and South Africa. However, Kramer and Kohli (2007) cite evidence that India is more financially open on a *de-facto* basis than is suggested by *de jure* regulations.⁴

9. **Being a relatively less open country results in India experiencing relatively low volatility in capital flows, similar to other less open emerging countries.** In contrast, the financial centers in the sample (Hong Kong, United Kingdom, Singapore) are characterized by both high and volatile capital flows (Figure II.3).

India's Globalization Over Time

10. **Figure II.4 shows that total net capital flows have risen about 6-fold since the first quarter of 2004.** This partly reflects the pick-up in foreign institutional investment (FII) inflows since 2003/04. Since 2004/05, the volatility of FII inflows—as measured by the 12 month moving standard deviation in monthly inflows—has also risen notably. The past two years have seen other types of inflows, such as external commercial borrowings (ECBs), accelerating as well, liberalization of ECB restrictions allowed Indian companies greater access to foreign financing. More recently, FDI inflows have also surged.

11. **Another indicator of India's growing financial integration is the depth of the foreign exchange market.** Turnover has risen over time, especially since the second half of 2002, and this trend has been accompanied by an increase in volatility (Figure II.5a). Data from the BIS Triennial Survey, which includes forwards and swaps, show an even more dramatic rise in daily turnover from \$7 billion to \$34 billion since 2004 (Kramer and Kohli, 2007).

12. **At the same time, there has been a marked increase in the volatility of daily movements in the rupee vis-à-vis the US dollar.** India's exchange rate volatility, by this measure, is now almost at par with that of Mexico (which experienced a similar average level of capital inflows to GDP during 2000–06), although still lower than that of South Africa (which experienced nearly twice as much inflows to GDP during the same period). Similarly, exchange market pressure (measured by the sum of rupee appreciation and change in foreign exchange reserves normalized by lagged reserve money) has increased (Figure II.5a). A broader market pressure index (measured by the weighted sum of foreign exchange purchases and RBI sterilization operations through overnight repos and market sterilization bonds, normalized by reserve money) shows that market pressure has risen sharply in the second half of 2007, coinciding with the surge in inflows since July and more volatile monetary conditions (measured by the past 12-month standard deviation of a broad monetary

⁴ Also, Paschira (2007) finds that India's *de-facto* openness is much higher than its *de-jure* controls would suggest.

conditions index calculated as the weighted average of domestic interest rates and real effective exchange rate movement, with weights of 0.8 and 0.2, respectively) (Figure II.5b).⁵

C. How Does Financial Globalization Affect the Monetary Environment?

13. **This section uses international comparisons to examine whether increased financial openness is associated with higher volatility in the monetary environment.** We use several indicators of the latter, including exchange rate volatility and exchange market pressure, volatility in a monetary conditions index (MCI), and volatility in reserve money.

14. **Currency market volatility appears moderate in India compared to most of the more financially open countries.** The average exchange market pressure (EMP) over 2000–06 is lower in India compared to more financially open emerging countries with managed floats like Malaysia or Russia (Figure II. 6). Exchange rate volatility has risen, as noted earlier, but remains one of the lowest in the sample. This suggests that India’s capital account restrictions help insulate it to some degree from exchange rate pressures faced by more financially open countries. That said, Figure II.7a shows that the correlation between financial openness and exchange rate volatility is weak (in fact, negative in our sample); some of the most financially globalized countries have very modest levels of exchange rate volatility (perhaps reflecting deep and liquid currency markets). The correlation between financial openness and EMP is also weak (Figure II.7b).

15. **Similar results are found examining measures of volatility in monetary conditions.** Figure II.6 shows that monetary conditions (measured by an MCI index) tend to be less volatile in India than in some of the more financially open emerging countries in our sample (South Africa, Chile, and Russia).⁶ At the same time, other financially globalized emerging countries (Thailand, Malaysia) and most of the advanced countries also exhibit low MCI volatility. In fact, the correlation of MCI volatility with financial openness in our sample is negative (Figure II.8). Using the volatility of reserve money (normalized by GDP) as an alternative measure yields similar results (Figures II.6 and II.9), showing that financial openness is not closely related to this measure of volatility.

16. **Next, we examine another dimension of financial globalization i.e., the comovement between monetary conditions in financially integrated countries.**

⁵ For the market pressure index, we also use weights of 0.8 and 0.2 for the domestic and external component, respectively. Using an alternative measure with equal weights yields qualitatively similar results (see footnote 5).

⁶ In the case of India, Kannan et al. (2006) find that the interest rate is more important than the exchange rate in influencing monetary conditions, when accounting for the credit stance. However for some countries in the sample e.g., Malaysia, the exchange rate tends to exert equal importance. We therefore also used an alternative measure of MCI with weights of 0.5 and 0.5. Our results remain qualitatively unchanged.

Specifically, we investigate how the monetary environment in the US affects the monetary environment in our sample countries. More financially open countries appear to exhibit a higher correlation of their MCI with the US MCI (Figure II.10).⁷ But the relationship is statistically weak, with significant outliers on both sides. For example, India's MCI has a coefficient of correlation of 0.7 with the US MCI.⁸ This level of correlation is comparable to that of other more financially globalized Asian countries (Thailand, Malaysia and Singapore), despite India's relatively closed capital account.

17. **The question is then how the most financially open countries design the monetary framework to maintain monetary stability in the face of greater openness, greater correlation with U.S. monetary conditions, and more volatile capital flows.** The obvious conjecture would be that a particular policy regime helps them stabilize monetary conditions in the face of more volatile flows. For example, economies that become more open to international financial markets may shift to more flexible exchange rate regimes to reduce their vulnerability to shocks (Hussain, Mody, and Rogoff, 2005). It could also be the case that one type of regime or another can successfully “import” the relative stability of U.S. monetary conditions.

18. **Empirically, do countries tend to adopt particular policy regimes as they gain greater access to international financial markets?** Using a *de jure* measure such as the Chinn-Ito index (Figure II.11a, bottom panel), there is a clear association between capital account liberalization and the choice of a flexible exchange rate regime, confirming results in Hussain, Mody and Rogoff (2005). However, using either *de jure* or flow-based measures of financial openness, we find no evidence that the more financially open countries in our sample prefer a particular type of monetary policy framework (Figure II.11a, top panel).

19. **The choice of monetary policy framework in turn seems to have little influence on the volatility in monetary conditions in our sample, when the latter is measured using MCI volatility.** Figure II.11a (top panel) shows that MCI volatility has been low in most countries in our sample (except Turkey) over 2000–06, whether they were inflation targeters, anchored monetary policy to the exchange rate or, as in India, have a multiple objective⁹ or other type of monetary policy framework in place.

20. **The choice of exchange rate regime does not seem to relate strongly either to the volatility of domestic monetary conditions.** Most countries with pegs or managed floats

⁷ However, we find that the correlation coefficient is negative (higher than 0.5) for the sub-sample of countries with lower levels of financial openness.

⁸ The Data Appendix shows the correlation coefficient between US and domestic monetary conditions and financial openness for other countries in the sample.

⁹ Including for example full employment and low exchange rate volatility, in addition to inflation.

experienced below-average MCI volatility (Figure II.11a). However, Hong Kong SAR and Russia are exceptions: both experienced above-average levels of volatility despite operating a managed float. Similarly, volatility levels for countries with flexible exchange rate regimes are broadly evenly distributed above and below the sample average.

21. **The broad policy regime choice seems to matter a bit more, when financial globalization-induced volatility is defined more narrowly as exchange market volatility** (measured using an EMP index). Figure II.11b shows that while some countries in our sample with IT regimes have experienced higher-than-average exchange rate volatility over the period 2000-06, they have intervened less and generally experienced below-average EMP. Flexible exchange rate countries exhibit a similar pattern to IT countries. However, the correlation remains weak. Several countries (including India) with non-IT regimes and managed floats (or a fixed exchange rate in the case of Hong Kong SAR) have also experienced low levels of EMP over the same period.

D. Possible Policy Responses

22. **Two trends are evident in the Indian data on financial flows and monetary conditions analyzed in the previous sections:** (1) an increase in the size and volatility of all types of inflows; and (2) a relatively high degree of co-movement in India's monetary conditions index with that of the United States, notwithstanding India's low financial openness. Both of these stylized facts are consistent with the experiences of countries in our panel.

23. **However, the data also suggest that looking across the range of countries, greater financial openness is not associated with higher volatility in monetary conditions.** This result does not seem to reflect solely the choice of a broad policy regime by countries as they become increasingly financially globalized. Our findings confirm that countries tend to shift to more flexible exchange rate regimes as capital account restrictions are lifted; we also find that IT and freely floating countries have experienced lower-than-average exchange market pressure; however, we find no strong relationship between the degree of stability in monetary conditions—using a broader MCI index—and the choice of a particular exchange rate or monetary regime.

24. **Success in maintaining monetary stability in the face of financial globalization thus must have to do with more subtle elements of the monetary framework—ones such as operations and strategy.** The next section focuses on the implications of these stylized facts for monetary operations and monetary policy strategy, drawing on other countries' experiences. While it is difficult to predict whether India will face similar difficulties, there are lessons that can be drawn from reviewing the experiences of countries that have dealt with such volatilities.

How Could Further Financial Globalization Affect Monetary Operations?

25. **Greater financial globalization has helped deepen markets, which in turn encourages and supports a convergence of monetary policy operating procedures to market-based instruments.**¹⁰ In other words, with some exceptions, the central banks may have moved away from direct quantitative interventions (using blunt instruments like the reserve ratio) that make the guiding principles and impacts of monetary policy less clear, to more forward-looking interest rate management that send clearer signals through the financial markets channel. This, together with a freer exchange rate, may allow better control of domestic monetary conditions (short-term interest rates) as countries open up financially (Stevens, 2006). In the rest of the section, we argue that, in addition to deeper markets, two elements of monetary operations—liquidity forecasting and liquidity management—are key to countries' effective monetary management of financial globalization. We also discuss countries' experiences using capital controls and other non-standard instruments.

Liquidity forecasting

26. **Financial globalization makes it more difficult to forecast capital flows, in light of rising volatility in flows** (measured by the standard deviation). Under normal conditions, central banks can detect seasonal patterns, and impose these on underlying trends in demand, to obtain a monthly forecast for net foreign exchange demand. However, strong exchange rate pressure makes it impossible to predict future purchases or sales accurately (Gray, 2007). This can result in higher exchange rate volatility in countries that use interest rates as a tactical target, or contribute to more short-term volatility in liquidity conditions in countries which target the exchange rate.¹¹ In both cases, a more open financial environment implies that central banks may need to upgrade their ability to forecast foreign exchange flows.

27. **Strong competitive economies where capital inflows are vibrant face a particular challenge for liquidity management.** The liberalization of the capital account can lead to continued inflows of foreign exchange and accumulation of net foreign assets by the central bank, even under a genuine free floating rate. In some countries, this can be consistent with an objective to build-up international reserves for precautionary motives, e.g., to reduce external vulnerability. However, the country can face a point where the cost of holding additional reserves may exceed the benefits. It may then need to adopt a policy to control

¹⁰ See International Monetary Fund (2005) and Hawkins (2005).

¹¹ If the central bank has an exchange rate target, it will have little control over foreign exchange transactions at least in the short-term (volumes will be determined by the market) and may be unable to forecast them accurately. This in turn can undermine control of the central bank over liquidity conditions. If in contrast the central bank uses a tactical interest rate target, and foreign exchange interventions are not expected to influence the exchange rate, the volume is likely to be more controllable by the central bank (see Stevens, 2006, for Australia's experience pre- and post-floating the exchange rate).

reserve accumulation. Mexico, for example, has adopted in May 2003 such a policy (see Williams, 2005, and Sidaoui, 2005).¹² The policy is automatic and aimed solely at slowing the pace of accumulation: the authorities neither adopted a target, nor defined an optimal level for foreign reserves. Each quarter, the central bank supplies back to the market in equal daily installments half of what its previous quarter purchases. Because the policy is clear and pre-announced, it does not impact the market exchange rate.¹³

Proactive liquidity management

28. **As noted earlier, a common policy response of countries facing large capital flows due to financial globalization has been to intervene in foreign exchange markets to mitigate volatility and appreciation pressures.** However, such intervention by the central bank can undermine the effectiveness of monetary policy procedures, if the resulting surplus liquidity is not actively managed. Most central banks (including India's) have now shifted to market-based instruments, or a mix of quantitative and market-based instruments to carry out their sterilization objectives. While standing facilities (SFs)—used at the initiative of individual banks—are the preferred market instrument in some countries, most central banks (including in India) now use direct open market operations (OMOs) or deposit facilities (DFs) either as their main instrument or in support of SFs and quantitative instruments (such as reserve requirements). Because OMOs/DFs are used at the initiative of the central bank, they can be calibrated in view of the central bank's liquidity forecast to support its operating target (generally a short-term interest rate, but in some cases money, or a bank reserves target, e.g., the “corto” or short position in Mexico).

29. **A key operational constraint on the conduct of monetary policy in the face of large inflows is therefore the availability of domestic sterilization debt instruments, with a broad range of maturities to allow both “fine-tuning”** (dealing with short-term volatility in liquidity conditions) and sterilization of more durable inflows. The experience of Malaysia in the early 1990s underscores the need for a large “war chest” of securities for open market operations (Box 2). In some countries, the central bank is able to use government securities as sterilization instruments, with some constraints (such as, in India, the annual ceiling on debt issuance set by the fiscal responsibility law). This option avoids the risk of segmenting the market for risk-free bonds by issuing central bank paper, resulting in distortions of the

¹² For details on operation of the policy, see:

http://www.banxico.org.mx/portalesEspecializados/tiposCambio/didactico/mecanismo_red_acum_reservas.html. Such operations should be grouped with monetary operations in the liquidity forecast (Gray, 2007).

¹³ The peso foreign market is sufficiently deep to absorb daily operations (prior to introducing the floating exchange rate, the Bank of Mexico removed all the restrictions imposed in preceding years and encouraged the development of derivatives markets. As a result, daily trading volumes increased 10-fold since 1995). In shallower markets, auctions could be conducted weekly or at a lower frequency. (Relatedly, Turkey engages in preannounced operations to augment its foreign exchange reserves; see Box II.2.)

yield curve (Saggar, 2007). However, some central banks (e.g., Mexico in 2000) eventually started issuing their own securities when it became obvious that commercial banks were holding too much long-term government paper as a result of the sterilization process (Sidaoui, 2005).

30. As greater financial globalization puts a premium on active liquidity management by the central bank, a case can be made for shifting to a predominantly open market or “active” approach (also called “Fed” or “hands on” style). Such an approach assigns a smaller role to changes in reserve requirements and SFs, while involving frequent market operations.¹⁴ For example, in the United Kingdom, reserve holdings have become entirely voluntary (Table II.1). In countries with well developed money markets, SFs can still be operated in support of OMOs, to limit the volatility of the overnight inter-bank rate and provide a “safety valve” for individual banks (Hawkins, 2005). But the ability of the central bank to conduct frequent and flexible OMOs will ultimately determine the effectiveness of liquidity management, as measured by the degree of central bank control over short-term interest rates:

- First, increased market depth associated with financial globalization increases the effectiveness of OMOs, which (in a virtuous cycle) can in turn contribute to further financial market development by increasing market liquidity.
- Second, the open market approach, where the policy rate is set somewhere below the rate of the marginal (repo) lending facility and above the deposit facility (reverse repo) rate, would allow the central bank to more clearly signal its policy stance, especially when the economy faces a structural liquidity surplus (e.g., due to continuing inflows). In this case, the structural surplus of the banking system means that the overnight rate tends to hug the bottom of the policy corridor, weakening the transmission of policy rate changes to other market rates. In India for example, notwithstanding three consecutive 25 bps hikes in the repo (lending rate) and four increases in the cash reserve ratio totaling 200 bps, yields on government securities have only gone up by 30-40 bps over the past year.¹⁵

31. Shifting to an open market approach would require the use of debt or deposit sterilization instruments by the central bank with a wide range of maturities (both short-term—1–2 weeks— and longer-term—91-day to 1 year). For example, Turkey has recently

¹⁴ The frequency at which OMOs are conducted can vary from daily (Monetary Authority of Singapore) to weekly (ECB and Bank of England, where the presence of SFs and full reserve averaging lessens the need for daily OMOs). See Table II.1. Central banks can also conduct exceptional fine-tuning operations in periods of financial turmoil.

¹⁵ Lending rates, as indicated by the PLR, and deposit rates have been raised, but some banks appear to be reversing this recently in the absence of further policy signals from the RBI.

moved to issue paper of maturity up to 91 days, and introduced deposit facilities to better control short-term liquidity (Box II.3). The RBI already uses longer-term instruments (MSBs) in addition to reserve requirements to sterilize the structural liquidity surplus. However, so far, it has relied on its overnight standing operations through the Liquidity Adjustment Facility to curb short-term volatility in liquidity conditions. Completing the shift to an open market approach in the context of India would involve the use of short-term instruments (through the introduction of regular deposit auctions or the issuance of government securities with 1–2 week maturities) to conduct fine-tuning operations, in addition to regular issuance of long-term OMOs.

32. **Foreign currency swaps are other instruments that central banks can use to sterilize the liquidity impact of their foreign exchange intervention.**¹⁶ However, they do not promote the development of capital markets in the same way as central bank participation in the bond or money markets. Moreover, their cost should be identical to that of OMOs using central bank paper if conducted at market rates.

33. **Empirically, Table II.1 confirms that the most financially globalized countries in our sample tend to have an “active” approach, involving frequent and flexible use of OMOs** (for example, weekly repos, circa 1-week maturity, in the UK, combined with overnight fine-tuning operations, and longer-term monthly repos). Most also operate SFs, in support of OMOs. India’s recent move to step-up the frequency of OMOs suggests that the RBI is increasingly moving toward an “active” approach to liquidity management (in line with the policy statements issued since late 2006).

Other measures: capital controls and liberalization of outflows

34. **As foreign exchange market interventions can become costly and may only be effective in the short-term (see Edison, et al., 2007), some central banks have also applied non-standard instruments to manage inflows and/or moderate the pace of reserve accumulation.** India, for instance, recently imposed restrictions on ECBs and issuance of offshore equity derivatives. Other countries have also adopted different capital control policies on limiting inflows. Malaysia in 1994 imposed temporary controls on short-term inflows (Box 2). Thailand in late 2006 imposed an unremunerated reserve requirement to fend off speculative inflows.

35. **In some cases, controls were generally subsequently relaxed, and accompanied by measures to further liberalize inflows (Malaysia) and outflows (Malaysia and Thailand).** Several Asian countries (Korea, China, Taiwan) have recently raised the limits on national pension funds’ and insurers’ investments abroad, while others have provided greater

¹⁶ FX swaps are used by a number of central banks and should not affect the underlying exposure of the market to foreign exchange. They should therefore be grouped with monetary operations in the liquidity forecast (Gray, 2007).

flexibility to licensed onshore banks to undertake foreign currency business (Malaysia) and allowed residents to increase foreign currency borrowing and invest more in foreign currency assets (Malaysia, Korea). Similarly, India has recently increased limits on individual, corporate, and institutional investments abroad.

36. **The response of selected European countries¹⁷ to capital inflows also involved nonstandard instruments** (Otker-Robe, et al, 2007). Between 1994–2005, these countries received gross flows averaging at about 9.6 percent of GDP. Sterilized intervention and exchange rate changes (widened exchange rate bands or switch to floating exchange rate regime) were a common response in many countries. Capital controls were also imposed on short-term inflows (Bulgaria, Hungary, Poland). In addition, Bulgaria and Czech Republic liberalized outflows.

37. **The experiences of the European countries however suggest that as countries become more integrated with international financial markets, there is little room to regulate capital flows effectively** (Cardarelli, et al., 2007, find a similar result for a wider range of countries). The most effective ways to deal with capital inflows include deepening the financial markets, strengthening financial system supervision and regulation, where needed, and improving the capacity to design and implement sound macroeconomic and financial sector policies (Otker-Robe, et al, 2007). In the following section, we discuss measures that more financially open countries have taken to upgrade their monetary policy strategy.

How Could Further Financial Globalization Affect Monetary Strategy?

Increased uncertainty

38. **Financial globalization makes it harder to read the medium-term inflation outlook due to greater exposure of asset prices to foreign shocks/spillovers, and their long-term implications for price stability.** Strategies that attribute a prominent role to the analysis of monetary aggregates are challenged by financial globalization. Cross-border financial flows (portfolio investments and mergers and acquisitions activity of non-financial corporations) for instance, are genuine elements of globalization, which can account for changes in net foreign assets and money. Despite their likely remote direct effects on consumer prices, these transactions cannot be simply be netted out when analyzing the external sources of money growth. Rather, they have to be analyzed with respect to their likely impact on residents' income and on asset prices (to assess potential wealth effects). The repercussions for price stability could take place over a number of years. This possibility implies that monetary policy in a financially globalized economy may need to place

¹⁷ Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Israel, Latvia, Lithuania, Poland, Romania, and Turkey.

increased emphasis on preserving price stability over a longer time horizon, extending beyond the medium-term. The analysis may also need to factor in the potential repercussions of developments in monetary liquidity on output volatility and price stability (Papademos, 2007).

Changes in the monetary transmission mechanism

39. **As domestic asset prices are increasingly determined by global factors, the channels of transmission of monetary policy might change as well.** In particular, domestic interest rates could be increasingly influenced by global factors. This is borne out by the evidence in our sample, which showed increasing co-movement of countries' MCI with that of the US as they became more financially globalized. This suggests that monetary policy makers must pay increased attention to conditions abroad as well as at home.

40. **Does this imply that financial globalization significantly reduces the influence of central banks on monetary conditions and thereby makes monetary policy less effective?** Even if the relative importance of the different monetary transmission channels might be affected by the ongoing financial globalization, in theory a central bank is still able to preserve price stability under an open capital account under a floating exchange rate. In fact, the Mundell-Fleming model implies that monetary policy becomes more effective under a floating exchange rate regime, the higher the degree of capital mobility (Weber, 2007); the exchange rate channel more than offsets the weakening of the interest rate channel.

41. **Central banks can also retain considerable leverage over short-term and, to a lesser extent, long-term rates even in financially integrated economies** (Bernanke, 2007). Through active liquidity management (as discussed in the previous section), the central bank can drain any surplus liquidity in the inter-bank markets to keep interest rates close to the policy rate (or within a policy corridor). This gives the central bank the ability to control to a large extent short-term nominal rates (and therefore real rates if inflation is sticky in the short-run).

42. **Central banks also retain a degree of control over long-term interest rates, through clear communication to set market expectations.** By shaping expectations about short-term nominal rates, central banks can influence long-term rates (which can be viewed as the weighted average sum of expected future short-term rates plus a term premium). If the central bank is also able to anchor inflation expectations, by employing consistent and predictable policies, this in turn gives the bank control over long-term real rates. The following section elaborates on the increased role of central banks' transparency policies and communication in helping shape markets' views and sharpen monetary policy effectiveness in a financially open economy.

Communication and transparency

43. **The increased uncertainty and the changes in monetary transmission associated with financial globalization underscore the importance of a central bank's effective and consistent communication.** Stepped-up communication with market participants is especially important when globalization implies a greater share of foreign investors that may be less well informed about domestic economic conditions—or alternatively, are used to the communication modalities used in large developed countries. Several emerging countries, sometimes prompted by a shift to an IT regime, have emphasized clear and frequent communication in the new framework, contributing to a general trend toward increased transparency (see Chapter III in the Selected Issues paper). For example, Turkey's central bank presents a quarterly analysis of risks to price stability and issues summary reports of the monetary policy committee's views on the inflation outlook within 5 days of policy meetings (Box II.3).

44. **Financial globalization can also alter the response of markets to monetary policy in unexpected ways, putting a premium on clear and frequent guidance by the central bank.** For instance, an interest reduction aimed at slowing inflows may on the contrary accelerate them if investors take it as a sign that domestically-financed investment will pick up. Similarly, greater liberalization through the easing of restriction on outflows can encourage more capital inflows, as it reduces the cost of exit. In such instances, monetary policy's ability to deal with the volatility of capital inflows depends on the central bank's credibility in guiding private-sector expectations. Moreover, policy objectives must be mutually consistent. Inconsistent objectives lead to periodic shifts in policy priorities, adding to uncertainty and noise in financial markets, undermining policy credibility, and making the process of policy formulation more susceptible to lobbying by special interests.

45. **Empirically, there is a weak positive correlation (at least in our sample) between numerical transparency measures and financial openness.** Based on the Nergiz-Eichengreen measure, transparency appears to have been a main ingredient of successful strategies adopted by some of the most financially integrated countries (United Kingdom, Euro Area). That said, while these countries (United Kingdom, Euro Area) exhibit high levels of transparency, based on these ratings, many of the emerging countries with inflation targeting regimes have achieved comparable levels of transparency (Figure II.12).¹⁸

¹⁸ Related to this, we find using a different measure of transparency (based on observance of certain principles, as defined in the IMF's *Standards and Codes Gateway*), that the overall monetary policy transparency of the least financially open countries in our sample is broadly similar (even slightly higher) than that of the most financially open countries (on average).

**Box II.1. India: Key Capital Account Restrictions
(As of end-September 2007)**

Foreign Institutional Investment in equity is restricted to approved foreign institutional investors (FIIs), up to 30 percent of capital. Investment in government and corporate debt is capped at US\$2.6 billion and US\$1.5 billion; FIIs are also restricted from buying unlisted corporate debt. There are no restrictions upon associated outflows, viz. repatriation of profits. Short-term gains (below a year) are taxed at 10 percent; longer-term gains are tax-exempt.

Foreign Direct Investment is limited at 74 percent in private banks, telecoms, satellites and atomic minerals, 51 percent in single-brand retailing, 49 percent in air transport services and investing companies in infrastructure /services, 26 percent in defense, insurance, oil refining and publishing news and current affairs and 20 percent in radio. It is prohibited in retail trading, atomic energy, lottery, gambling, real estate business, and agricultural businesses such as tea plantations. Composite caps, i.e. covering portfolio and direct investment, apply in the case of banks, telecoms and radio, while investment in insurance can only be through joint ventures. Official approval is required when the foreign investor has an existing venture in the same field.

External Commercial Borrowings (ECBs) face a minimum average maturity of 3 years (up to US\$20 million) and 5 years (US\$20–500 million); additional loans of up to US\$250 million can be raised if they have an average maturity of 10 years. Funding cost must be below Libor plus 200 basis points (3–5 years' maturity) and Libor plus 350 basis points for maturities greater than 5 years. Conversion of ECBs into equity is allowed if certain conditions are met. Capital raised abroad through global or American depository receipts is prohibited for domestic financing of investment in real estate and the stock market at home. Prepayment of ECBs is subject to a \$500 million annual limit.

Short-term external borrowing is subject to a US\$20 million ceiling applied to import-linked short-term loans, per transaction and for permissible imports. Trade-related foreign loans with 1–3 year maturity and up to US\$20 million are allowed for capital goods imports. Funding costs cannot exceed Libor plus 50 basis points for credits up to 1 year, and Libor plus 125 basis points for credits with 1–3 year maturity.

Domestic banks' investments abroad are subject to open position limits and must have a residual maturity of less than a year and at least an AA(-1) rating. They can invest non-residents non-repatriable foreign currency deposits abroad in long-term fixed income instruments (minimum AA- rating) with maturity below that underlying these deposits. Opening of offshore banking units is subject to Foreign Exchange Management Act regulations. Indian companies' investments in joint ventures and wholly owned subsidiaries abroad are capped at 400 percent of their net worth.

Portfolio investments abroad are limited to \$5 billion for all mutual funds. Individual funds can invest up to 10 percent of net assets, up to \$200 million each. Residents and corporates are limited to \$200,000 a year and 50 percent of their net worth, respectively.

Box II.2. Malaysia

Malaysia's experience illustrates the complexity of monetary management in a globalizing economy. The central bank of Malaysia has two main monetary policy objectives—sustainable growth and low inflation. Despite exiting from the peg against the U.S. dollar in July 2005, the central bank also intervenes in the foreign exchange market and has stated that exchange rate stability remains an important goal. In addition, the central bank pursues financial stability. Since the early 1990s, Malaysia has experienced bouts of capital inflows and outflows that have complicated monetary policy. Malaysia's monetary policy framework uses interest rates as the main operating target of monetary policy. Since April 2004, the Bank Negara Malaysia (BNM) has been signaling its policy stance through the Overnight Policy Rate (OPR). Market based liquidity operations are aimed at ensuring the appropriate level of liquidity that would influence the overnight interbank interest rate to move closer to OPR. In addition, Malaysia has used capital controls on inflows (1994) and outflows (1997 crisis), providing room for monetary maneuvering in spite of a fixed exchange rate regime.

Prior to the mid-1990s, the monetary policy strategy had been based on targeting monetary aggregates. During this period, the BNM influenced the day-to-day volume of liquidity in the money market, consistent with monetary targeting. Private net capital inflows of long-term capital rose from 5.7 percent of GDP in 1990 to 8.2 percent of GDP in 1993, while net short-term inflows increased from 1.2 percent of GDP to 8.9 percent during the same period.^{1/} Strong macro fundamentals and favorable interest rate differentials contributed to these large inflows. To neutralize the effects of intervention in the foreign exchange market, the central bank sterilized the domestic liquidity, first by selling government securities from its stock, and later by issuing its own paper. Apart from being costly, the sterilization operations increased domestic interest rates and continued to attract capital flows. In addition, the authorities also increased reserve requirements of banks to mop up liquidity. The fiscal stance during this period was tight. However, the real exchange rate appreciated significantly owing to higher inflation. Faced with a trade-off between keeping interest rates high to contain inflationary pressures and the need to discourage short-term inflows, the authorities imposed temporary controls on short-term inflows. This strategy seemed to have succeeded in containing short-term inflows and most of the controls were removed in 1994.

The large capital inflows in 1992–93 and their reversal in 1994 exposed the limitations of monetary targeting (that may have partly to do with instability of money demand), and resulted in a shift to interest rate targeting in the mid-1990s. However, the ability of the central bank to influence domestic interest rates, based on domestic considerations, was again tested during the Asian crisis. At that time, amidst capital outflows and excessive exchange rate volatility, the trade-off was between raising interest rates to attract capital inflows and containing the downturn. The controls imposed by the authorities during this episode were wider ranging, combining temporary controls on outflows with exchange controls.

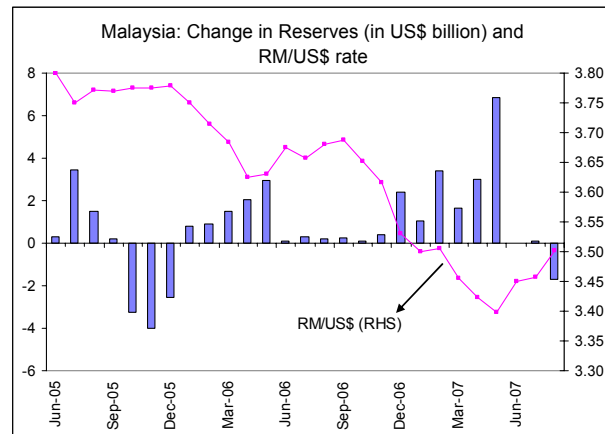
Box II.2. Malaysia, Concluded

Afterwards, the management of monetary policy focused primarily on maintaining the exchange rate peg. Liquidity management aimed at keeping interest rate at levels conducive to economic growth, exploiting the room for maneuver created by the capital controls.^{2/} Between 1998 and 2003, BNM was able to effect monetary policy based on domestic policy objectives, mainly because most of the inflows were on account of trade flows, rather than capital flows. Apart from strong fundamentals, mainly reflected in growth and inflation, many prudential and administrative controls still in place, helped in balancing capital flows and financial stability.

In the first half of 2005, capital inflows surged with the expectation of a currency revaluation, resulting in a large accumulation of reserves. From September 1998 to July 2005, the ringgit was pegged to the U.S. dollar. In July 2005, Malaysia shifted to a managed float against an undisclosed trade-weighted basket of currencies. Following the change in exchange rate regime, the ringgit was under significant downward pressure as some speculative positions were unwound. The central bank resorted to intervention to prevent ringgit depreciation. In 2006, Malaysia experienced renewed net inflows and exchange rate pressure, which the central bank countered through sterilized intervention. Subsequently, during the equity sell off in July 2006, the central bank again intervened to prevent ringgit depreciation. Since end-2005, intervention has been mainly one-sided.

The experience of Malaysia demonstrates that the commitment to exchange rate stability has posed challenges to the maintenance of low inflation in episodes of capital inflows.^{3/}

Malaysia's experience managing volatile capital flows during the 1990s offers interesting lessons. First, it demonstrates the limitations of sterilization over long periods. In the face of continuous inflows, a country can only temporarily resist appreciation pressures. The experience underscores the need for a large "war chest" of securities on the one hand, and the problem of high interest rates inducing larger capital inflows, on the other. It also shows that controls on capital inflows can be effective, although only for short periods of time.



1/ Ariyoshi, Akira and others, 2000, IMF, Occasional Papers, No. 190

2/ Cheong, Latifah 2005. "Globalization and the operation of monetary policy in Malaysia, in BIS papers No 23, Globalization and monetary policy in emerging markets, 2005

3/ Robert McCauley, Understanding monetary policy in Malaysia and Thailand: Objectives, instruments and independence, BIS, March 2006

Box II.3. Turkey

In recent years, Turkey has successfully adapted its monetary framework to the challenges posed by financial globalization. Starting earlier this decade, burgeoning capital inflows have proved challenging to macroeconomic management.^{1/} Between 2002 and 2006, the capital account balance rose from roughly zero to \$45 billion (11 percent of GDP); over the same time period, the lira appreciated in real effective terms by over 40 percent.

Increased confidence in the Turkish economy contributed to rising capital inflows and upward shifts in money demand, which complicated conduct of the monetary targeting regime that had been maintained since the abandonment of the crawling peg in February 2001. In 2006, the Central Bank of Turkey (CBT) moved from the monetary targeting regime to inflation targeting. The emphasis on price stability is explicitly enshrined in the CBT Law, which states that “the primary objective of the Bank shall be to achieve and maintain price stability” (Article 4).^{2/}

The target is medium-term in nature, with end-year targets for the CPI set jointly with the government for the coming three years. It is currently centered on a 4 percent point target with a plus and minus 2 percent tolerance band; supply-side shocks and changes in international liquidity conditions are explicitly mentioned, along with other factors, as a rationale for building in some flexibility around the target. When inflation falls outside of the tolerance band, the CBT issues an open letter to the government explaining the reasons for the breach and the measures to be taken to bring inflation back to its point target.

In addition to the formalities of inflation targeting, the CBT has also emphasized clear communication in the new framework. The CBT produces a quarterly Inflation Report with forecasts for the output gap and inflation, as well as uncertainty bands for the latter, and an analysis of risks to price stability. In addition, it issues press releases following the preannounced monthly meetings of the Monetary Policy Committee (MPC), at which decisions about policy rates (interbank and repo/reverse repo rates) are made. Summary reports discussing the Committee’s views on the inflation outlook are also issued within eight working days of the MPC’s meetings.

Monetary operations also adapted to allow for more flexible liquidity management. To ensure that the money market interest rates remain close to its benchmark borrowing rate, the CBT absorbs liquidity through its overnight deposit (at the posted benchmark rate) and repos on the Istanbul Stock Exchange (ISE). In the past, when confronted with the need to mop up “excess liquidity” from the market at times of lira weakness, the CBT has temporarily resorted to one- and two-week deposit auctions validating interest rate well above the posted benchmark (overnight) rate. In the opposite case of liquidity shortages that may push the overnight money market rate well above the benchmark rate, the CBT stands ready to supply liquidity to the market through one-week repo auctions to be conducted in the ISE at 1 percentage point above the benchmark rate target.”^{3/} To improve its ability to deal with long-lasting bulges in excess liquidity, the CBT has also recently issued central banks notes with maturities of up to 91 days.

Box II.3. Turkey, Concluded

At the same time, exchange-rate policy has become nondiscretionary. After the abandonment of the crawling peg regime and the adoption of a pure floating regime, the CBT announced in July 2001 that it would only intervene to limit excessive volatility in the exchange market.^{4/} Moreover, since April 2002, the CBT has conducted transparent and pre-announced purchase auctions, with the aim to build foreign exchange reserves for prudential reasons (reserves do not yet fully cover short-term debt on a remaining maturity basis). The government's motive to build reserves is well understood in the markets, and the small size of interventions is deliberately calibrated to avoid disturbing market prices. Foreign exchange purchases are typically sterilized, to avoid compromising the monetary stance. Indeed, high domestic interest rates have been maintained to bring inflation down to the 4 percent target, and this in turn has put upward pressure on the exchange rate.

1/ See Ali Culha, "A Structural VAR Analysis of the Determinants of Capital Flows into Turkey," Research Department Working Paper No 06/05, Central Bank of the Republic of Turkey, October 2006, for discussion of the drivers of capital inflows and their macroeconomic effects.

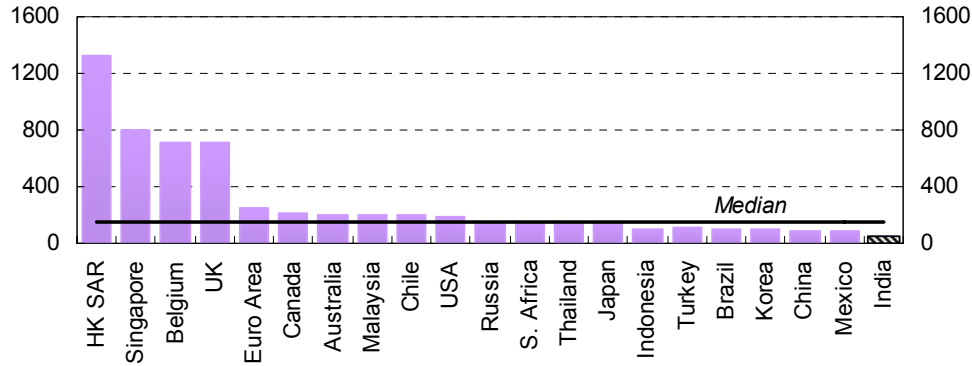
2/ The law also states that "The Bank shall, provided that it shall not be in confliction with the objective of achieving and maintaining price stability, support the growth and employment policies of the Government."

3/ See Annual Report of the Central Bank of the Republic of Turkey, 2006, page 37.

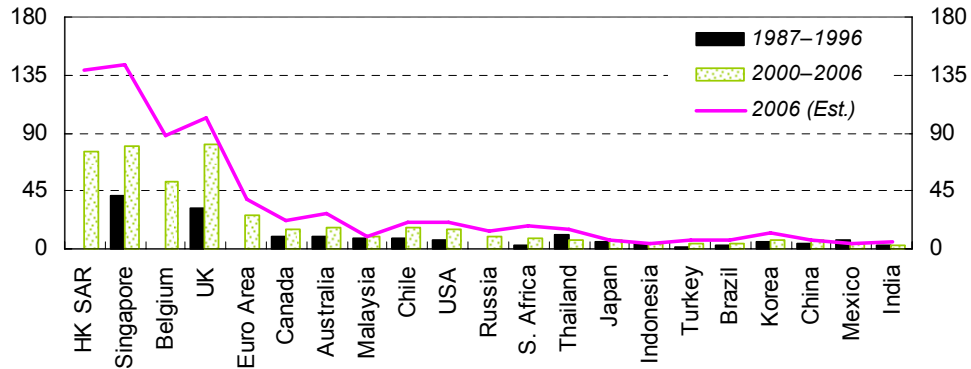
4/ See Ozge Akici, Olcay Yucel Culha, Umit Ozlale, and Gulbin Sahinbeyoglu, "Causes and Effectiveness of the Foreign Exchange Interventions for the Turkish Economy," Research Department Working Paper No 05/05, Central Bank of the Republic of Turkey, February 2005. The study found that interventions tended to dampen volatility (but did not have an effect on the trend of the exchange rate). The same result is found in Guamaras and Caracadag, "The Empirics of Foreign Exchange Intervention in Emerging Markets: The Cases of Mexico and Turkey," IMF WP/04/123, 2004

Figure II.1. Measures of Financial Openness

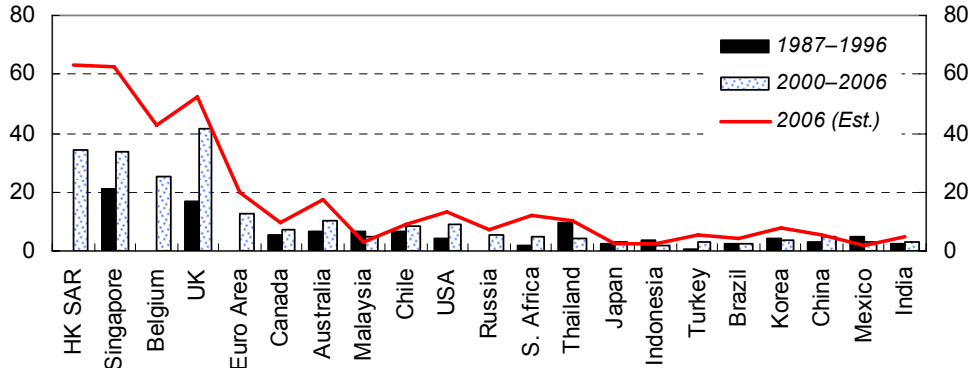
Gross Foreign Assets and Liabilities, 2000–2006 1/
(In percent of GDP, period average)



Gross Capital Flow 2/
(In percent of GDP, period average)



Capital Inflow 2/
(In percent of GDP, period average)



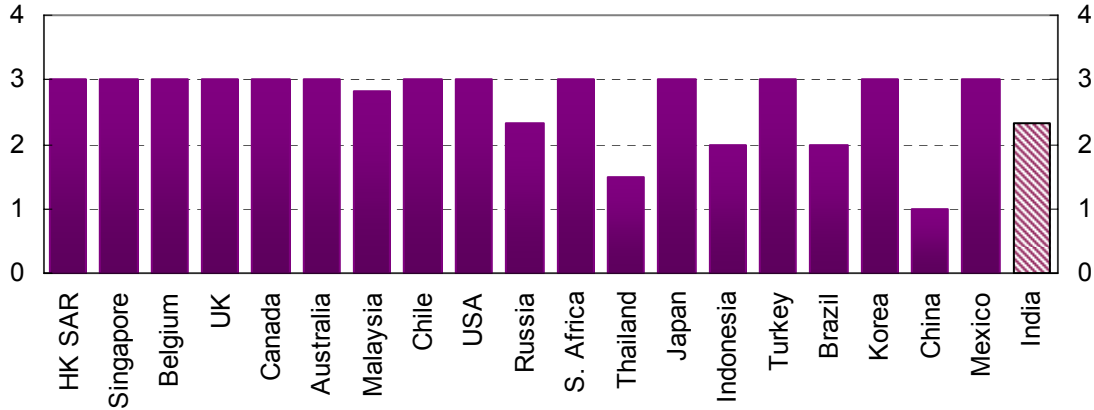
Sources: Lane, Philip R. and Gian Maria Milesi-Ferretti (2005); and IMF, *International Financial Statistics*, *World Economic Outlook* and staff calculations.

1/ Malaysia, Chile, Russia, South Africa, Turkey, Brazil and India are plotted for the period 2000–2005 and Belgium for 2002–2005.

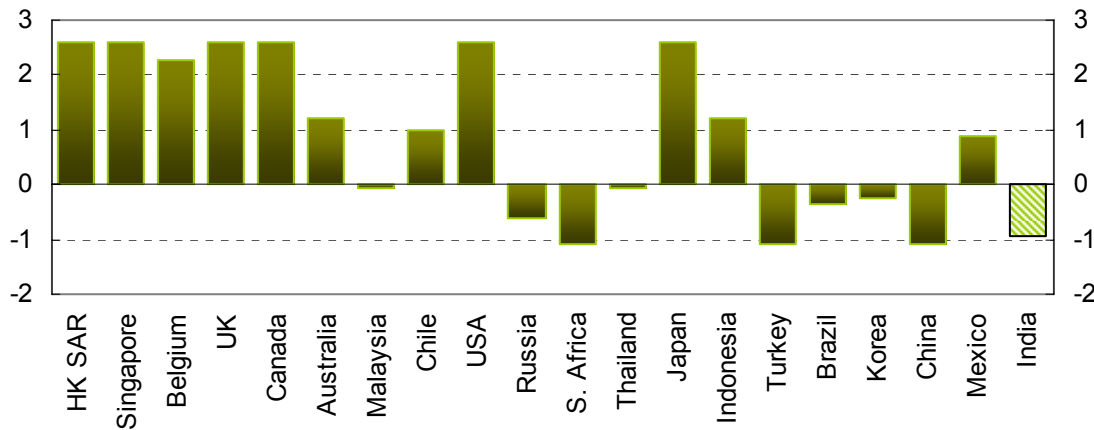
2/ HK SAR, Belgium, Euro Area and Russia are not plotted for the period of 1987–96 due to lack of sufficient data. Belgium is plotted for the period of 2002–06.

Figure II.2. Measures of Capital Account Openness, 2000–2005

The Abiad-Detragiache-Tressel Index 1/
(Period average)



The Chinn-Ito Index 2/
(Period average)

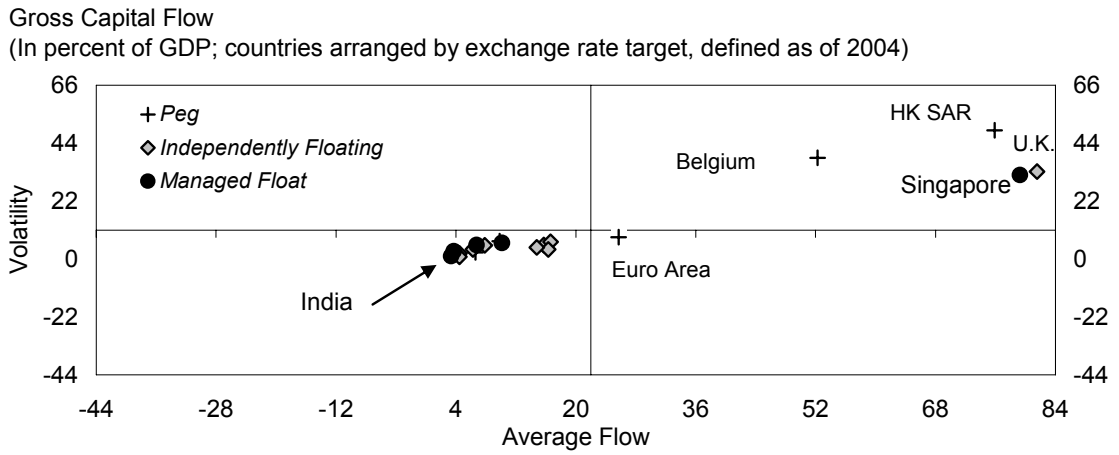
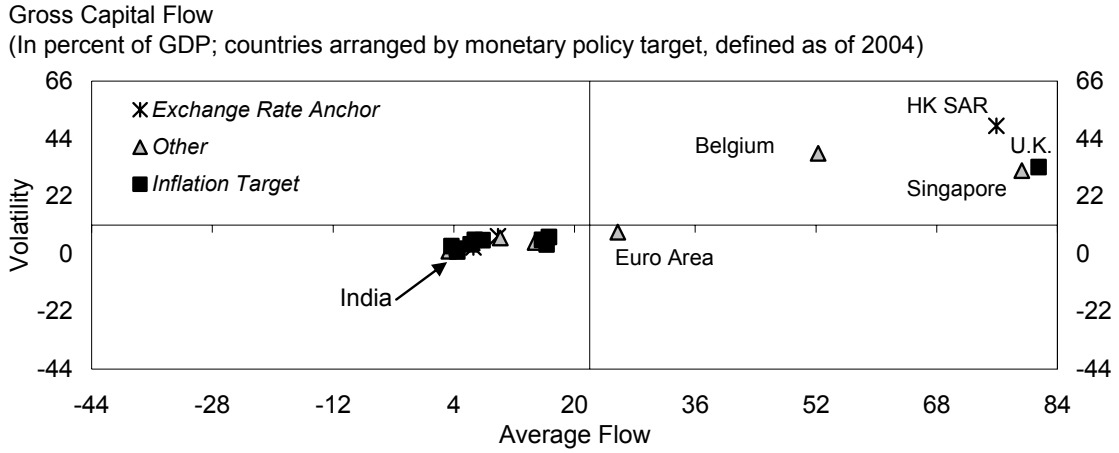


Sources: Prof. Menzie David Chinn, University of Wisconsin; Abiad, Abdul, Enrica Detragiache and Thierry Tressel (2007), *preliminary draft*; and IMF staff calculations.

1/ It can take values on a scale from zero to three, with higher score representing liberalization and lower score indicating highest degree of financial repression.

2/ A higher value indicates that a country is more open to cross-border capital transactions.

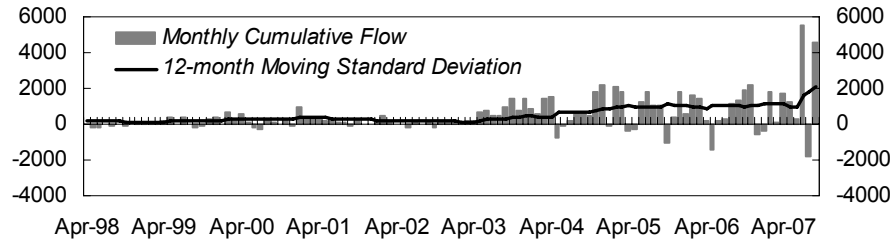
Figure II.3. Financial Openness and Policy Regime, 2000–2006



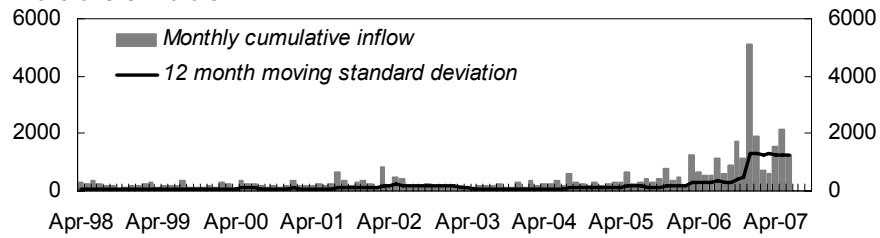
Sources: IMF, *International Financial Statistics*, *World Economic Outlook*; and staff calculations.

Figure II.4. India: Capital Flows

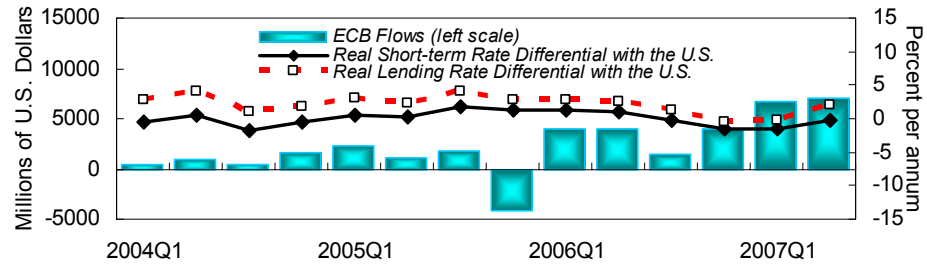
Net Foreign Institutional Investment
In millions of U.S. Dollars



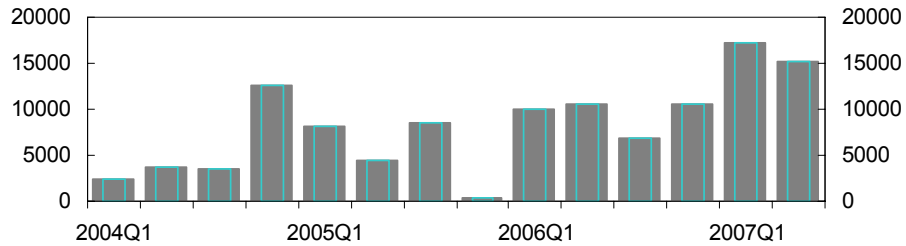
Foreign Direct Investment Inflow
In millions of U.S. Dollars



External Commercial Borrowings 1/



Net Foreign Capital Flow
In millions of U.S. Dollars

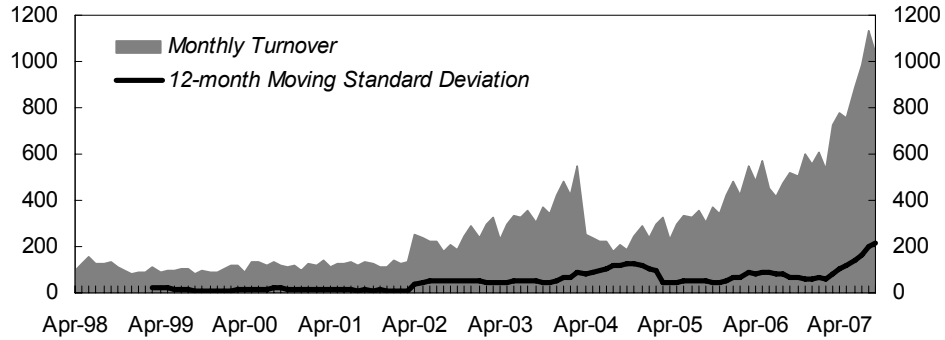


Sources: IMF, *International Financial Statistics and staff calculations*; CEIC Data Company Ltd.; and Reserve Bank of India.

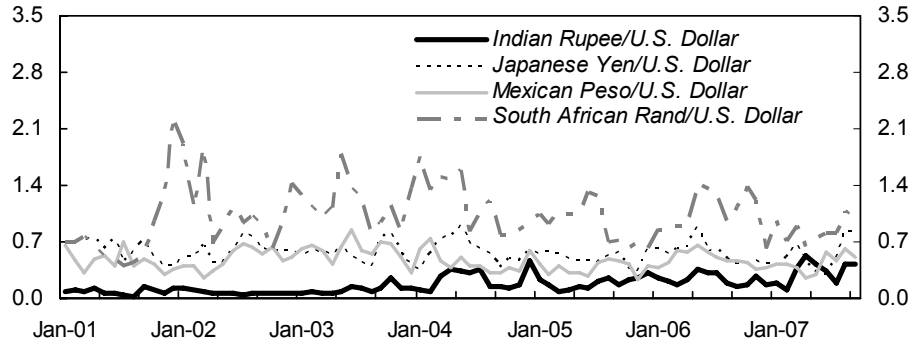
1/ Three month secondary market treasury bill yield and prime lending rate are used as the nominal rates in the calculation of real rates. Wholesale price inflation is used for India and consumer price inflation is used for the United States as a proxy for expected inflation rate.

Figure II.5a. India: Foreign Exchange Market

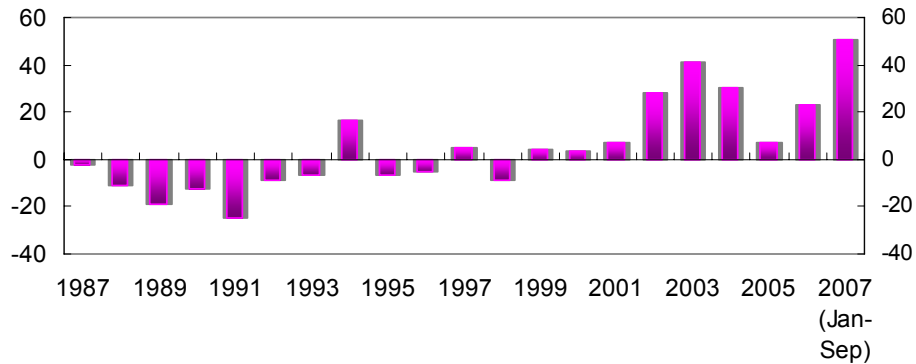
Turnover in Foreign Exchange Market
(In billions of U.S. dollars)



Exchange Rate Volatility
(30-day moving standard deviation of daily log differences)



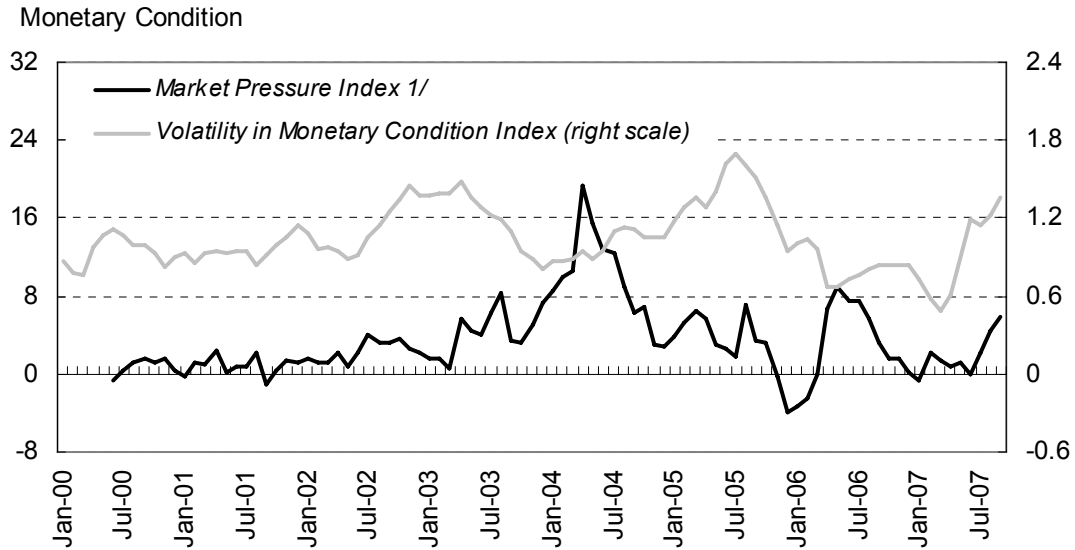
Exchange Market Pressure Index 1/



Sources: IMF, *International Financial Statistics*, *World Economic Outlook* and staff calculations; CEIC Data Company Ltd.; Bloomberg LP; and Reserve Bank of India.

1/ The index is the sum of rate of appreciation in the nominal exchange rate and accumulation in the foreign exchange reserves normalized by the reserve money stock.

Figure II.5b. India: Monetary Condition



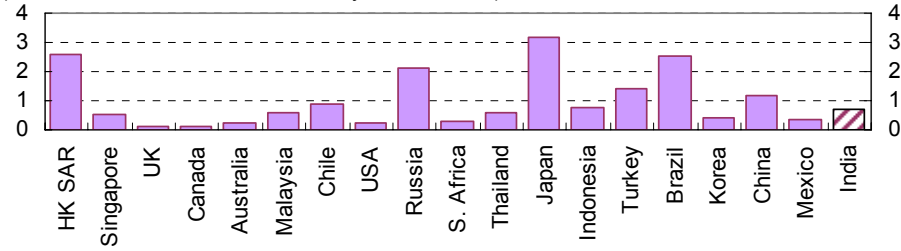
Sources: Reserve Bank of India; and IMF staff calculations.

1/ The index is a weighted sum of domestic liquidity absorption (auctions under the liquidity adjustment facility and market stabilization scheme) and foreign exchange market intervention, normalized by the reserve money. In this computation 80 percent weight was assumed for the domestic liquidity absorption activities.

Figure II.6. Measures of Volatility, 2000–2006

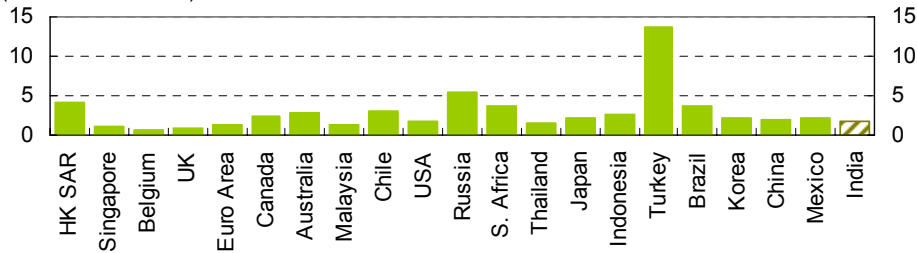
Volatility in Reserve Money

(Standard deviation of reserve money to GDP ratio)



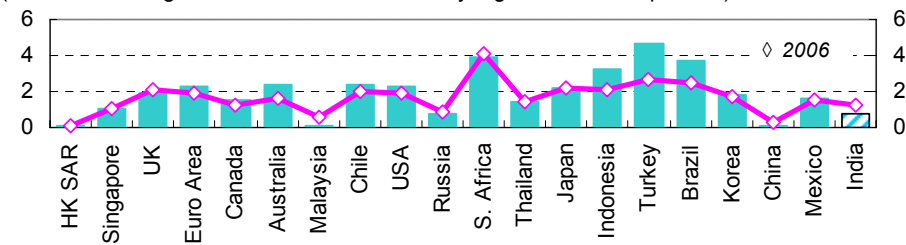
Volatility in Monetary Condition Index

(Standard deviation)



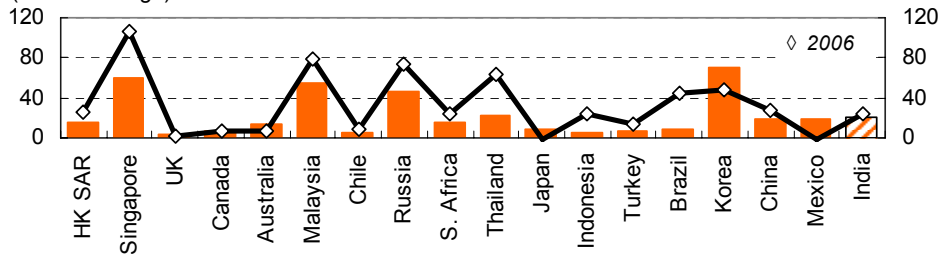
Exchange Rate Volatility 1/

(12-month moving standard deviation of monthly log differences in percent)



Exchange Market Pressure Index 2/

(Period average)

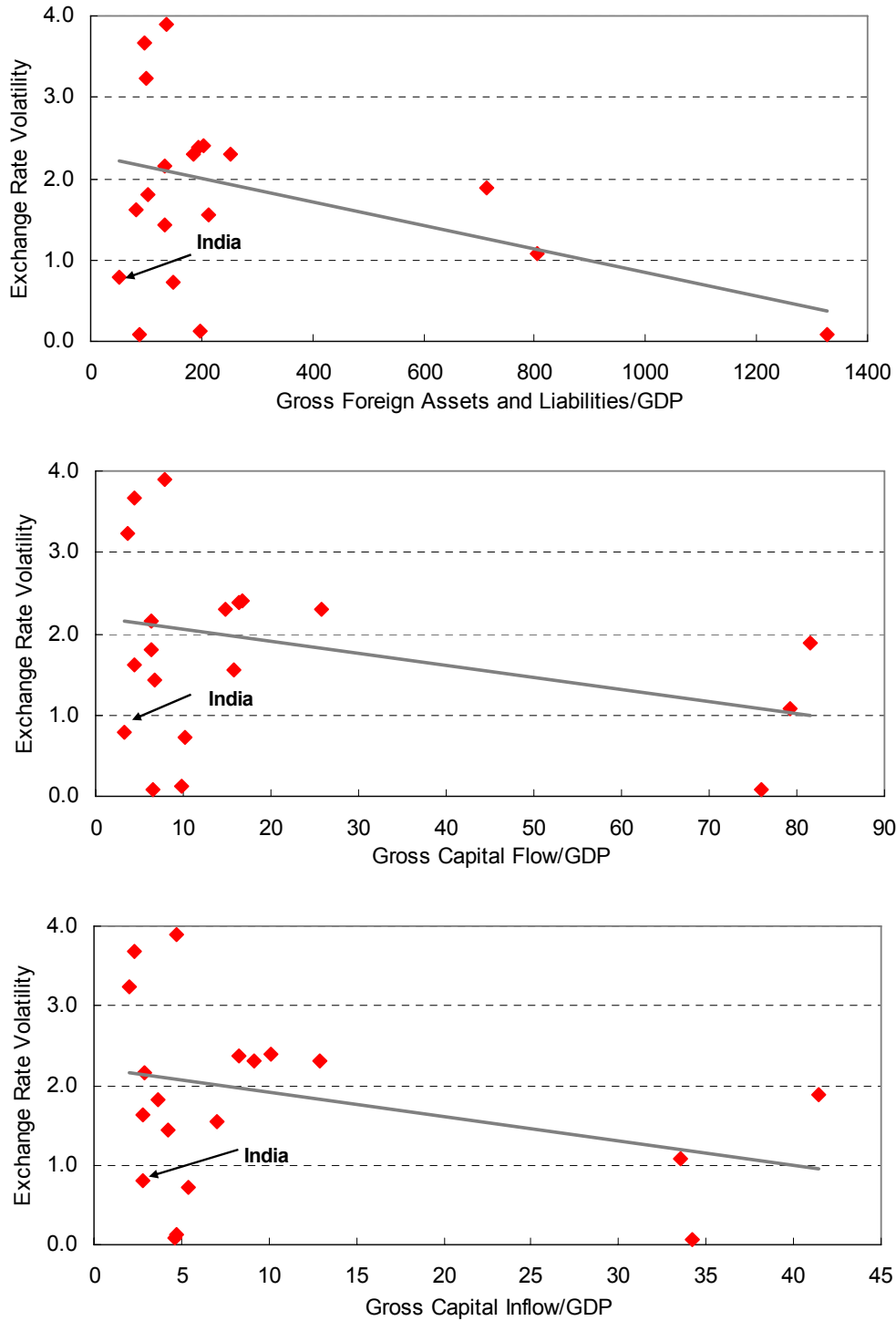


Sources: IMF, *International Financial Statistics*, *World Economic Outlook and staff calculations*; CEIC Data Company Ltd.; and Bank of England.

1/ Exchange rates measured as national currency per U.S. Dollar except for United States where it is national currency per Euro.

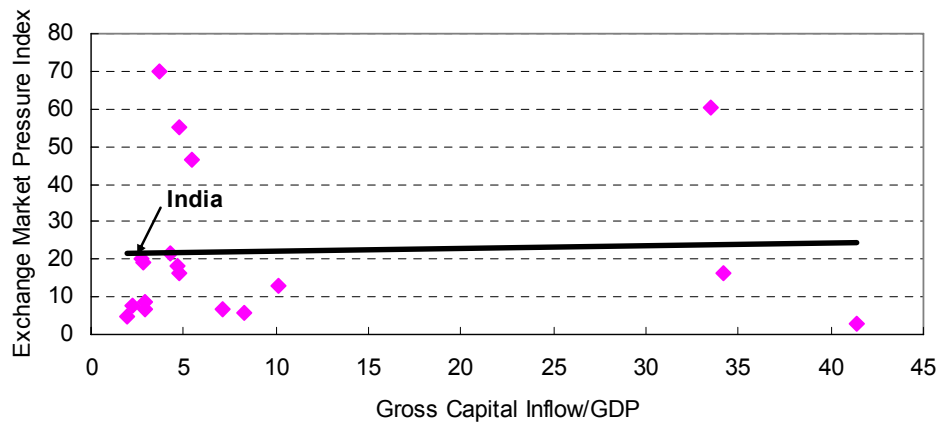
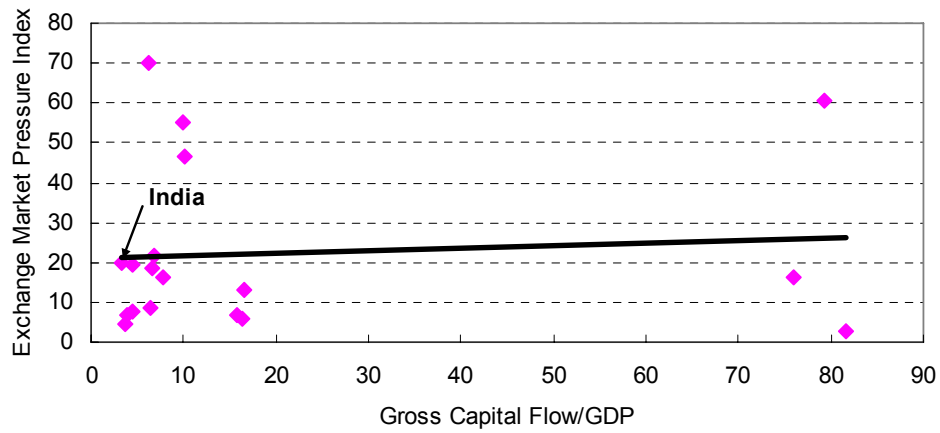
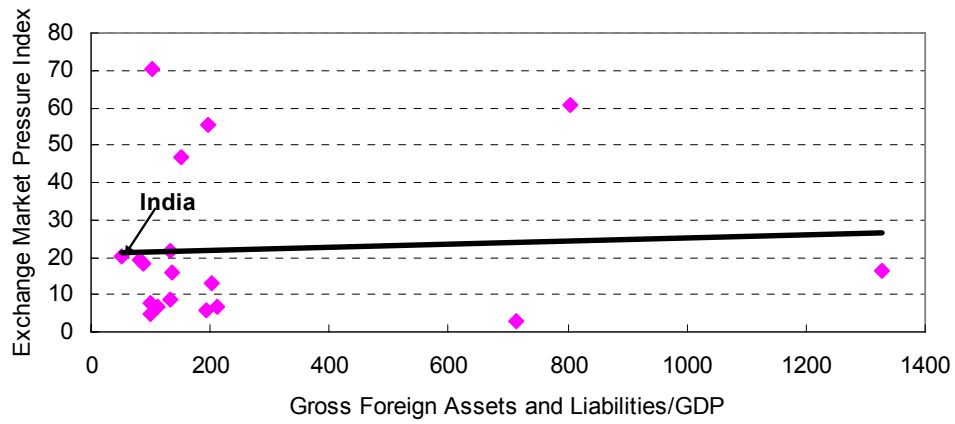
2/ The index is the sum of rate of appreciation in the nominal exchange rate and accumulation in the foreign exchange reserves normalized by the reserve money stock.

Figure II.7a. Financial Openness and Exchange Rate Volatility, 2000–2006



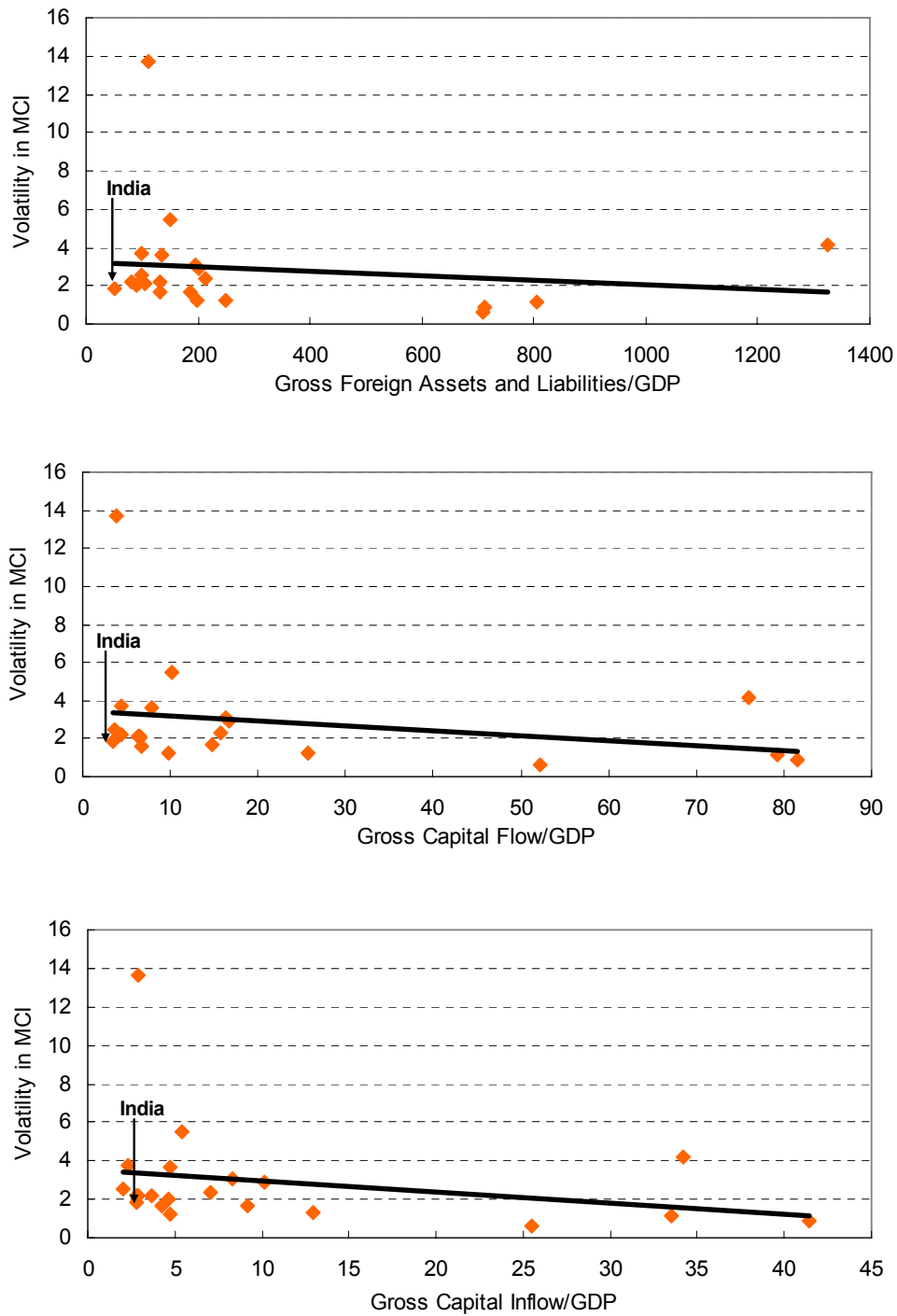
Sources: Lane, Philip R. and Gian Maria Milesi-Ferretti (2005) and IMF, *International Financial Statistics, World Economic Outlook*; and staff calculations.

Figure II.7b. Financial Openness and Exchange Market Pressure Index, 2000–2006



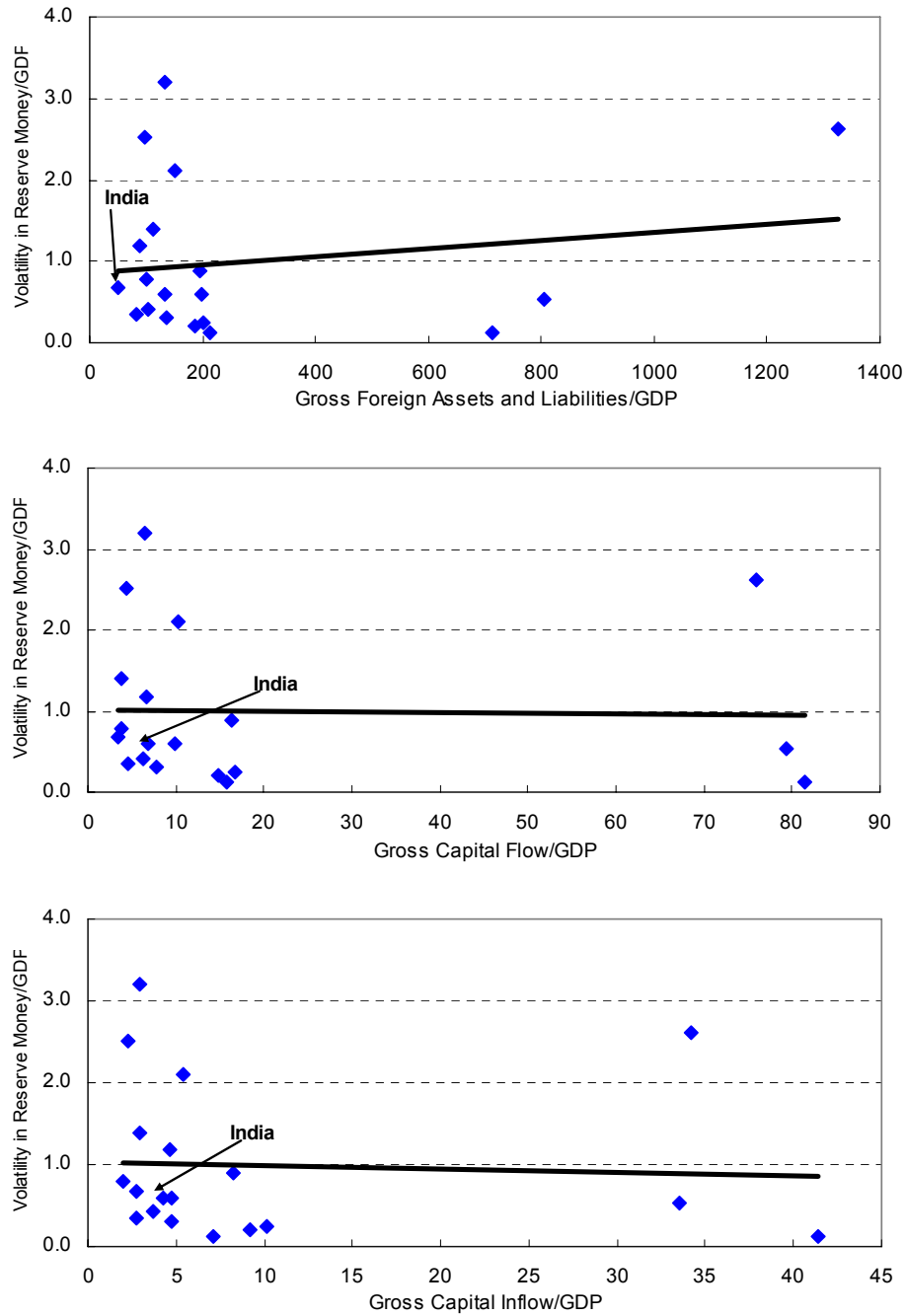
Sources: Lane, Philip R. and Gian Maria Milesi-Ferretti (2005) and IMF, *International Financial Statistics, World Economic Outlook and staff calculations*.

Figure II.8. Financial Openness and Volatility in Monetary Condition Index, 2000–2006



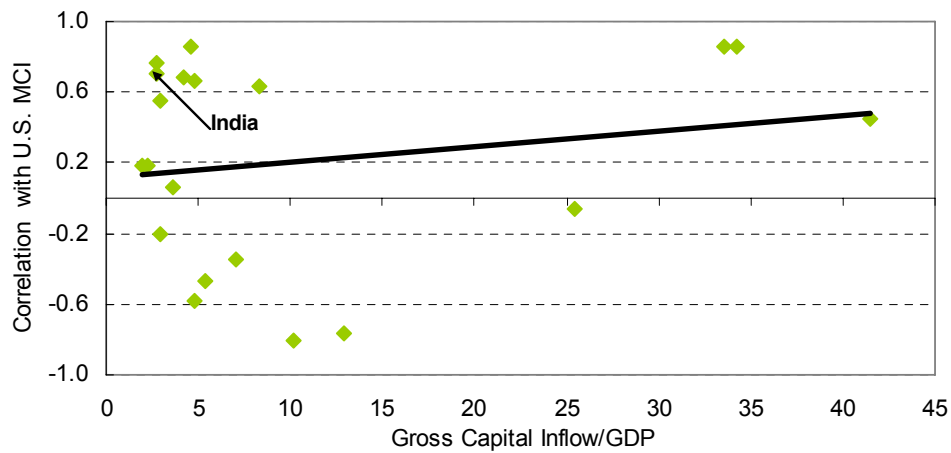
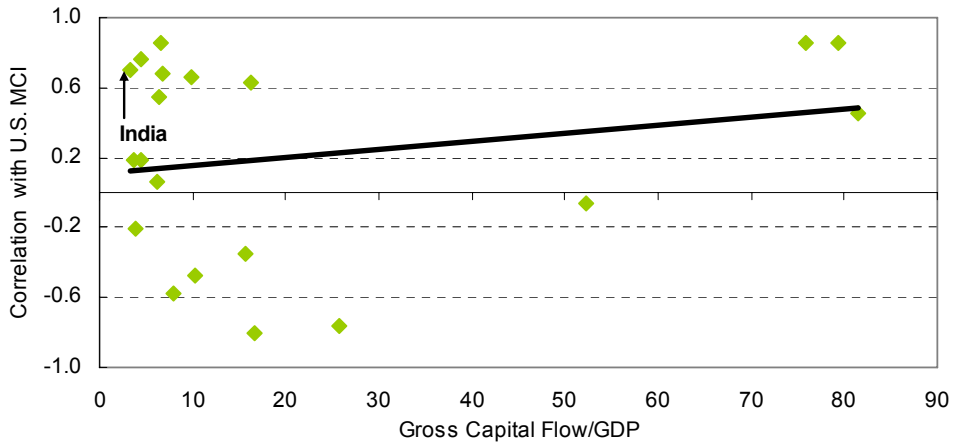
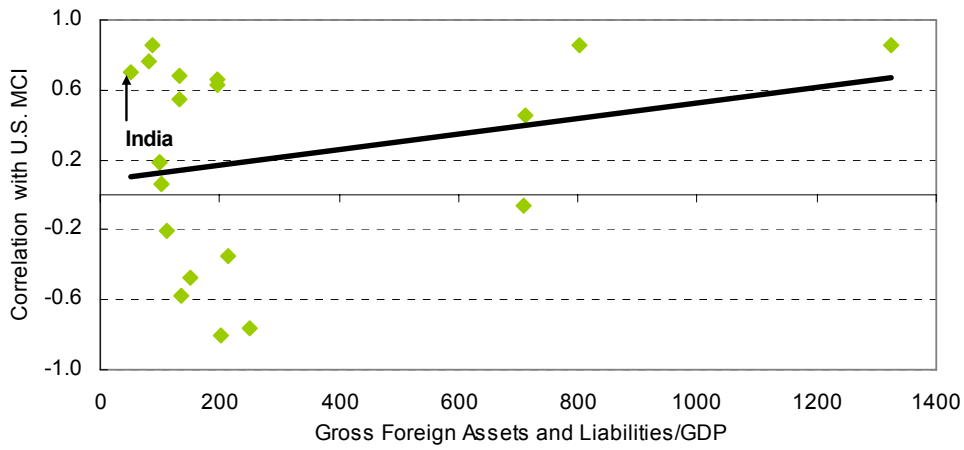
Sources: Lane, Philip R. and Gian Maria Milesi-Ferretti (2005) and IMF, *International Financial Statistics, World Economic Outlook*; and staff calculations.

Figure II.9. Financial Openness and Volatility in Reserve Money, 2000–2006



Sources: Lane, Philip R. and Gian Maria Milesi-Ferretti (2005) and IMF, *International Financial Statistics, World Economic Outlook*; and staff calculations.

Figure II.10. Financial Openness and Correlation with U.S. Monetary Condition Index, 2000–2006

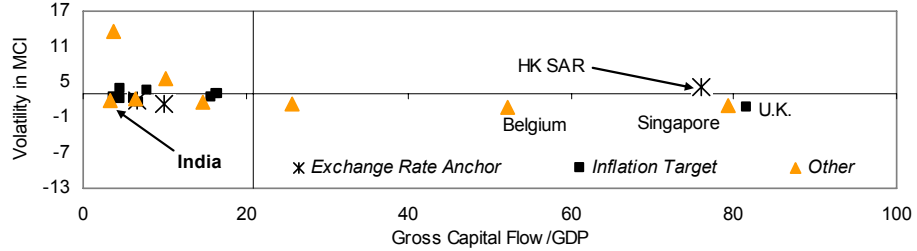


Sources: Lane, Philip R. and Gian Maria Milesi-Ferretti (2005) and IMF, *International Financial Statistics, World Economic Outlook*; and staff calculations.

Figure II.11a. Policy Regime, Financial Openness, and Volatility in Monetary Condition Index, 2000–2006

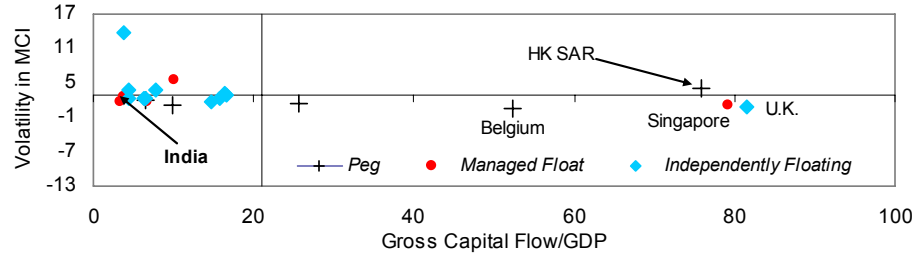
Monetary Condition Index

(Countries arranged by monetary policy target, defined as of 2004)



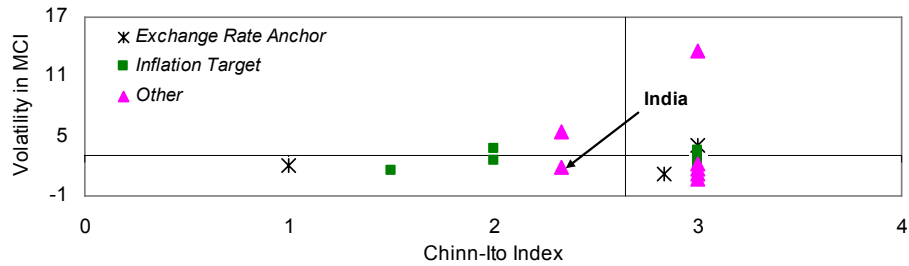
Monetary Condition Index

(Countries arranged by exchange rate target, defined as of 2004)



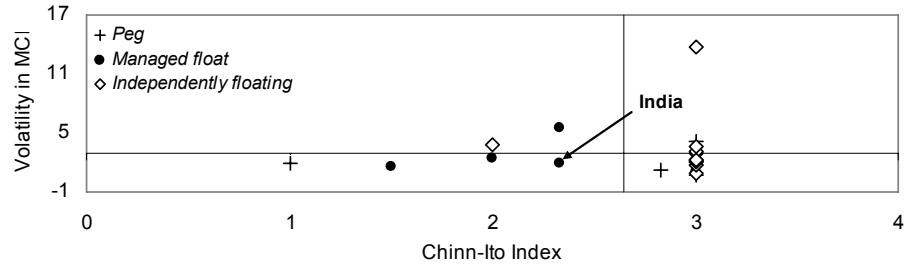
Monetary Condition Index

(Countries arranged by monetary policy target, defined as of 2004)



Monetary Condition Index

(Countries arranged by exchange rate target, defined as of 2004)

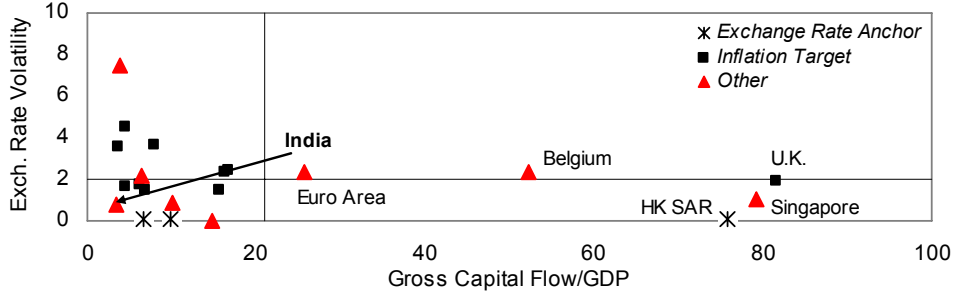


Sources: IMF, *International Financial Statistics*, *World Economic Outlook* and staff calculations; and Prof. Menzie David Chinn, University of Wisconsin.

Figure II.11b. Policy Regime and Foreign Exchange Market, 2000–2006

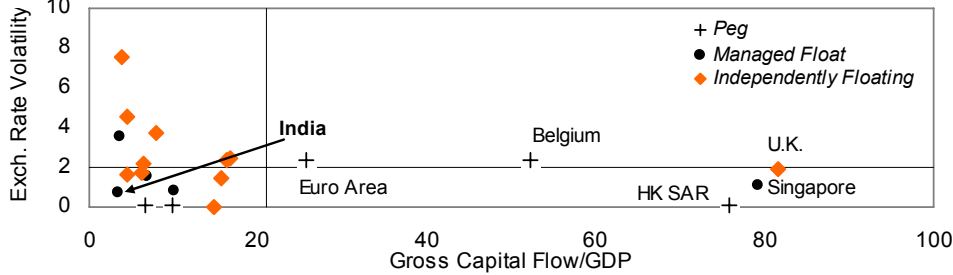
Exchange Rate Volatility

(Countries arranged by Monetary Policy Target, defined as of 2004)



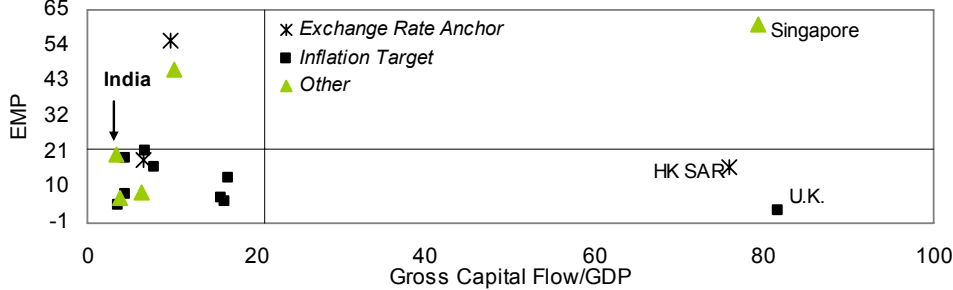
Exchange Rate Volatility

(Countries arranged by Exchange Rate Target, defined as of 2004)



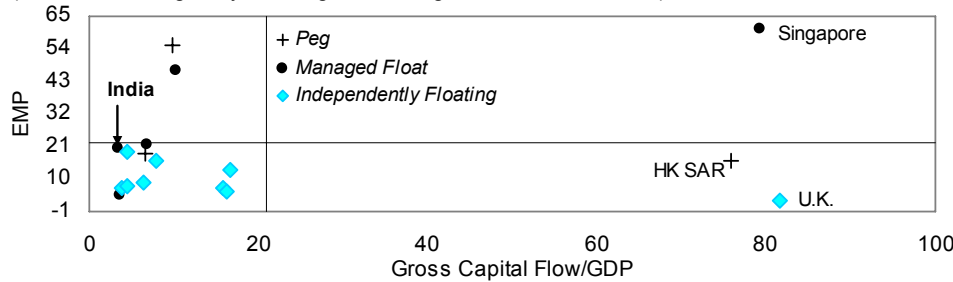
Exchange Market Pressure Index

(Countries arranged by Monetary Policy Target, defined as of 2004)



Exchange Market Pressure Index

(Countries arranged by Exchange Rate Target, defined as of 2004)

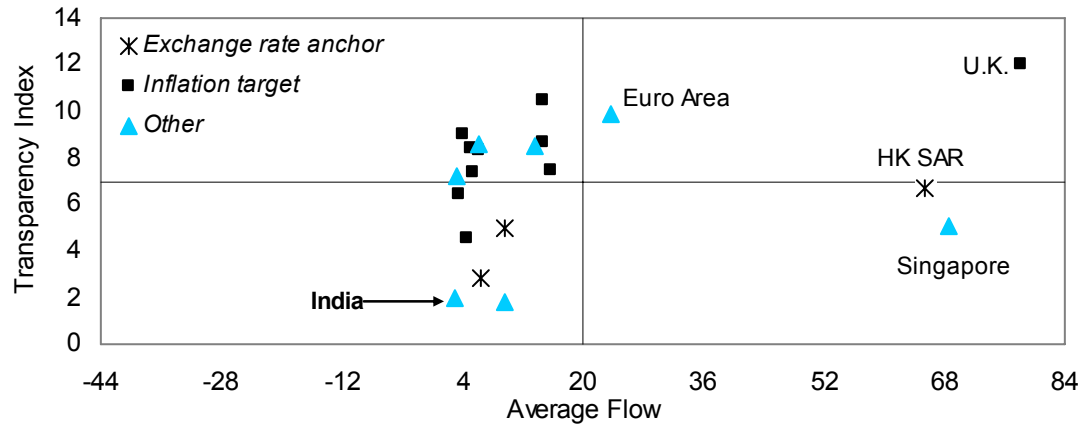


Sources: IMF, *International Financial Statistics*, *World Economic Outlook*; and staff calculations.

Figure II.12. Capital Flow and Central Bank Transparency, 2000–2005 1/

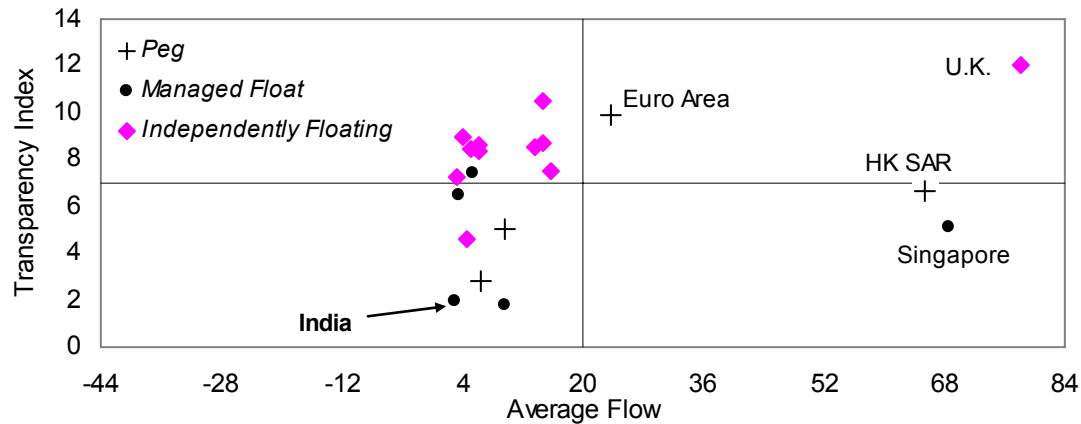
Gross Capital Flow

(In percent of GDP, countries arranged by monetary policy target defined as of 2004)



Gross Capital Flow

(In percent of GDP, countries arranged by exchange rate target defined as of 2004)



Sources: IMF, *International Financial Statistics*, *World Economic Review* and staff calculations; and Dincer, N. Nergiz and Barry Eichengreen (2007): "Central Bank Transparency: *Where, Why and with What Effects?*", NBER, *Working Paper 13003*, March 2007.

1/ A higher value indicates more transparent central bank.

	Table II.1. Monetary Instruments in the Most Financially Globalized Countries
HK SAR	<p>Sales and purchases of Hong Kong dollars for US dollars when the HK\$/US\$ exchange rate reaches the weak (strong) side convertibility undertaking, respectively, under the Linked Exchange Rate System to prevent the HK\$ from moving outside the trading band. The weak (strong) side convertibility undertaking is 7.85 (7.75) HK\$/US\$.</p> <p>Discount Window: Banks can borrow Hong Kong dollar funds overnight through repurchase agreements using Exchange Fund paper as collateral. The discount rate on the first half of the bank's holdings of the Exchange Fund paper is the maximum of 150 bps over the US Federal Funds rate target and the average five-day moving average of the overnight and one-month HIBOR rates. The rate on the remaining Exchange Fund paper is the maximum of 500 bps above this rate, and the daily overnight HIBOR rate.</p>
Singapore	<p>Open market operations: daily using short-term money market instruments with fixed tenors: SGS repos/reverse repos; FX swaps/reverse swaps; and direct borrowing/lending.</p> <p>Standing facilities: end of day liquidity facility (2 percent over 1-month SIBOR); intra-day liquidity facility; borrowing and lending rates (+ - 50 basis points of reference rate, equal to the weighted average of dealer bids for overnight deposits)</p> <p>Other: 3 percent Minimum Cash Balance, unremunerated, with 2-week averaging provisions between 2 and 4 percent. Foreign exchange interventions (aimed at maintaining the currency within an unannounced trade-weighted band)</p>
Belgium (ECB)	<p>Open market operations: Refinancing operations (one week and three months); ad-hoc fine tuning operations; structural operations. The weekly 7-day OMO is conducted at a rate marginally above the policy rate (minimum repo bid rate). The 3-month OMO repo is conducted at market rate.</p> <p>Standing operations: overnight marginal lending and deposit facilities with rates set at +, - 100 basis points policy rate.</p> <p>Other: 2 percent reserve requirement, remunerated at the policy rate; full reserve averaging; maintenance period set to coincide with Governing Council meetings which decide on the policy rate.</p>
UK	<p>Open market operations: Weekly repos (circa 1 week maturity, depending on timing of policy meeting) conducted at the Bank/policy rate; overnight fine tuning operations at end of monthly maintenance period; monthly long-term repos (3, 6, 9, and 12 month maturities) conducted at market rate (will in time be replaced largely by the outright purchase of longer-term securities).</p> <p>Standing facilities: overnight lending and deposit facilities with rates set at +, - 100 basis points Bank rate (25 basis points on the final day of the maintenance period)</p> <p>Other: no reserve requirement; contractual reserves remunerated at the Bank rate; full averaging; maintenance period starting on MPC announcement date and ending the day before the next MPC meeting.</p>
India	<p>Open market operations: Market stabilization bonds (91-day to 1 year); liquidity adjustment facility (overnight)</p> <p>Liquidity adjustment facility: repo and reverse repo operations (overnight)</p> <p>Other: 7.5 percent Cash Reserve Ratio, to be fully met on a weekly basis; at least 70 percent of the requirement also has to be met on a daily basis; foreign exchange intervention (aimed at smoothing volatility)</p>
<p>Sources: http://www.ecb.int/mopo/implement/intro/html/index.en.html; http://www.bankofengland.co.uk/markets/money/index.htm. See also http://www.bis.org/publ/bppdf/bispap23c.pdf http://www.sgs.gov.sg/resource/pub_guide/guides/SGPMonetaryPolicyOperations.pdf</p> <p>Note that all these countries except the United Kingdom and Hong Kong SAR maintain reserve requirements, but except for India they are rarely changed, or used as an instrument of monetary policy.</p>	

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III. MONETARY POLICY COMMUNICATION AND TRANSPARENCY¹

A. Introduction

1. **This paper discusses the role of communication in enhancing the effectiveness of monetary policy in India.** Monetary policy worldwide has evolved toward increased transparency in the past 15 years (Figure III.1). This trend partly reflects the adoption by many advanced and emerging countries of inflation targeting frameworks, which put a premium on clear and frequent communications. As India is increasingly scrutinized by external investors, implementing best practice policy in the area of communications would ensure that market expectations are formed efficiently. This in turn would help the central bank address the challenges that India's increased financial globalization poses to the conduct of monetary policy (see Chapter II).
2. **In 2004, the RBI took measures to enhance its effectiveness and provide clearer policy signals.** At its mid-year policy review, the RBI announced that, while retaining a variety of instruments, it would conduct monetary policy mainly through secondary market operations with government securities.² It also simplified its operating framework, casting policy in terms of two key policy rates (the repo and the reverse repo rates) and clarifying the role of each instrument. This move increased transparency and reinforced the policy signal of each instrument, possibly eliciting a stronger response from firms and individuals. Timely increases in policy rates since October 2004 have signaled the RBI's commitment to price stability, moved monetary policy to a less accommodative footing, and avoided the need for a more aggressive move later.³ The RBI has also since 2005 increased the frequency of its formal policy communications by shifting to a quarterly schedule of policy reviews, announcing the date of the next review in the policy statement and accompanying press statement issued at the end of each review.
3. **More recently, some in the market have questioned the RBI's credibility as the need to cope with rising capital inflows has led to policy moves and a change in operating procedures that were not well anticipated by market participants.** Since October 2006, capital inflows have averaged \$4.6 billion a month, double their level during the past 12 months (Figure III.2). In response, the RBI altered the conduct of monetary policy in several instances, each time surprising the markets. Since October, it de-linked the two policy rates, which had earlier moved in tandem. Since December, it has raised bank reserve

¹ Prepared by H el ene K. Poirson.

² The Market Stabilization Scheme (MSS) was introduced in April 2004 with an initial ceiling of Rs. 600 billion for 2004/05. Issuance of market stabilization bonds (MSBs) has been used since in conjunction with other instruments, such as daily repo operations under the liquidity adjustment facility (LAF), to manage liquidity.

³ The third policy rate (the bank rate) was left unchanged.

requirements five times by a cumulative 250 bps (as against the stated medium-term objective of reducing the cash reserve ratio—thereafter CRR—to 3 percent), and changed twice its procedures for liquidity absorption. Unlike in 2004, the recent moves seem to have reduced transparency and weakened the policy signals, introducing confusion among market participants. Policy measures taken in March-April in the absence of sufficient guidance by the RBI have also led to a perception of weakened independence of the central bank.⁴

4. **A clarification of the RBI’s objectives and operating framework and instruments, including the role that the cash reserve ratio (CRR) plays in the new framework, would be useful at this juncture.** CRR hikes in late 2006 and early 2007, in conjunction with hikes in the repo rate, were perceived as tightening signals; however, more recent CRR hikes (with interest rates left unchanged) appeared aimed primarily at liquidity management. Clarifying the respective roles of the CRR and policy rates would enable the public to better understand the new policy regime, predict policy decisions, and anticipate how the RBI might react to likely contingencies. Section B argues that more frequent policy meetings together with enhancements in the key policy documents and arrangements surrounding their release would also help clarify policy signals. Section C discusses other communication activities, including building an ongoing dialogue with markets and information sharing.

5. **This paper focuses on *communications* policy but recent communication challenges faced by the RBI also reflect characteristics of the recent *conduct of monetary policy* and the absence of a clear *measure of the cost of living*.** The RBI’s approach has led to a perception among market participants that RBI intervention in foreign exchange markets to stem rupee volatility (only partly sterilized) has loosened liquidity conditions, undermining the stated goal of a tight stance of monetary policy. The risk is that this strategy will become unsustainable if inflows become large enough, overwhelming the RBI and forcing it to tolerate more exchange rate volatility.⁵ The public understanding of inflation performance and the outlook is also hampered by conflicting signals sent by indicators other than the WPI, such as the recent divergence between CPI and WPI inflation. Until a resolution of these basic policy and data issues has been achieved, the RBI may expect persistent difficulties in its external communication efforts.

⁴ With high inflation seen as a major political liability, the RBI was perceived as being under pressure to tighten policy. The moves in March (hike in the repo rate and CRR) and April (faster currency appreciation) surprised markets as they were not accompanied by sufficient guidance (Malik, 2007). Moreover, the Ministry of Finance’s concurrent statements on inflation may also have contributed to a perceived lack of RBI independence (see Chandavarkar, 2005, for a broader discussion of this topic).

⁵ One analyst characterized the main risk to the macro outlook as “RBI finds it too difficult to manage the balance between holding the exchange rate and keeping liquidity conditions tight.”

B. Communication of Policy Signals

Strengthening the RBI's Policy Signaling

6. Two specific issues arise in the signaling of adjustments in the stance of monetary policy: the timing of such signals and their clarity.

- With regard to the timing of policy signals, the RBI's approach over the past year has been discretionary. Rather than using the quarterly reviews to announce policy changes—as has been the practice since the 2005 shift to more frequent reviews—the RBI chose to adjust the CRR post-review in December 2006, surprising market participants. Increasing the frequency of policy meetings would reduce the need for such inter-meeting measures, allowing the public to anticipate and prepare for a possible change in policy stance. In other countries, policy decision-making meetings are held 8–12 times a year. The policy stance can still be changed between meetings, but only in the case of an emergency such as risk of financial instability.
- Expanding on its current practice of announcing the date of the next review following the conclusion of each review, the RBI could also consider pre-announcing the schedule of policy meetings for the year ahead.⁶ When announcing the schedule, the RBI should make clear that *adjustments in the policy stance will only occur on the pre-announced dates* except in exceptional circumstances.
- This also implies that the RBI's intervention in the foreign exchange market should be fully consistent with the announced policy stance (Heenan and others, 2006). In particular, if the policy stance is tight, the intervention should be fully sterilized to avoid being perceived as a loosening measure.

7. **There is also a need for the RBI to improve the clarity of its policy signaling.** The current situation is complicated by the fact that the RBI has been using several instruments, not just the key ones identified in the 2004 Review (namely, hiking the two policy rates in tandem to maintain a stable policy corridor, LAF, and MSBs), to achieve its objectives. As a result, some market confusion over the RBI's signaling appears to be undermining the effectiveness and credibility of monetary policy. Several examples of unclear policy signals are outlined below:

⁶ Pre-announcing a schedule of policy meetings is a relatively recent innovation internationally, but has quickly become standard practice. For financial market participants, analysts, and the media it is helpful to know that adjustments in the central bank's policy stance will only take place (except in extraordinary circumstances) on the pre-announced dates, minimizing confusion over the interpretation of actions and comments by the central bank.

- The decoupling of the two policy rates in October 2006 created market confusion, sending mixed signals as to the RBI's underlying adjustment in its policy stance. Market participants expected the rates to be hiked in tandem, as they had been in the past year. Some observers interpreted the decoupling as an implicit decision by the RBI to use the repo rate as its key operational policy rate, reflecting the tight money market conditions prevailing at the time. Others perceived it as a more modest tightening than if both rates had been increased. Still others interpreted the move as a decision not to tighten firmly policy, despite inflation risks (see below). An important first step to clarifying policy signaling is to reestablish a policy corridor, keeping the difference between the two policy rates constant.
- Another example of the lack of clarity in current arrangements is that the policy assessments on October 31 and January 31 highlighted the need for a firmer policy response⁷ but the reverse repo rate was left unchanged. Observers unfamiliar with money market conditions would conclude that the RBI decided not to tighten despite inflation risks. In the event, the RBI tightened liquidity via two post-review CRR hikes. The moves affirmed the RBI's firmer policy stance but, unlike a hike in the reverse repo rate, gave the market no clear indication as to how much of a rate increase was consistent with the tighter liquidity conditions. In the event, lending rates remained unchanged in October, but increased in January by 50 bps (following the December CRR hike) and in March by another 60 bps (following the February hike).
- A third example of lack of clarity in policy implementation was the February 26 decision to start remunerating excess reserve requirements. The impact of this measure ran counter to that of the CRR hike announced on February 13, adding to confusion among market participants and analysts on the underlying policy stance.
- A fourth example was the decision on March 2 to limit the absorption under the LAF, which some analysts interpreted as an effective easing of monetary policy.⁸ Other observers considered it a confirmation of the role of the repo rate as the new RBI's key operational rate, given that the move effectively made the reverse repo rate irrelevant.

⁷ Analysts perceived the statement as relatively more skewed toward containing inflation than previous statements, which indicated a balance between inflation and growth.

⁸ Shortly following the move, call rates dropped below the floor of the RBI's policy corridor.

- Finally, at its July policy review, the RBI raised the CRR but left interest rates unchanged. The market was left guessing what interest rate was consistent with the new liquidity situation.

8. **Overall, the emphasis should be on clarifying the operational tool(s) of monetary policy.** Currently, it is unclear whether it is the repo rate, the reverse repo rate, the bank rate, the CRR, or other mechanisms that are the main operational tools of monetary policy. Reverting to the earlier system of maintaining a consistent corridor for the repo and reverse repo rates, ensuring that the market rate remains within that corridor by using market based mechanisms such as the stabilization bonds to absorb liquidity, and reducing reliance on the CRR would enhance the clarity of the RBI's policy actions.⁹ However, the RBI may consider the use of all monetary policy instruments (including the CRR) warranted under current circumstances. If this is the case, to avoid confusing markets, the RBI should explain and clarify the new operational framework, including the role that each instrument plays in this framework.

9. **It would also be helpful to clarify the RBI's approach to foreign exchange market intervention.** Given the market perception that the RBI faces a difficult balancing act between its focus on addressing inflationary pressures and resisting fast rupee appreciation (the "impossible trinity"), it is important to ensure that any intervention does not send conflicting signals. This can be done by establishing a set of criteria for internal RBI use to decide when intervention is likely to be effective and also consistent with the RBI's stated objectives. In this regard, the RBI could draw on the analysis in De Gregorio and Tokman (2005) and Holub (2004), and also the intervention criteria proposed by the Reserve Bank of New Zealand (Box III.1). Such criteria are tailored to countries' individual circumstances, but all require the central bank to take a view on equilibrium exchange rate levels (and associated risks), similar to the inflation and growth outlook and uncertainties guiding interest rate decisions. The practice, suggested earlier, of preannouncing a schedule of policy meetings would also minimize the risk that RBI actions in the foreign exchange market (even fully sterilized) are misinterpreted as policy signals.

10. **The RBI could also use existing fora such as the FIMMDA (Fixed Income Money Market and Derivatives Association of India) to clarify its approach to market operations.** By using these fora more actively, the RBI could help minimize market confusion regarding the implementation of monetary policy (Section C).

⁹ The use of CRR can be problematic and puts a premium on clear communication by the RBI, as future cuts in the CRR may be perceived by markets as monetary policy measures, even though they are structural measures (aimed at producing a more level playing field for financial institutions). Such an example of misunderstanding of CRR cuts occurred during the late 1990s when the market interpreted them as a policy loosening.

Moving the RBI's Communication Strategy Closer to Best Practice

11. **The RBI's communication strategy already follows best practice in many areas.**

This section discusses further enhancements that would support greater transparency and effectiveness of monetary policy, including increasing the forward-looking and analytical content of RBI policy documents and modifying arrangements surrounding their release.

The Quarterly Review

12. **In general, written policy documents are the primary vehicle for both policymaking and communication of policy decisions.** They serve two purposes. First, their preparation should provide a comprehensive and forward-looking framework for discussion among the Governor(s) and advisory committee members as an aid to their decision making. Second, their publication allows the Governor(s) (or monetary policy committee in countries that have such an arrangement in place) to share their thinking and explain the reasons for their decisions to those whom they affect.

13. **The RBI Annual Statement and Quarterly Reviews (with the accompanying report on Macroeconomic and Monetary Developments—thereafter, MMD) satisfy these requirements in large measure, and the overall quality of the documents has improved.**¹⁰ Two changes deserve special mention: the noticeable shift from a simple description to more explanation of developments and the shift to more forward-looking analysis. The suggestions, which follow, are intended to further increase the effectiveness of these reports as communication devices.

14. **Some specific areas in which the Reviews and the MMD have improved since 2004 include:**

- The discussion of Inflation Conditions in the MMR is more thorough: in addition to descriptive sections, it now provides an **analytical understanding** of the driving forces behind developments; it also provides a **review of past policy measures**, including an explanation of the way in which risks and uncertainties have been taken into account in policymaking.
- The Real Economy chapter (also in the MMR) now includes a forward-looking discussion of **business expectations** (based on survey data) and a review of **GDP growth projections** by different agencies.

¹⁰ The frequency of published policy reviews was also increased from annual to quarterly starting in April 2005.

- The Review provides an overview of recent economic and financial developments, as well as a **forward-looking assessment of how they are expected to affect the outlook** for inflation and inflation pressures.
- Recent Reviews provide a **clear explanation of how RBI's approach to setting policy in the quarter ahead will differ** from that in the previous quarter. For example, the 2006/07 Third Quarter Review clearly stated a shift in emphasis toward managing liquidity.
- The Review has become quite candid in describing various **risks and uncertainties**, such as lags in transmission, exogenous factors influencing prices, and how these uncertainties are weighed in reaching policy decisions.

15. **At the same time, there are a number of areas and elements where further improvements can be made.** The suggestions that follow pertain to the Review. Substantive changes could be introduced over a few quarters (changes involving the development of new statistics and data—highlighted in italics—could be implemented over 1–2 years).

- The **overlap between the Review and the MMD** could be eliminated, by shortening the descriptive parts in the former (already discussed at length in the MMD). Even the more analytical parts of the Review, such as the discussion of financial markets' responses to past policy measures, could be shortened if, as suggested below, the MMD itself took a less descriptive, more analytical, approach.
- The **Review could be much shorter** (best practice is to keep the statement under two pages—compared to 52 pages in the October Review). It could emphasize only new information since the last Review, perhaps in the form of bullet points. Should the RBI implement the suggestion of adding an additional policy meeting in between reviews, only an interim Review would be published at these meetings (the MMR would continue to be issued quarterly). A way to keep the statement short in the absence of the MMR would be to simply supplement it with a package of charts used in the policy meeting for background (as is done for example by Norges Bank).
- Given the flexible monetary policy framework in India (monetary policy has a dual objective—price stability and adequate credit growth—and uses a multiple indicators approach), it is critical that the Review **explain clearly and credibly how considerations other than inflation are factored into decision-making**, in a manner consistent with the RBI's medium-term objective (a 4 percent ceiling on inflation).
- To this effect, it is suggested that the Review **state the Policy Actions upfront** (rather than at the end) followed by a discussion of the outlook and risks factors and a succinct discussion of macro and monetary developments.

- It is also suggested that each Review **link back to discussion in the previous Review or quarterly MMD** in a more specific manner (the link is already present in a general form). For instance, the policy statement could refer to the realization or non-realization of risks included in the previous review. This could help better convey the continuity and inter-temporal coherence in the RBI's policy approach.
- Devolving a full section to the **outlook and risk factors** would present an even more accurate picture of the uncertainties and responses to these uncertainties.
- The discussion of **alternative scenario(s)** in the outlook and risks section would enhance transparency and credibility. For instance, the RBI could discuss the inflation and growth outlook under a “no-measures” scenario (e.g., unchanged interest rates). Scenarios exploring the impact of shocks to oil or other international commodities prices could also be considered, as warranted.
- Finally, the Review could publish an **inflation expectations survey** and market forecasts of interest rates, in addition to the growth forecasts already published.¹¹

16. **Improvements can also be made in the MMD.** Some of the suggested changes are substantive, while others (such as the introduction of summaries) could be implemented immediately:

- The discussion of economic and financial developments still tends to be descriptive rather than analytical, and the big picture tends to be buried in an excess of detail. The value of this chapter could be enhanced by deepening the ongoing efforts to shift the emphasis from detailed description to the **driving forces** behind developments and **how they have been transmitted** through the key financial, real, and nominal economic developments. This shift in emphasis would allow the MMD to be shortened and therefore more accessible to interested readers.
- The following specific suggestions could help shorten and sharpen the focus of several sections of the MMD. The sections on **international developments** in the Price Situation and Financial Markets could focus only on the global developments that have affected domestic variables and the mechanisms through which this has happened. Another suggestion would be to expand the **real economy** chapter into two sub-chapters, the first covering Demand Developments (Domestic Demand as well as External Demand and Net Trade) and the second covering Output and Supply Developments. This would help structure the discussion in a more analytical way, conveying to the reader a clear sense of the extent of overheating in the economy and whether the overheating is likely to be temporary (e.g., due to short-term supply

¹¹ The RBI is conducting an inflation expectations survey, but the results are not publicly available.

- bottlenecks) or more permanent. It would also allow some shortening, as the External Economy chapter would be replaced with a shorter discussion under External Demand and Net Trade.
- The **demand developments** section would include a discussion of government spending, private investment, and consumption, and other leading indicators such as retail sales, car sales, etc.
 - The **supply developments** section would include a discussion of *labor costs and other indicators of tightness in labor markets such as the unemployment rate, capacity utilization rates, and producer prices*. Currently, these indicators, except for capacity utilization rates, are not mentioned at all. There are well-known data limitations in India in this regard: addressing those should be a priority of future data improvement efforts given their importance in policy decision-making.
 - The chapter on the **fiscal situation** could, like the External Economy chapter, be shortened and subsumed under the Real Economy chapter (Domestic Demand section, under the discussion of government contribution to domestic demand).
 - The chapter on **financial markets** could be subsumed under a more general chapter on Money and Financial Markets (replacing the current Monetary and Liquidity Conditions chapter). The descriptive parts could be shortened and more emphasis placed instead on reviewing and assessing how the market has responded to past RBI monetary measures and the linkages with global markets.
 - The Financial Markets discussion of asset price developments should be expanded to the **housing market**, given the growing importance of this asset segment. *This would require nation-wide data on housing prices and housing market developments, such as home sales and new construction.*
 - In addition, the discussion of interest rate developments in that section could be made more reader-friendly by casting it broadly in terms of **short-term versus long-term interest rates**.
- It is also suggested that the RBI discuss developments in **core inflation** and **seasonally adjusted q/q inflation**, which would uncover turning points in inflation more rapidly than y/y data. When introducing such measures, the RBI should provide analysts with a short note describing how they are constructed (ideally, together with a spreadsheet to eliminate all ambiguity). These could also be posted on the RBI website. *Eventually, the CSO could be responsible for the production of core inflation measures*. Research suggests that the credibility of core inflation measures calculated and published independently by statistical offices is less likely to be questioned, than if the measures are produced by the central bank (Heenan and others, 2006).

- Parts of the discussion of recent economic and financial developments still tend to be backward-looking. To advance the ongoing shift toward a **forward-looking** emphasis, the MMD could more systematically relate the developments to inflation forecasts. For instance, the RBI could consider concluding the Price Situation chapter with a section on Short-Term Inflation Prospects. The latter would discuss factors likely to influence price developments in the near-term, such as recent supply developments (food, energy, and international prices) and the extent to which they may have a more permanent impact on inflation. In addition, the section could discuss how it expects the effect of administrative measures (such as export and futures trading bans and hikes in administered prices, e.g., for energy) to play out.
- Such changes and shortening would make room to add a new chapter on the **economic outlook**, covering the whole economy and transmission mechanism. It would discuss the RBI's inflation and growth projections and attendant risks; determinants of future inflation (including prospects for energy and import prices, labor costs, inflation expectations); and the outlook for demand (consumer spending, government spending, and private sector investment); and GDP. *This would require that the RBI develop surveys of wages and inflation expectations, and other such metrics of expectations and labor costs.*

17. **The table below illustrates a possible new structures for a streamlined Review, supported by a more analytical, forward-looking, MMD.**¹²

Present MMD	After Recommended Changes (New proposed sections are in italics)
1. The Real Economy	1. Money and Financial Markets
2. Fiscal Situation	2. Real Economy
3. Monetary and Liquidity Conditions	<i>2.1. Demand Developments</i>
4. Price Situation	<i>2.2. Output and Supply Developments</i>
5. Financial Markets	3. Price Situation
6. The External Economy	<i>4. Economic Outlook</i>
	<i>4.1. The Outlook for Demand and GDP</i>
	<i>4.2. The Outlook for Inflation</i>

¹² The recommended structure for the MMD (resp. Review) is loosely based on the Bank of England's Inflation Report (resp. Norges Bank policy statements), and is only indicative. Both could be tailored in a way that suits the RBI's communication objectives.

Present Review	After Recommended Changes (new proposed sections are in italics)
1. Assessment of Macroeconomic and Monetary Developments	1. Monetary Measures
2. Stance of Monetary policy	2. Outlook and Risks, including discussion of <i>projections based on constant interest rates*</i>
3. Monetary Measures	3. Macroeconomic and Monetary Developments
*/Or an alternative scenario deemed appropriate by the RBI.	

The Release of the Annual Statement and Policy Reviews

18. **A review of the arrangements surrounding the release of the Annual Statement and Reviews suggests that they already follow best practice in many areas.**

- The press release states upfront the decisions regarding the setting of the policy instruments, thanks to the introduction of a useful “Highlights” section.
- The release of the policy decision is accompanied by a press conference at which the basis of the policy decision is explained, followed by a Q&A session.
- A webcast of the conference and Q&A session is also available on the RBI website for the benefit of market participants and members of the press.

19. **A number of changes might be made that could further improve the efficiency and impact of these events.** Changes would aim at streamlining and standardizing communications activities on the days that policy decisions and the MMD are released.

- The effort to shorten and focus the press release (from 22 pages in May 2004 to 5–6 pages at present) is a welcome step. Further efforts could be made—best practice is for press release to remain **under two pages** in length.¹³
- It is recommended that the RBI also make **presentations of the MMD** when the report is released.
 - The first presentation in the morning of the release should be restricted to the **press**, but a webcast could be made available on the RBI website for the benefit of market participants.

¹³ If the Review is shortened to under two pages as suggested in section B, there would be no need for a separate press release.

- A second presentation would be made in the afternoon, to a restricted audience of market **analysts, academics, and government officials**. This would provide the opportunity for more in-depth discussion with the more sophisticated audience. Such an opportunity would improve market understanding of the basis of policy decisions. Officials in the ministry of finance, CSO, and other government agencies that may be interested in better understanding monetary policy should be invited to attend.
- It is suggested that the RBI Governor consider following the common practice of discussing the main quarterly Reviews or just the Annual Policy Review (and supplementary background documents) with a relevant **parliamentary committee**. Even if such appearances are not required, they would help build broad political support for the policy framework (Heenan and others, 2006). The practice is also recommended in the *IMF Code of Good Practices on Transparency*.
- Finally, the RBI could at a later stage consider the publication of **minutes** of the policy-making committee (also a practice recommended in the Code of Good Practices), although followed by only a few central banks worldwide.

C. Other Communication Activities

20. **In the current more open financial environment, it is particularly important for the RBI to establish and maintain strong channels of communications (see Chapter II).** In particular, reaching out to financial sector participants is key, since they have a crucial role to play in explaining RBI policy to others (investors, etc.) and in influencing wider perceptions of the role of the RBI.

21. **The RBI may be able to improve its communications with the financial community by building on and intensifying the ongoing dialogue on policy issues.** Senior RBI officials already participate in many existing forums for members of the financial market and business community, and their speeches and interventions in such forums are a key instrument in shaping the policy debate and conveying the RBI's objectives and policy approach. The Governor also presents the policy statement to chief executives of commercial banks. Establishing a separate briefing for analysts would be an important next step to make such interaction regular and systematic. Along these lines, the RBI could also establish a regular (perhaps semi-annual) round table to discuss policy and forecasting issues with analysts. It could participate in (or establish) a program of workshops or seminars for presenting papers on various research and policy topics. It is important that such contacts take place not just at the most senior levels of the institutions involved, but also at the level of regular economists. Here it would be important to ensure RBI staff familiarity with communication rules, which senior officials of the RBI already observe fully (Box III.2).

22. **The RBI could consider sharing information on its approach to forecasting.** Transparency in the central bank's research will help bolster confidence in its capability and

commitment and help educate markets about the functioning of India's economy. Without sharing precise functional forms or parameters of its forecasting models, it could share information on the forecasting framework, the types of short-term forecasting models used, the basic structure of the medium-term model, and general form of the equations, and the approach taken to parameterization. At some point, the RBI could prepare and present a paper explaining more in detail the full model(s).

23. **External communications can also be enhanced by providing much more basic information on monetary policy through the RBI website.** While the site already provides a wealth of information and data, including publication of all speeches given by the Governor and Deputy Governors, it lacks a basic description of the monetary and policy framework. The best practice would be to post under the "Policy Documents" subdirectory—which already includes links to previous policy documents—a schedule of future policy releases, as well as documents describing the basic building blocks of monetary policy:

- The **framework for the RBI's monetary and exchange rate operations**, including the details of the various instruments, facilities, and regulations and links to relevant documentation, research, and data.¹⁴
- The **policy framework**, including the RBI's legal framework (already featured under another section) and the broad lines of the policy decision making process.
- The RBI's understanding of the **monetary policy transmission mechanism**.

24. **Additional actions the RBI could take to improve the broader dissemination of information on the MIA framework and its approach to policy issues include.**

- Publishing a series of pamphlets containing basic explanations of various aspects of the MIA framework. These could be posted in a new "Education" section on the website.
- Expanding on the Frequently Asked Questions (FAQ) section on the website: the existing chronological list of postings is a good start, but the presentation of Q&A could be standardized to make it more user-friendly, and the coverage of topics expanded. The Federal Reserve Bank's FAQ section provides an excellent example.¹⁵

¹⁴ Almost all inflation targeting central banks and central banks of advanced countries provide such documents on their websites. Some would provide excellent models for RBI documents. See, for example, <http://www.federalreserve.gov/policy.htm>, <http://www.boj.or.jp/en>, or <http://www.rba.gov.au/>.

¹⁵ <http://www.federalreserve.gov/faq.htm>.

Box III.1. Criteria for Intervention

Central banks in several countries have adopted internal criteria to ensure that intervention is effective and does not undermine policy credibility by providing signals about the future course of monetary policy that are inconsistent with the stated policy objective(s). For example, under an inflation targeting (IT) regime, any intervention in the foreign exchange markets needs to be consistent with the medium-term inflation target objective. When countries are classified as free-floaters, they may still reserve the right to intervene, but intervention should be sporadic enough to not warrant a change in classification.

Intervention criteria vary according to the individual country circumstances:

- Countries with freely floating exchange rates and where risks associated with financial and price instability are low limit intervention to exceptional circumstances in the exchange rate market. For example, following the shift to a free float in the late 1990s, the central bank of Chile retained the right to intervene when it believes that the exchange rate is becoming misaligned. Interventions—including dates and maximum amounts—are pre-announced, in order to work through the information channel (empirical studies find this channel to be more effective, the larger the uncertainty in the market, as measured by exchange rate volatility). Lack of effectiveness indicates that exchange rate movements could result from a need for real currency depreciation. Therefore, intervention is limited in time; it does not target a particular level, but rather aims to avoid an excessive weakening of the currency that could raise inflation. In practice, such interventions have been rare and not automatic, involving actual \$ sales well below the announced maximum.^{1/}
- The Bank of New Zealand follows similar criteria for intervention, with an additional requirement of consistency with the IT regime. Specifically, before intervening the Bank of New Zealand needs to be satisfied that the following criteria are met: (i) the exchange rate must be exceptionally high or low; (ii) the exchange rate must be unjustified by economic fundamentals; (iii) intervention must be consistent with the Policy Targets Agreement; and (iv) conditions in markets must be opportune and allow intervention a reasonable chance of success.^{2/}
- Countries with managed floats and inflation targeting (IT), like the Czech Republic, retain the possibility to intervene “in the event of excessive volatility or unjustified exchange rate trends.” In this context, Holub (2004) proposes criteria to ensure regime consistency, based on the idea that interest rates should remain the primary tool of monetary policy and interventions (if any) should work in the same direction as interest rate changes. In practice, this would mean that interventions against appreciation are admissible only when: (i) the inflation forecast undershoots the target and/or the output gap is negative; (ii) the interest rates are relaxed and/or declining; and (iii) exchange rate developments are viewed as a direct cause of target undershooting, i.e. the currency is judged to be misaligned in relation to fundamentals or moving in that direction quickly. In practice, the criteria need not be adhered to rigidly, but can serve as useful guidance to avoid a possible credibility loss from sending mixed signals.^{3/}

1/ De Gregorio, J. and Andrea Tokman R., 2005, “Flexible Exchange Rate Regime and Forex Intervention,” in *BIS Papers* No. 24 (Basel: Bank for International Settlements).

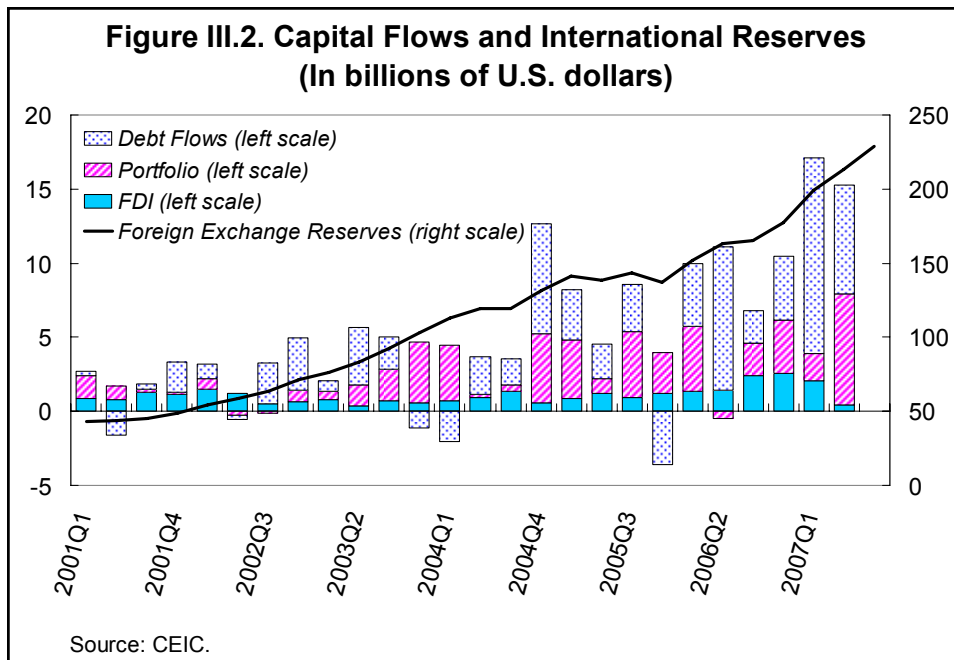
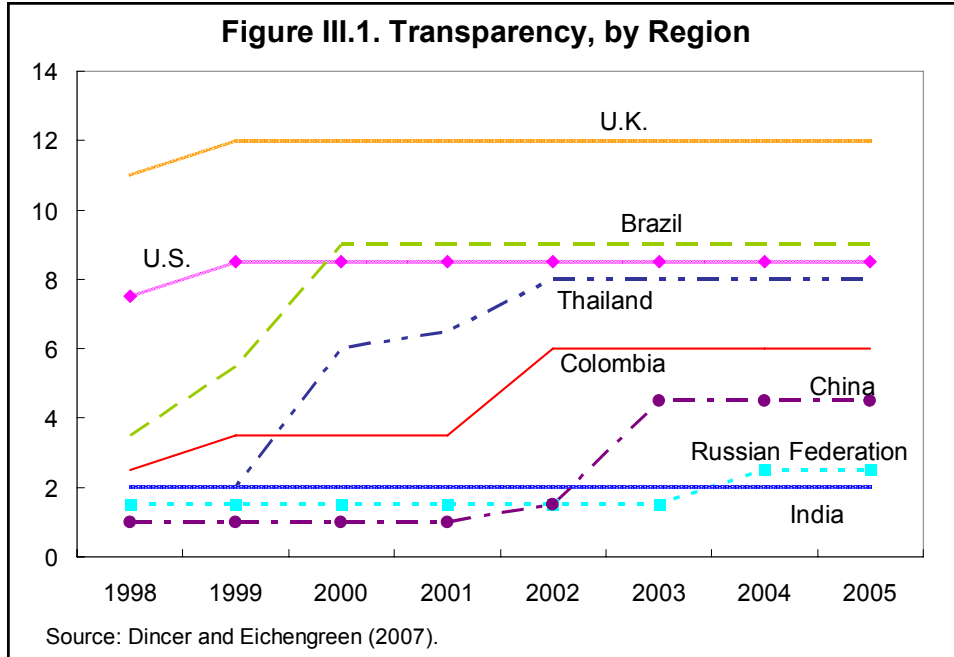
2/ Eckhold, Kelly and Chris Hunt, 2005, “The Reserve Bank of New Zealand’s New Foreign Exchange Policy,” in *BIS Papers* No. 24 (Basel: Bank for International Settlements).

3/ Holub, T., 2004, “Foreign exchange Interventions Under Inflation Targeting: the Czech Experience,” CNB Internal Research and Policy Note (Prague: Czech National Bank).

Box III.2. Rules of Communication: Examples^{1/}

- It should be assumed that all “off-the-record” discussions with the press will be leaked until a set of rules has been established that the press will abide by;
- Policy discussions should not take place outside the context of regular Reviews;
- Policy implications of data releases should not be discussed outside the context of Reviews;
- Changes in forecasts should not be discussed outside the context of Reviews. In the week prior to any policy meeting, “radio silence” (no speeches, briefings, etc.) should be maintained.

1/ Such “rules” are simple guidelines evolved from common sense, which are already followed at the RBI.



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IV. FINANCIAL DEVELOPMENT AND GROWTH IN INDIA: A GROWING TIGER IN A CAGE? ¹

A. Introduction

1. **Will financial frictions pose an increasing constraint to growth in India?** This is a highly relevant question, both because the financial system is underdeveloped and because corporate investment is expected to continue playing a key role driving India's growth (Figure IV.1). The rapid pace of India's corporate sector expansion will in turn continue to require very large amounts of funds. Analyzing sources of corporate funds will shed light on whether India's financial system might need further upgrading. If firms increasingly use external funds (funds from outside of the firm)² rather than internal funds (funds generated by the firm's own operations), access to an efficient domestic financial system, or access to foreign financing, will become ever more important to sustain high levels of investment.
2. **This chapter examines three major questions:** (1) are Indian firms increasingly relying on external funds?; (2) are there signs of financing constraints?; and (3) does higher external finance dependence imply weaker firm growth? In answering these questions, the chapter uses firm level data for Indian companies, examines their summary statistics, and estimates standard models from the corporate finance literature explaining capital structure and firm growth together with the external finance dependence measure introduced by Rajan and Zingales (1998). The rest of the chapter is organized around these questions.

B. Are Indian Firms Increasingly Relying on External Funds?

3. **The patterns of corporate finance have changed dramatically since the end of the 1990's.** This chapter uses the Prowess database from Centre for Monitoring Indian Economy (CMIE), a Mumbai-based economic think-tank, which includes detailed financial statement data for about 9,000 companies out of the approximately 10,000 listed companies in India.³ The data include from 3,300 to over 6,000 companies for fiscal years 1993/94 to 2005/06 after omitting errors and incomplete observations (Table IV.1). The majority of firms are over 10 years old (some are over 100 years old). By sector, manufacturing firms are the majority, and financial and chemical sectors are the two largest subsectors. The sample

¹ Prepared by Hiroko Oura and Renu Kohli.

² Throughout the chapter, the term "external finance" is used to indicate sources of funds outside of a firm, including both domestic and foreign finance. The term "foreign" is used to indicate funds from overseas.

³ The firms covered in the database account for 75 percent of corporate taxes and over 95 percent of excise duty collected by the Government of India. The database covers a much larger number of companies than the about 500 Indian firms included in Corporate Vulnerability Utility (CVU) developed by the IMF, based on Worldscope and DataStream. In addition, Prowess has more detailed data fields, such as foreign borrowing, than CVU. Prowess is frequently used in the existing studies on India's financial systems, including Topalova (2004), Love and Martinez Peria (2005), Allen, et al (2006), and Allen, et al (2007).

mostly represents domestic private sector companies (either independent or in a business group), although foreign and government owned companies are much larger on average than private sector companies by sales.

- **The share of external funds in total funds gradually declined through 2003/04** (Table IV.2, left panel).⁴ In particular, there were large-scale repayments of debt since 2000/01, both domestic and external. These repayments reduced the median share of “core” external funds—defined as formal/active sources of funds including long-term debt and equities, and excluding passive/informal sources of funds such as trade credits—in total funds sharply from 26 percent of total funds in 2000/01 percent to 9 percent in 2002/03 and 2003/04⁵ (Table IV.2, right panel). This deleveraging reduced the debt-to-asset ratio, while more or less maintaining the equity-to-asset ratio (Table IV.3).
 - **However, the use of external funds seems to be picking up in the latest couple of years.** The share of “core” external funds has come back up to about 16 percent in 2005/06 (Table IV.2, right panel). The use of foreign borrowing has increased and become more wide-spread across sectors (Table IV.4, left panel).
4. **A combination of factors could have influenced these patterns.**
- *The domestic economic cycle.* Corporate investment declined by about 5 percent of GDP from the mid-1990’s peak through 2001/02, in response to the unwinding of investments made during the early 1990’s boom. The recent pickup in the use of external funds coincides with the pick up in investment that started in 2002/03. Indeed, the growth of corporate investment is much faster than the growth of internal funds, and the share of external funds relative to capital expenditure has increased sharply for nonfinancial firms (Table IV.4, right panel).
 - *Corporate tax rate.* The corporate tax rate has been reduced from 60–75 percent in the early 1990’s to 45 percent in 2005/06 (including surcharges).⁶ This could have contributed to the gradual decline in leverage as it reduced the tax benefits of debt.
 - *Global influences.* Other economies in the world have shown similar corporate finance patterns (whether this reflects the transmission of global factors or

⁴ External funds are defined as long-term domestic and foreign debt, equity, and trade credits, while total funds are defined as external funds plus retained earnings and depreciation.

⁵ As pointed out in Allen, et al (2006), Indian firms hold significantly large amounts of trade credit on their books, indicating a major role as a source of informal external funds.

⁶ Mohan (2007).

coincidence is admittedly unclear). Major emerging markets turned into net capital exporters since 2000, as they de-leveraged after the 1990's crises (IMF, 2004). The corporate sectors in G-7 countries turned into net savers starting around the turn of the century. IMF (2006) discusses possible explanations for the G-7 experiences, including de-leveraging of high debt accumulated during the 1990's; high corporate profits owing to low interest rates and a generalized reduction in corporate tax rates; ongoing technological change that altered the relative price of capital; increased demand for purchasing overseas companies by corporates; and increased demand for cash owing to heightened uncertainty in the business environment.

5. **In addition, there are some notable cross-section patterns.**

- *Age*: Younger firms rely more on external finance, as shown in a high share of external funds in total funds (Table IV.1) and the large share of external funds relative to investment (Table IV.4). This might be because they need to invest in capacity and it may take several years before they become profitable.
- *Size*: Smaller firms have limited access to formal sources of external finance compared to larger firms, and rely relatively heavily on trade credit (as shown in a high share of overall external funds but a low share of core external funds; see Table IV.2). They also tend to rely on equity, most likely from owner-founders, rather than debt (Table IV.3). Despite limited access to core external finance, smaller firms rely on overall external funds to finance their investment more than larger firms (Table IV.4, right panel), indicating their extensive use of trade credits. However, larger firms are more likely to borrow from abroad than smaller firms (Table IV.4, left panel).

6. **Overall, the Indian corporate sector's use of external funds is rapidly increasing** (although the share of external funds in total funds is still below the 1990's peak). Sources of internal funds—corporate profit growth and gains in corporate saving—are strong, but not as strong as corporate investment. Thus, maintaining and improving access to external funds would be key to sustain healthy financing for strong corporate investment going forward.

C. Are There Signs of Financing Constraints?

7. **Economy-wide measures indicate rapid financial development in India in recent years.** Between 2003/04 and 2006/07, the annual growth rate of bank credit to the corporate sector averaged 30 percent y/y, and its share in GDP increased by 5 percentage points to over 16 percent of GDP. Between 2002/03 and mid-2007, the market capitalization of the Bombay Stock Exchange in percent of GDP more than tripled to over 100 percent. Furthermore, capital inflows accelerated sharply from 2 percent of GDP in 2002/03 to 5 percent of GDP in 2006/07, with FDI inflows into Indian companies increasing by 1 percentage point of GDP

and external commercial borrowing disbursements to corporations rising by 2.5 percentage points of GDP.

8. **However, some segments of India's financial system are less developed.** Despite strong growth in recent years, the corporate debt (sum of bank credit to the corporate sector and corporate bonds) to GDP ratio remained below 20 percent in 2006/07, much lower than the average of 60 percent in emerging markets (near 80 percent in emerging Asia, 30 percent in emerging Latin America, and over 20 percent in emerging Europe (IMF, 2005)). Limited reliance on banks to fund corporate investment may reflect regulatory constraints, most notably the Statutory Liquidity Requirement that mandates banks to invest a minimum of 25 percent of their deposits in government securities, and a priority sector lending requirement that mandates domestic banks to lend a minimum of 40 percent of their net credit to the priority sector.⁷ The corporate bond market is underdeveloped, amounting to less than 5 percent of GDP, compared with over 20 percent of GDP in Thailand, Chile and Mexico, and 50–100 percent of GDP in more advanced economies. Impediments include fragmented tax structure, low transparency, restrictive issuance rules, lack of repo markets, and quantitative limits on the investor base (see the staff report).

9. **The empirical analyses in this chapter indicate that corporate financing patterns reflect the uneven and still underdeveloped state of India's financial systems.** The financing patterns and capital structure of Indian firms have several notable features: (1) overall, there is a limited relationship between inherent dependence on external funds and actual use of such funds;⁸ (2) this is particularly true of debt financing, including foreign debt; and (3) equity markets, on the other hand, seem to be tapped by firms with an inherently higher need for external finance.

10. **This chapter employs a unique empirical strategy that properly instruments for external finance demand factors, and hence, can investigate the relationship between demand factors and financing patterns:**⁹

$$x_i = \alpha + \beta RZ_us + \gamma_i + \varepsilon_i \quad (1)$$

⁷ The priority sector includes agriculture, small business, small scale industries, retail trade, education, small housing, and consumption loans among other items.

⁸ Classification of inherent external finance dependence is based on Rajan and Zingales (1998).

⁹ The empirical literature on capital structure often uses firm-level data, and regresses capital structure measures on individual firm characteristics. In the finance-growth literature, such as Rajan and Zingales (1998) and de Serres, et al (2006), industry level cross country data are used, and industry growth in a country is regressed on an interaction term between RZ_us (RZ measure based on U.S. data) and a country specific financial development or financial regulation measure. Since our data are firm-level data for India only, the interaction term is reduced to the RZ_us variable.

The dependent variable x_i is the period average of capital structure measures, including the share of external funds in total funds for firm i , and the share of debt, foreign debt, and equity over total assets. The independent variable y_i is a standard set of firm characteristics known to have explanatory power for capital structure in the corporate finance literature. RZ_us is an instrument for inherent external finance demand introduced by Rajan and Zingales (1998) as an external finance dependence measure (henceforth, the RZ measure), and is calculated as the share of capital expenditure financed by external funds¹⁰ using U.S. data. The analysis uses the calculation of de Serres et al (2006) for ISIC 2-digit level industries, which includes a part of the services sector (but excludes the financial sector).

11. **The RZ measure is widely used as an instrument for external funds demand, in spite of three strong assumptions.** First, some industries are likely to have larger needs for external funds. For instance, the labor-intensive textile industry may not need much external finance compared with capital-intensive heavy industries such as chemicals and petroleum. Second, the cross-industry variation of the demand for external finance is likely to follow the same ordering across countries, implying that if in the United States, the petroleum sector needs more external finance than the textile sector, the same is true in India. Third, and most controversially, the U.S. financial system is assumed to have only limited frictions in supplying finance; therefore, the observed ordering of the RZ measure with the U.S. data¹¹ should reflect demand factors applicable in other countries. While this last assumption is arguably strong, the measure produces consistently reasonable results in the growth-finance literature (including Rajan and Zingales (1998) and de Serres (2006) for instance).

12. **Accepting these assumptions, if a financial system has minimal supply side constraints, it should provide more funds to sectors that inherently are more dependent on external funds** (higher RZ measure). In the model (1), an efficient financial system should be represented by a positive, significant coefficient for the RZ_us . On the other hand, if a financial system is distorted, the industries with large external finance dependence may not necessarily receive larger external resources, resulting in an insignificant or even a negative coefficient for the RZ_us measure.¹²

¹⁰ Defined as (capital expenditure – (cash flow + decrease in inventory + decrease in receivables + increase in payables))/capital expenditure. Cash flow adjusted by changes in inventory, receivables and payables represents internal funds; therefore, the numerator represents external funds that fill the gap between financing needs for investment and internally generated resources.

¹¹ After smoothing short-term cyclical fluctuations; indeed, Rajan and Zingales (1998) used the decade average data to calculate the RZ measure.

¹² A negative correlation between demand intensity for credit and actual amount borrowed indicates a “backward bending” supply curve, which could exist if higher interest rates attract less creditworthy borrowers and lenders cannot observe the creditworthiness of a borrower (Stiglitz and Weiss (1981)).

13. **The model includes a standard set of firm characteristics that are often used in empirical models to explain capital structure by controlling for other relevant factors.**¹³

Debt ratios tend to be lower for firms that are more profitable (hence, cash rich) and have higher market-to-book ratios (the latter is usually considered as a proxy for growth opportunity or Tobin's Q). On the other hand, debt ratios tend to be higher for firms that are larger and those that have more tangible assets that they can pledge as collateral. Therefore, the model includes firm size (using log of sales), profitability (return on asset (ROA)), asset tangibility (ratio of tangible assets to total assets), firm age (using log of years since incorporation at the beginning of the sample period), and dummy variables for ownership. Following Love and Peria (2005), the square of firm age is also included.¹⁴ Models are estimated with and without the market to book ratio, since only a limited number of firms have this data. For models explaining foreign borrowing, a dummy variable to distinguish exporters is added.

14. **Models are estimated for three sets of cross section data:** 1993/94–2005/06 (whole sample), 1993/94–1998/99 (first half), and 1999/00–2005/06 (second half). All the ratios were calculated by first summing the denominator and numerator across time with an aim to smooth annual volatility (similarly to Rajan and Zingales (1998)).

15. **Tables IV.5–IV.8 summarize the estimates.** The two sub-samples include different numbers of observations, reflecting entry and exit of firms. Similar results are obtained even when focusing on a subset of companies that have data for the whole period.

Share of core external funds (Table IV.5)

- **The coefficient on the RZ_us measure is negative and significant for the whole sample and the sub-sample in the 1990's, implying that India's financial system**

¹³ Two relatively recent studies covering non-U.S. firms, Rajan and Zingales (1995, covering G7 countries) and Booth, et al. (2001, covering developing countries) find that despite substantial institutional differences across countries, firm debt ratios in developed and developing countries seem to be influenced by some similar factors. More generally, in a widely cited review of the theoretical literature, Harris and Raviv (1991) conclude that debt use is positively related to fixed assets, non-debt tax shields, investment levels, and firm size, and is negatively related to cash-flow volatility, growth opportunities, advertising expenditure, the probability of bankruptcy, profitability, and the uniqueness of product. Theoretical models are based on agency costs (costs due to conflicts of interest between shareholders and managers or between shareholders and debt holders), asymmetric information (insiders and managers tend to have private information and may undertake inefficient investments), product/input market interaction (among competing producers, and/or between producers and consumers/suppliers), and corporate control considerations (related to takeover activities).

¹⁴ In their study, this variable often has negative and significant coefficients. One possible explanation is that some firms are extremely old (over 100 years in 1994), often in textile and food industries (tea), and they could survive owing to non-market factors. Another possibility is that many age and firm growth related dynamics could take place in a short horizon and then taper off. The squared term could capture these nonlinear effects.

is not allocating resources to firms that have the highest inherent need for external finance, other things being equal.

- **Coefficients for firm characteristics are generally as expected, although the different results for equity and debt have implications that are not clear cut.** Larger firms seem to have better access to external funds, and more profitable firms with rich cash positions tend to rely less on external funds, as expected. The negative sign on age and asset tangibility seems to be picking up its impact on equity finance (younger firms receive equity finance from founding promoters) as shown in the regressions for equity-to-assets (Table IV.8). Foreign and government-owned firms use less external finance overall, especially debt (Table IV.6), but they use more equity (Table IV.8) than private Indian firms. This apparently indicates a stronger preference for equity finance in foreign and government-owned firms, consistent with the findings by Love and Peria (2005). However, it should be noted that these firms, especially government-owned ones, are much larger than Indian independent companies on average, which explains the larger median use of external funds for these firms (Table IV.2).

Debt to assets (Table IV.6)

- **The coefficient on the RZ_us measure is not significantly different from zero for any of the three samples.** All the coefficients for firm characteristics are consistent with the existing literature on leverage (debt-to-equity or debt-to-assets).

Foreign debt to assets (Table IV.7)

- **The coefficient on the RZ_us measure is either not significantly different from zero or is significantly negative for all the cases.** This implies that, so far, evidence is lacking that firms that need more external finance are going abroad in order to avoid constraints in the domestic markets. This could reflect the fact that smaller firms are more likely than large ones to face difficulties borrowing domestically, while big firms have greater access to foreign borrowing.
- **Foreign debt is mostly accessed by large firms.** For each cross-section sample, a model is estimated with all firms and another that includes only the firms with access to foreign borrowing (firms with foreign debt stocks greater than zero). The size impact becomes significant only when estimation is limited to a subset of firms with access to foreign debt. Asset tangibility seems to be associated with increased foreign borrowing. Rather surprisingly, foreign-owned firms are not more likely to access foreign borrowing, but this could reflect a preference for equity finance.

Equity to assets (Table IV.8)

- **The coefficient on the RZ_us measure is generally positive and significant.** In particular, the equity market seems to provide an important source of finance for young and small firms with high growth opportunities in recent years. The estimation also confirms the preference for equity finance by foreign and government owned firms.

D. Does Higher External Finance Dependence Imply Weaker Firm Growth?

16. **Given the evidence above that Indian firms with higher external finance dependence do not tend to borrow as much as less-dependent firms, one would expect to see a negative relation between external finance dependence and firm growth.** To the extent finance matters for growth, such financing constraints are likely to reduce firm growth compared to its potential. Indeed, the studies by Rajan and Zingales (1998, which includes India in their cross-country sample) and de Serres et al (2006, which covers European countries) find that financial underdevelopment reduces the growth rate of an industry that is more dependent on external finance.

17. **Similar empirical models are employed to those for capital structure** (equation (1)). The dependent variable x_i is the annual average growth rate for firm gross value added.¹⁵ Once again, the RZ_us measure functions as an instrument for inherent demand for external funds.

18. **A slightly different set of firm characteristic variables is used, reflecting the literature on firm growth,** and include the initial share of a firm's gross value added in percent of total gross value added for all the firms in the sample, age, a dummy variables for exporters, access to foreign finance, and ownership, and some financial ratios, including ROA, leverage, and market-to-book ratios. Empirical studies by Evans (1987) and Hall (1987) using U.S. data, find that the growth rate of manufacturing firms is negatively associated with firm size and age. ROA and market to book ratio are expected to be positively correlated with firm growth, as ROA could proxy for a firm's efficiency as well as availability of internal funds, and the market-to-book ratio could proxy for growth opportunities.

19. **Similar to the estimations for capital structure, three sets of cross section data are used,** covering 1993/94–2005/06, 1993/94–1998/99, and 1999/00–2005/06. Table IV.9 summarizes the results.

¹⁵ Estimation using other measures such as growth rate of sales, total assets, or gross fixed assets yielded results that were broadly similar to the results from the model with gross value added.

- **The coefficient for RZ_us is negative and significant, indicating that firms in an industry that tend to rely more on external funds are growing more slowly than others.** In addition, this effect seems to be stronger in more recent years. It is possible that the cyclical upturn of investment and increased need for external finance could have tightened the existing constraints in the financial systems
- **Firm specific control variables generally have coefficients with expected signs.** Age is mostly negatively related to firm growth, and high profitability is positively correlated with growth. Access to foreign finance seems to contribute positively to growth.

E. Conclusion

20. **The estimation results seem to provide a case for strengthening the financial system in India, particularly the corporate debt market and the banking sector.** While corporate profitability has risen substantially in recent years, corporate investment has turned around even more sharply, so that firms have started to increase reliance on external finance. While aggregate measures of financial development have shown appreciable improvements lately, estimation results seem to indicate the presence of some financial frictions. In addition, firm growth is negatively correlated with a benchmark for industry-level need for external finance, which could imply the need to upgrade the financial systems in order to sustain high, investment-led growth in India.

21. **The firm growth estimation results pose a puzzle.** Some of India's star corporations are in industries highly dependent on external finance, such as petroleum and chemicals (pharmaceuticals). One possibility is that they are indeed outliers. In particular, the chemicals industry has the largest number of companies, and the median performance could be very different from that of some star performers. This leaves unanswered the question of what factors have allowed the emergence of some star performers in "finance-intensive" industries; a question that is left for future research.

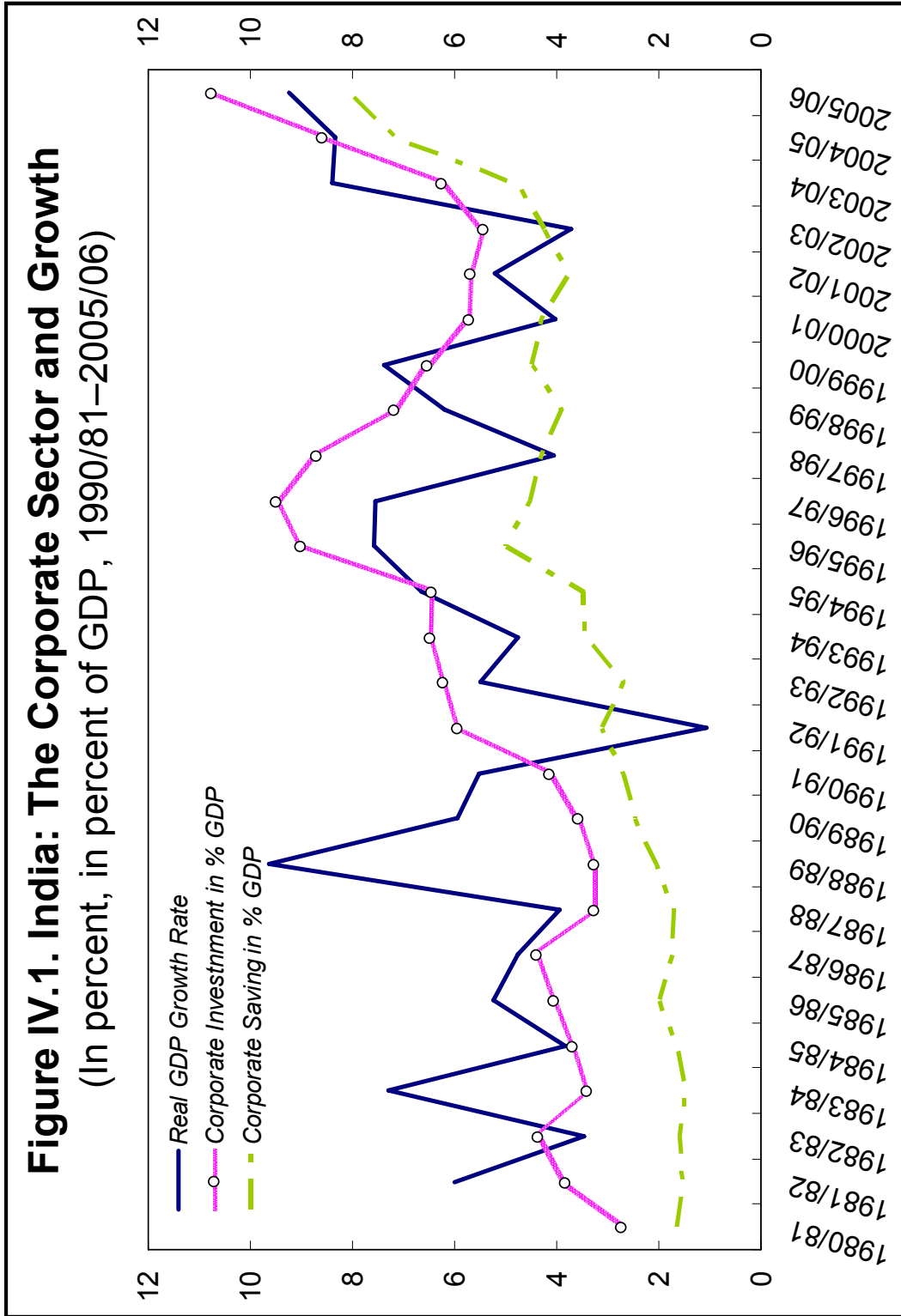


Table IV.1. Distributions of Firms in the Study: Number of Firms

	Number of Firms										Proportion of Firms													
	94/95	95/96	96/97	97/98	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	94/95	95/96	96/97	97/98	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06
Total	3366	4285	4577	4545	4710	5241	5414	5693	6142	6453	5939	5202	100	100	100	100	100	100	100	100	100	100	100	100
Age																								
0-5	573	929	952	749	574	387	295	260	222	261	183	89	17	22	21	16	12	7	5	4	4	3	2	2
5-10	735	867	901	971	1046	1293	1311	1242	1137	1017	664	416	22	20	20	21	22	25	24	22	19	16	11	8
10+	2058	2489	2724	2825	3090	3561	3808	4191	4783	5175	5092	4697	61	58	60	62	66	68	70	74	78	80	86	90
Industry																								
Financial	370	655	788	821	809	863	881	1008	1340	1437	1350	1106	11	15	17	18	17	16	16	18	22	22	23	21
Nonfinancial	2996	3630	3789	3724	3901	4378	4533	4685	4802	5016	4589	4096	89	85	83	82	83	84	84	82	78	78	77	79
Mining	89	121	138	138	136	145	154	161	167	174	164	150	3	3	3	3	3	3	3	3	3	3	3	3
Manufacturing	2427	2853	2916	2833	2916	3208	3262	3286	3311	3402	3123	2835	72	67	64	62	62	61	60	58	54	53	53	54
Food	293	335	355	337	360	408	411	424	423	428	392	359	9	8	8	7	8	8	8	7	7	7	7	7
Textiles	303	382	393	406	407	426	434	437	441	457	415	397	9	9	9	9	9	8	8	8	7	7	7	8
Wood	10	12	13	14	15	16	15	16	17	17	15	15	0	0	0	0	0	0	0	0	0	0	0	0
Paper	78	100	113	109	110	127	143	142	139	151	132	110	2	2	2	2	2	2	3	2	2	2	2	2
Petroleum	28	37	36	36	34	38	42	39	40	44	33	32	1	1	1	1	1	1	1	1	1	1	1	1
Chemical	553	656	647	640	650	709	706	704	702	738	664	593	16	15	14	14	14	14	13	12	11	11	11	11
Rubber	150	191	204	197	200	224	220	215	227	217	209	191	4	4	4	4	4	4	4	4	4	3	4	4
Mineral	132	136	136	129	129	139	140	150	139	143	141	132	4	3	3	3	3	3	3	3	2	2	2	3
Basic metal	232	264	259	238	257	293	298	297	313	309	292	268	7	6	6	5	5	6	6	5	5	5	5	5
Fabricated metal	61	73	74	72	79	92	91	92	88	92	84	76	2	2	2	2	2	2	2	2	2	1	1	1
Machinery	178	206	207	196	195	214	205	214	219	217	210	194	5	5	5	4	4	4	4	4	4	3	4	4
Electronics	224	252	267	255	255	277	282	290	292	300	266	247	7	6	6	6	6	5	5	5	5	5	4	5
Motor vehicle	128	136	136	137	141	151	178	172	177	185	178	149	4	3	3	3	3	3	3	3	3	3	3	3
Transport equipment	28	28	32	26	31	36	34	32	31	33	32	25	1	1	1	1	1	1	1	1	1	1	1	0
Furniture	29	45	44	41	53	58	63	63	64	71	60	47	1	1	1	1	1	1	1	1	1	1	1	1
Service	850	1311	1523	1574	1658	1888	1998	2246	2664	2876	2652	2217	25	31	33	35	35	36	37	39	43	45	45	43
Electricity gas water	27	31	36	36	40	45	46	56	65	70	69	60	1	1	1	1	1	1	1	1	1	1	1	1
Construction	77	102	110	112	126	144	154	173	182	187	163	126	2	2	2	2	3	3	3	3	3	3	3	2
Trade	203	286	325	321	345	400	411	463	501	539	469	379	6	7	7	7	7	8	8	8	8	8	8	7
Hotel restaurant	50	62	61	64	68	73	75	78	80	87	78	81	1	1	1	1	1	1	1	1	1	1	1	2
Transport service	41	49	55	51	65	83	85	95	108	125	104	91	1	1	1	1	1	2	2	2	2	2	2	2
Telecom	9	12	14	20	22	35	37	39	46	50	43	41	0	0	0	0	0	1	1	1	1	1	1	1
Financial	370	655	788	821	809	863	881	1008	1340	1437	1350	1106	11	15	17	18	17	16	18	18	22	22	23	21
Business service	73	114	134	149	183	245	309	334	342	381	376	333	2	3	3	3	4	5	6	6	6	6	6	6
Ownership																								
Private independent	1546	2262	2420	2404	2438	2809	2944	3173	3579	3710	3352	2913	46	53	53	53	52	54	54	56	58	57	56	56
Private group	1383	1523	1609	1617	1713	1810	1838	1867	1899	2006	1924	1725	41	36	35	36	36	35	34	33	31	31	32	33
Foreign	257	293	300	314	336	357	363	364	360	381	347	307	8	7	7	7	7	7	7	7	6	6	6	6
Government	180	207	248	210	223	265	269	289	304	356	316	257	5	5	5	5	5	5	5	5	5	5	5	5

Sources: Prowess database from CMIE; and authors' calculation.

**Table IV.2. Distributions of Firms in the Study: External Funds in Percent of Total Funds
(Ratio of flow variables)**

	93/94 94/95 95/96 96/97 97/98 98/99 99/00 00/01 01/02 02/03 03/04 04/05 05/06										Time Series Average																			
	Median, External Funds Including Long-term Debt, Equity, and Trade Credits											Time Series Average																		
	Median, Core External Funds Including Only Long-term Debt and Equity										Time Series Average																			
Total	73	80	80	75	71	69	69	69	67	66	62	64	64	64	70	46	55	52	41	35	25	26	26	15	9	9	12	16	28	
Age	91	90	93	89	86	88	85	88	88	80	72	80	82	82	86	72	71	76	59	41	41	48	52	37	22	25	30	59	49	
5-10	79	83	83	77	73	72	73	72	69	68	71	73	74	74	74	63	60	60	46	38	26	31	29	15	9	10	16	26	32	
10+	68	75	73	70	67	66	66	65	64	64	60	63	63	66	66	63	47	41	34	32	23	23	14	8	9	12	14	25	25	
Size 1/	85	89	94	91	86	79	78	69	70	63	58	58	77	77	77	69	71	41	19	8	12	7	0	0	0	0	0	0	21	
Small	71	78	76	72	71	69	72	70	70	64	66	64	70	70	70	64	40	48	40	32	30	31	30	26	16	17	16	20	31	
Medium	68	76	73	68	65	65	64	63	64	60	59	65	66	66	66	64	50	44	41	44	34	31	35	26	20	20	31	33	35	
Large																														
Industry																														
Financial	84	86	88	83	84	82	83	81	80	83	75	72	65	81	81	82	67	48	32	36	32	18	13	0	0	0	0	0	30	
Nonfinancial	72	79	78	73	69	66	67	67	64	62	59	63	64	68	68	62	53	48	40	35	24	25	27	15	11	12	17	20	29	
Mining	68	85	71	63	62	50	47	47	53	39	51	54	45	57	57	61	45	32	36	19	16	3	6	3	0	13	10	22	22	
Manufacturing	71	78	77	71	67	62	63	63	60	59	56	63	63	66	66	72	51	41	37	25	25	27	18	14	13	22	24	31	31	
Food	73	80	81	74	64	61	69	72	71	72	73	70	65	71	71	65	58	53	22	27	39	32	32	30	35	28	28	36	36	
Textiles	71	81	79	71	67	61	45	57	55	60	56	70	67	65	65	66	66	50	45	28	19	27	26	18	29	43	47	40	40	
Wood	57	76	74	70	67	84	74	82	66	85	84	75	75	75	75	82	53	59	36	51	53	18	46	29	38	9	53	1	39	
Paper	59	73	73	82	66	73	65	51	35	50	51	61	53	61	61	50	45	53	55	52	39	39	19	22	10	15	20	33	33	
Petroleum	71	81	73	77	45	60	79	72	68	74	77	63	75	70	70	72	68	22	6	22	2	4	9	22	17	16	21	21	21	
Chemical	72	79	77	71	67	60	59	61	48	52	46	55	58	62	62	41	21	43	41	21	23	29	14	13	9	16	24	29	29	
Rubber	74	79	81	72	67	64	54	45	47	48	48	44	61	60	60	48	59	64	46	39	34	30	25	17	11	10	0	24	31	
Mineral	60	66	67	66	60	61	72	76	68	69	68	74	61	60	60	55	46	44	32	30	34	27	15	10	0	6	28	26	26	
Basic metal	80	81	75	72	76	68	69	68	74	61	64	73	75	72	72	59	53	47	37	40	35	29	29	34	14	19	40	35	36	
Fabricated metal	67	78	73	64	71	82	65	50	76	61	63	75	71	69	69	48	47	51	45	21	23	21	28	8	5	30	28	32	32	
Machinery	68	76	73	63	69	52	55	64	59	50	53	61	58	62	62	35	34	35	25	12	19	15	3	5	1	8	7	17	17	
Electronics	76	78	77	78	74	66	71	67	67	71	57	64	56	69	69	40	46	46	34	36	24	35	27	19	19	12	10	6	27	
Motor vehicle	62	69	67	55	56	62	51	56	35	39	43	49	53	54	54	36	37	41	37	42	31	20	37	14	6	4	24	20	27	
Transport equipment	55	57	78	76	58	61	82	91	79	50	52	82	74	69	69	21	17	23	31	46	18	11	18	9	9	2	13	13	18	
Furniture	72	75	81	79	62	71	67	71	63	76	73	83	86	74	74	15	62	46	23	24	14	14	25	6	8	8	21	27	23	
Service	82	85	86	84	83	82	82	83	79	78	72	69	68	79	79	49	61	55	40	26	25	28	26	10	2	5	1	3	25	
Electricity gas water	73	80	75	83	70	70	77	69	87	86	68	66	71	75	75	61	66	34	45	61	28	17	17	49	43	37	41	43	42	
Construction	83	87	87	91	86	89	83	90	88	84	82	82	87	86	86	37	40	35	23	24	12	16	23	5	13	17	14	25	22	
Trade	82	86	90	91	88	91	87	90	87	84	83	77	77	86	86	27	44	39	33	22	19	16	19	9	2	10	7	2	19	
Hotel restaurant	45	78	75	70	81	65	71	64	91	40	45	56	36	63	63	29	56	45	40	45	37	38	39	45	0	9	7	0	30	
Transport service	81	69	60	55	50	71	82	57	59	60	51	49	65	62	62	45	18	10	16	17	8	30	31	22	17	14	8	32	21	
Telecom	77	80	88	89	101	120	95	98	87	76	41	46	55	81	81	53	66	65	41	39	73	78	70	30	43	1	3	8	44	
Financial	84	86	88	83	84	82	83	81	80	83	75	72	65	81	81	68	69	67	48	32	36	32	18	13	0	0	0	0	30	
Business service	78	86	74	78	59	54	74	76	44	43	46	45	57	63	63	34	54	43	28	14	11	38	41	0	1	4	1	7	21	
Ownership																														
Private independent	78	82	84	79	72	68	69	68	64	66	62	64	66	71	71	51	60	61	43	30	21	23	25	12	6	10	12	18	29	
Private group	71	78	75	72	72	72	69	69	68	66	61	65	62	69	69	46	53	46	42	41	34	32	29	22	13	11	17	17	31	
Foreign	69	74	71	63	68	63	64	66	60	53	54	45	62	62	62	31	33	29	26	28	24	16	23	8	6	3	1	0	18	
Government	79	85	83	70	70	80	77	80	79	73	72	76	71	76	76	36	53	41	25	33	18	35	18	20	22	9	18	26	27	

Sources: Prowess database from CMIE, and authors' calculation.

1/ Each category has one-third of the total observation

Table IV.3. Distributions of Firms in the Study: Equity-to-Asset and Debt-to-Asset Ratios
(Ratios of stock variables)

	93/94 94/95 95/96 96/97 97/98 98/99 99/00 00/01 01/02 02/03 03/04 04/05 05/06										Time Series Average						
	Median, Equity-to-Asset					Median, Debt-to-Asset						Average					
Total	15	20	26	27	26	24	24	24	25	26	24	24	23	24	23	23	25
Age	36	39	50	53	45	35	42	37	35	39	49	42	41	39	36	36	36
5-10	23	29	34	37	39	40	44	45	48	46	36	29	28	37	37	37	28
10+	10	14	17	17	18	18	19	20	23	21	22	23	18	35	33	32	30
Size 1/	26	35	52	58	59	57	56	57	60	65	62	63	65	55	55	55	4
Small	13	21	26	27	27	25	25	25	26	28	25	25	25	24	37	34	32
Medium	9	13	14	14	14	13	13	13	12	12	11	11	12	36	35	36	30
Large																	31
Industry																	
Financial	11	17	34	38	43	42	37	35	39	49	42	41	39	36	37	29	17
Nonfinancial	15	21	25	26	25	23	23	23	23	23	21	21	21	22	36	32	32
Mining	20	29	35	36	35	27	27	26	28	29	28	27	25	29	32	31	30
Manufacturing	15	21	24	25	24	22	22	22	21	21	19	18	19	21	37	34	37
Food	10	17	21	20	19	18	17	16	14	15	13	14	14	16	33	35	36
Textiles	15	22	26	28	26	25	25	25	22	22	21	21	20	23	41	41	42
Wood	7	13	18	24	24	21	21	19	21	15	17	28	19	52	50	44	38
Paper	13	18	24	30	28	26	25	24	24	22	22	19	22	36	32	34	32
Petroleum	5	17	24	22	23	21	22	22	21	19	18	21	20	27	25	33	29
Chemical	18	23	28	28	26	24	23	24	24	24	21	20	21	37	34	34	37
Rubber	16	21	31	30	30	29	28	28	28	29	27	27	27	39	36	36	36
Mineral	14	20	21	23	21	21	25	23	23	23	21	20	21	45	40	39	41
Basic metal	18	21	24	24	23	22	21	21	21	22	19	17	18	40	37	38	38
Fabricated metal	13	21	25	24	24	22	20	16	16	16	17	15	18	31	25	30	35
Machinery	11	13	16	16	17	15	17	18	18	19	17	15	15	24	26	26	26
Electronics	15	20	25	25	24	23	24	26	26	25	25	24	22	36	31	31	32
Motor vehicle	14	17	16	16	16	16	17	17	17	15	15	12	13	39	35	35	36
Transport equipment	18	22	20	17	16	17	12	18	19	21	12	17	10	33	25	27	29
Furniture	25	35	40	36	31	27	18	17	17	17	13	14	17	20	23	11	12
Service	12	19	30	33	35	31	31	33	33	38	33	34	34	26	23	18	16
Electricity gas water	16	20	26	27	25	22	22	22	22	23	25	25	25	42	42	34	29
Construction	8	8	14	18	15	13	13	13	14	13	11	11	17	20	23	19	18
Trade	10	19	30	32	30	24	23	24	25	26	22	24	25	21	16	16	16
Hotel restaurant	25	22	34	34	34	31	30	31	33	28	26	23	26	37	29	24	22
Transport service	12	20	20	20	20	21	21	22	23	25	22	25	20	37	32	27	21
Telecom	6	31	31	29	36	38	39	43	34	47	56	58	51	44	13	32	38
Financial	11	17	34	38	43	42	37	35	39	49	42	41	39	37	29	17	11
Business service	24	36	42	49	43	43	51	56	56	55	51	51	48	17	18	13	10
Ownership																	
Private independent	18	26	36	39	38	34	32	32	32	34	30	30	30	35	30	27	26
Private group	13	18	18	18	18	18	19	19	19	17	17	17	18	38	35	36	36
Foreign	12	13	15	15	14	15	17	18	17	19	20	18	17	27	25	25	23
Government	10	11	12	12	12	12	13	12	11	10	12	11	10	35	40	38	34

Sources: Prowess database from CMIE; and authors' calculation.

1/ Each category has one-third of the total observation

Table IV.4. Distributions of Firms in the Study: Foreign Borrowing to Asset Ratio and External Funds Relative to Capital Expenditure 1/

	Average Foreign Borrowing to Asset Ratio										Median External Funds Relative to Capital Expenditure 1/																	
	93/94	94/95	95/96	96/97	97/98	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	Average	93/94	94/95	95/96	96/97	97/98	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	Average
Total	0.4	0.4	0.3	0.3	0.5	0.6	0.5	0.4	0.4	0.4	0.6	1.4	1.6	0.6	0.7	0.9	0.9	0.7	0.7	0.6	0.6	0.6	0.4	0.3	0.5	0.4	0.5	0.6
Age																												
0-5	0.3	0.1	0.2	0.1	0.4	0.4	0.6	0.7	0.8	0.7	0.8	1.3	1.1	0.6	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0	0.7	0.7	0.5	0.9	0.9
5-10	0.4	0.3	0.2	0.3	0.4	0.4	0.4	0.2	0.4	0.3	0.5	1.4	1.8	0.5	0.7	1.0	1.0	0.8	1.0	0.8	0.8	0.8	0.6	0.6	0.5	0.3	0.7	0.7
10+	0.5	0.4	0.4	0.4	0.6	0.6	0.5	0.4	0.4	0.4	0.5	1.4	1.6	0.6	0.5	0.7	0.6	0.5	0.5	0.4	0.4	0.4	0.2	0.4	0.2	0.4	0.4	0.5
Size 2/																												
Small	0.2	0.1	0.0	0.1	0.1	0.1	0.3	0.3	0.2	0.2	0.2	0.6	0.6	0.2	0.9	1.0	1.0	1.0	1.0	0.9	0.9	1.0	0.9	0.9	0.8	0.7	0.8	0.9
Medium	0.1	0.1	0.2	0.1	0.3	0.4	0.3	0.3	0.4	0.3	0.6	1.2	1.2	0.4	0.7	0.9	0.8	0.7	0.7	0.7	0.6	0.5	0.4	0.5	0.4	0.5	0.6	0.6
Large	1.0	0.9	0.7	0.8	1.1	1.1	0.8	0.6	0.6	0.6	0.9	2.4	3.1	1.1	0.4	0.7	0.7	0.4	0.5	0.2	0.3	0.3	0.1	0.1	0.2	0.3	0.4	0.4
Industry																												
Financial	1.0	0.7	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.4	0.4	0.3	0.4	0.6	0.7	0.8	0.6	0.5	0.3	0.6	0.5	0.8	0.7	0.4	0.1	0.0	0.5
Nonfinancial	0.4	0.3	0.3	0.4	0.5	0.6	0.5	0.4	0.4	0.4	0.6	1.7	2.0	0.7	0.7	0.9	0.9	0.7	0.7	0.6	0.6	0.6	0.4	0.3	0.5	0.5	0.5	0.6
Mining	0.8	0.4	0.4	0.2	0.6	0.6	0.7	0.7	0.5	0.4	0.5	1.7	1.6	0.7	0.3	0.9	1.0	0.8	1.0	0.7	0.4	-0.1	0.6	0.4	0.4	0.5	0.5	0.6
Manufacturing	0.3	0.2	0.2	0.3	0.5	0.6	0.4	0.3	0.4	0.4	0.6	2.0	2.2	0.7	0.7	1.0	0.9	0.7	0.7	0.6	0.5	0.6	0.3	0.2	0.4	0.5	0.5	0.6
Food	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.5	1.4	1.3	0.3	0.7	1.0	0.9	0.7	0.6	0.2	1.0	0.9	0.7	0.8	0.9	0.7	0.5	0.7
Textiles	0.0	0.0	0.1	0.3	0.6	0.7	0.4	0.4	0.6	0.5	0.6	3.3	3.3	0.8	1.0	1.1	1.0	0.7	0.8	0.6	0.6	0.2	0.3	0.5	0.6	0.8	0.7	0.7
Wood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.5	1.9	0.8	0.4	0.7	0.9	1.0	0.9	0.4	0.6	0.3	0.8	1.0	0.5	1.1	-0.2	0.9	0.7
Paper	0.3	0.1	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.4	2.6	3.7	0.8	0.7	0.8	0.8	0.8	0.8	0.8	1.0	0.5	0.2	0.4	0.6	0.5	0.4	0.6
Petroleum	0.4	0.3	0.3	1.0	1.4	1.6	1.6	0.5	0.6	0.4	0.1	2.8	3.9	1.1	0.2	0.3	1.0	0.5	0.6	0.6	0.9	0.5	0.5	0.4	-0.5	-0.2	0.8	0.4
Chemical	0.3	0.4	0.2	0.2	0.6	0.7	0.3	0.3	0.3	0.3	0.5	2.0	2.7	0.7	0.7	1.0	0.9	0.6	0.6	0.5	0.4	0.6	0.2	0.1	0.2	0.3	0.5	0.5
Rubber	0.2	0.2	0.3	0.3	0.4	0.6	0.4	0.4	0.5	0.8	0.8	2.1	1.7	0.7	0.9	1.0	1.1	0.8	0.6	0.7	0.6	0.5	0.0	-0.1	0.5	0.4	0.5	0.6
Mineral	0.4	0.5	0.6	0.6	0.4	0.3	0.3	0.4	0.3	0.5	0.5	0.7	1.1	0.5	0.6	0.5	0.5	0.8	0.9	0.7	0.7	0.7	0.4	0.1	0.0	0.1	0.3	0.5
Basic metal	0.6	0.6	0.7	0.6	0.8	0.9	1.0	0.6	0.3	0.4	0.6	2.1	2.1	0.9	0.9	1.0	0.9	0.6	1.0	0.8	0.6	0.7	0.7	0.5	0.7	0.9	0.8	0.8
Fabricated metal	0.0	0.2	0.1	0.1	0.4	0.6	1.2	0.3	0.2	0.1	0.2	2.4	2.7	0.7	0.7	0.8	1.0	0.9	0.4	0.7	1.2	0.6	-0.1	0.3	0.9	0.6	0.7	0.7
Machinery	0.2	0.2	0.1	0.6	0.5	0.2	0.4	0.2	0.5	0.4	1.2	1.3	1.4	0.6	0.0	0.5	0.9	0.6	0.2	0.2	0.0	0.3	0.3	-0.2	-0.2	0.4	0.1	0.2
Electronics	0.4	0.1	0.1	0.3	0.3	0.5	0.5	0.6	0.9	0.7	0.9	1.5	1.2	0.6	0.5	1.0	1.0	0.9	0.7	0.7	0.5	0.8	0.1	0.2	0.2	0.1	0.5	0.6
Motor vehicle	0.2	0.0	0.1	0.5	0.8	1.1	0.5	0.5	0.8	0.5	0.9	1.7	2.7	0.8	0.3	0.6	0.6	0.3	0.2	0.4	0.3	0.4	-0.6	-0.3	-0.2	0.3	0.3	0.2
Transport equipment	0.5	0.0	0.0	0.1	0.5	0.4	0.8	0.8	0.9	0.8	0.6	3.6	6.4	1.2	-0.6	0.6	0.5	0.7	0.6	0.1	-1.0	0.0	0.8	-0.4	-0.6	1.0	0.3	0.2
Furniture	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	3.6	0.4	1.3	2.5	1.3	0.9	2.0	0.6	0.9	1.5	1.2	1.8	0.2	1.0	0.8	1.2
Service	1.0	0.8	0.5	0.4	0.5	0.5	0.5	0.4	0.4	0.3	0.5	0.7	0.8	0.6	0.6	0.8	0.8	0.6	0.6	0.5	0.6	0.6	0.7	0.6	0.6	0.3	0.4	0.6
Electricity gas water	10.9	7.2	5.8	4.3	7.0	7.3	4.1	2.5	1.8	2.3	2.6	2.8	3.1	4.7	0.6	0.7	0.8	0.8	0.6	0.7	0.4	0.7	0.5	0.9	0.5	0.5	0.7	0.7
Construction	0.0	0.0	0.0	0.0	0.1	0.2	0.8	0.7	0.3	0.3	0.3	0.5	0.6	0.3	0.7	1.2	0.8	0.8	0.5	0.9	0.8	0.7	0.6	1.0	1.1	0.5	0.9	0.8
Trade	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.3	0.5	0.4	0.2	0.9	0.9	0.9	0.8	1.0	0.7	0.9	0.9	1.0	0.4	0.8	0.7	0.7	0.8
Hotel restaurant	0.0	0.6	0.5	0.5	1.0	0.8	0.7	0.6	0.5	0.4	1.0	3.6	2.4	1.0	0.2	0.2	0.5	0.3	0.5	0.6	0.6	0.5	0.8	0.6	0.1	0.0	-0.1	0.4
Transport service	4.4	4.6	2.7	2.3	3.1	2.6	2.2	2.5	2.6	1.8	2.4	2.5	4.3	2.9	0.6	0.8	0.3	0.7	0.6	0.8	0.2	0.2	0.2	0.6	0.6	0.3	0.6	0.5
Telecom	0.1	0.0	0.0	0.0	0.3	0.7	1.7	1.5	1.1	0.9	0.9	1.4	1.2	0.8	1.7	0.9	1.0	0.5	1.0	2.0	0.7	0.9	0.6	0.8	0.6	-0.1	0.0	0.8
Financial	1.0	0.7	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.4	0.4	0.3	0.4	0.6	0.7	0.8	0.6	0.5	0.3	0.6	0.5	0.8	0.7	0.4	0.1	0.0	0.5
Business service	0.0	0.1	0.0	0.3	0.4	0.4	0.2	0.1	0.2	0.1	0.1	0.1	0.4	0.2	0.4	0.9	0.6	0.6	0.4	0.2	0.5	0.5	0.6	0.3	0.6	0.2	0.2	0.5
Ownership																												
Private independent	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	1.0	1.2	0.3	0.9	1.0	1.0	0.8	0.8	0.7	0.7	0.7	0.6	0.5	0.6	0.6	0.7	0.7
Private group	0.4	0.4	0.4	0.5	0.7	0.7	0.5	0.4	0.4	0.3	0.5	1.8	2.1	0.7	0.6	0.8	0.7	0.6	0.6	0.5	0.5	0.5	0.4	0.2	0.3	0.3	0.4	0.5
Foreign	0.5	0.7	0.7	0.9	1.2	1.1	1.0	1.0	1.5	1.7	2.6	2.8	3.2	1.5	0.0	0.3	0.6	0.2	0.0	0.3	0.2	0.3	-0.5	-0.9	0.0	0.2	-0.3	0.0
Government	2.2	2.0	1.7	1.3	1.7	1.9	1.8	1.2	1.1	1.3	1.0	1.5	1.6	1.6	-0.1	0.4	0.4	0.3	0.1	0.2	0.2	-0.1	-0.1	-0.7	-0.3	-1.7	-1.6	-0.2

Sources: Prowess database from CMIE; and author's calculation.

1/ (capital expenditure -(internally generated cash))/(capital expenditure. Internally generated cash includes cash flow from operation and change in inventories, receivables, and payables. capital expenditure - internally generated cash amounts to the external funds needed to fill the gap between investment and internal saving.

2/ Each category has one-third of the total observation

Table IV.5. Determinants of External Funds Use in India

This table presents results from regressions using data excluding outliers (firms with external fund ratio falling in largest 5 percentile or lowest 5 percentile). All models are estimated using standard OLS. Heteroskedasticity consistent standard errors are reported in brackets. Dependent variable is percent share of external funds (flow) over total funds. External and total funds includes changes in short term current liabilities. RZ_us is taken from de Sorres et al (2006, shown in Appendix), as a result, the estimation excludes some sectors where RZ_us is not available, most notably, financial sector. Ownership dummy variables are set against private independent companies.

Independent Variables	Dependent Variable: Leverage (External funds in percent of total funds)									
	1993/94–05/06		1999/00–05/06		1993/94–98/99		99/00–2002/03		2003/04–05/06	
RZ_US	-1.472***	-1.293***	-0.187	-0.528	-0.433	-1.083***	-0.318	-0.315	-0.544	-0.071
	[0.436]	[0.485]	[0.545]	[0.579]	[0.349]	[0.416]	[0.787]	[1.065]	[0.541]	[0.635]
Size (log, sales)	2.932***	3.536***	1.038	1.644	2.617***	4.019***	-2.050**	2.797	0.861	1.870**
	[0.765]	[0.824]	[0.690]	[1.233]	[0.716]	[0.809]	[0.886]	[1.837]	[0.613]	[0.894]
Age (log)	-9.07	-15.850*	-19.920*	9.139	-14.535**	-0.853	-32.964**	-28.449	-19.472*	-2.938
	[6.504]	[8.216]	[10.866]	[13.130]	[5.715]	[7.854]	[14.117]	[31.640]	[10.855]	[19.909]
Age (log, square)	0.5	1.516	3.036	-2.884	1.026	-1.202	5.299**	4.031	2.762	0.054
	[1.127]	[1.380]	[1.877]	[2.229]	[1.004]	[1.321]	[2.356]	[4.798]	[1.768]	[3.070]
Profitability (ROA)	-2.445***	-2.596***	0.023	-2.560***	-2.044***	-3.622***	0.248	-3.475***	-0.046	-0.941**
	[0.281]	[0.367]	[0.049]	[0.300]	[0.416]	[0.230]	[0.240]	[0.445]	[0.079]	[0.408]
Asset tangibility	-179.922*	-142.633	-73.655**	-102.291***	-84.931	-105.163*	-113.722*	-146.488**	3.752	18.993
	[54.003]	[108.777]	[29.755]	[38.764]	[66.815]	[59.854]	[41.493]	[69.525]	[24.740]	[38.132]
Market to book ratio		2.162***		2.811***		1.313***		2.132***		1.281**
		[0.631]		[0.645]		[0.474]		[0.789]		[0.634]
Private group (dummy)	-3.544	-8.690***	-6.100**	-10.301***	-0.938	-6.076**	0.982	-6.888	-5.468*	-7.768**
	[2.439]	[2.725]	[3.095]	[3.806]	[2.152]	[2.453]	[3.915]	[5.595]	[2.888]	[3.609]
Foreign (dummy)	-4.478	-11.148***	-10.431**	-10.810**	-3.325	-7.531**	-9.87	-19.006**	-11.339**	-14.133***
	[2.857]	[3.439]	[4.290]	[4.669]	[3.019]	[3.286]	[6.494]	[8.582]	[4.430]	[5.305]
Government (dummy)	-13.669**	-21.077***	-20.243**	-21.582**	-16.780**	-19.873***	18.654*	-12.245	-8.455	-23.294***
	[5.407]	[6.379]	[8.778]	[10.546]	[7.312]	[7.190]	[10.435]	[16.032]	[6.845]	[8.865]
Number of observations	934	427	2128	825	1420	743	2938	972	2906	1371
R-square	0.20	0.23	0.01	0.10	0.18	0.35	0.01	0.08	0.00	0.02

***, **, and * denote significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

Table IV.6. Determinants of Leverage in India, Debt-to-Assets Ratio

This table presents results from regressions using data excluding outliers (firms with dependent variable falling in largest 5 percentile or lowest 5 percentile). All models are estimated using standard OLS. Heteroskedasticity consistent standard errors are reported in brackets. Dependent variable is ratio of debt to total asset where debt only includes long-term borrowing (and does not include current liabilities). RZ_us is taken from de Sorres et al (2006, shown in Appendix), as a result, the estimation excludes some sectors where RZ_us is not available, most notably, financial sector. Ownership dummy variables are set against private independent companies.

Independent Variables	Dependent Variable: Leverage (Debt-to-asset ratio)					
	1993/94–05/06		1993/94–98/99		1999/00–05/06	
RZ_US	0	0.001	0	-0.001	-0.002	-0.001
	[0.002]	[0.002]	[0.001]	[0.002]	[0.002]	[0.002]
Size (log, sales)	0.025***	0.024***	0.024***	0.023***	0.032***	0.039***
	[0.003]	[0.005]	[0.003]	[0.005]	[0.003]	[0.004]
Age (log)	0.029	0.085*	0.019	0.014	0.054	0.128**
	[0.032]	[0.049]	[0.024]	[0.036]	[0.036]	[0.051]
Age (log, square)	-0.012**	-0.020**	-0.010**	-0.009	-0.014**	-0.026***
	[0.005]	[0.008]	[0.004]	[0.006]	[0.006]	[0.008]
Profitability (ROA)	-0.014***	-0.016***	-0.010***	-0.012***	-0.014***	-0.012***
	[0.001]	[0.002]	[0.001]	[0.001]	[0.001]	[0.002]
Asset tangibility	0.559**	1.441***	0.516*	0.687*	0.405***	0.804***
	[0.280]	[0.499]	[0.307]	[0.402]	[0.124]	[0.169]
Market to book ratio		-0.004		-0.004*		-0.006*
		[0.005]		[0.002]		[0.004]
Private group (dummy)	-0.001	-0.039**	0.005	-0.003	-0.002	-0.026**
	[0.010]	[0.016]	[0.008]	[0.012]	[0.009]	[0.012]
Foreign (dummy)	-0.111***	-0.128***	-0.066***	-0.060***	-0.124***	-0.140***
	[0.014]	[0.019]	[0.013]	[0.016]	[0.013]	[0.014]
Government (dummy)	-0.098***	-0.135**	-0.080***	-0.052	-0.128***	-0.207***
	[0.027]	[0.052]	[0.025]	[0.049]	[0.023]	[0.034]
Number of observations	934	414	1423	735	2133	838
R-square	0.32	0.38	0.24	0.27	0.31	0.32

***, **, and * denote significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

Table IV.7. Determinants of Foreign Borrowing Use in India

Results under "All" column show estimates using data with all firms. Results under "Access" column show estimates using data of firms that have access to foreign borrowing. A firm is defined to have access to foreign borrowing if stock of foreign debt is positive in the sample. All models are estimated using standard OLS. Heteroskedasticity consistent standard errors are reported in brackets. Dependent variable is stock of foreign debt in percent of the stock of total external resources (including debt, current liabilities, and equity capital). RZ_us is taken from de Sorres et al (2006, shown in Appendix), as a result, the estimation excludes some sectors where RZ_us is not available, most notably, financial sector. Ownership dummy variables are set against private independent companies.

Dependent Variable: Foreign Debt in Percent of Total Assets												
Independent Variables	1993/94–05/06				1993/94–98/99				1999/00–05/06			
	All		Access		All		Access		All		Access	
RZ_US	-0.071**	-0.012	-0.199**	-0.124	-0.055**	-0.029	-0.376*	-0.367	-0.007	0.035	-0.01	-0.023
	[0.033]	[0.056]	[0.080]	[0.109]	[0.028]	[0.046]	[0.209]	[0.250]	[0.037]	[0.053]	[0.110]	[0.109]
Size (log, sales)	0.406***	0.626***	0.257	0.341	0.410***	0.653***	-1.937	-6.473	0.255***	0.604***	-0.269	0.161
	[0.072]	[0.146]	[0.225]	[0.299]	[0.068]	[0.154]	[3.536]	[4.142]	[0.040]	[0.094]	[0.286]	[0.211]
Age (log)	-0.35	0.731	-1.358	-0.419	-0.619	-1.119	-3.167	-6.416	-0.991	-2.453	-9.415	-8.637**
	[0.684]	[1.260]	[1.984]	[2.852]	[0.571]	[1.154]	[3.793]	[5.862]	[1.507]	[2.470]	[6.198]	[3.747]
Age (log, square)	-0.006	-0.183	0.084	-0.025	0.078	0.16	0.326	0.903	0.074	0.274	1.226	1.094*
	[0.112]	[0.218]	[0.323]	[0.476]	[0.105]	[0.214]	[0.652]	[0.955]	[0.231]	[0.375]	[0.954]	[0.561]
Profitability (ROA)	-0.006	-0.011	-0.023	0.031	-0.016*	-0.027	-0.158	0.08	0	0.029	-0.055	0.168**
	[0.010]	[0.053]	[0.041]	[0.130]	[0.008]	[0.025]	[0.117]	[0.234]	[0.001]	[0.024]	[0.055]	[0.078]
Asset tangibility	3.316	15.137***	6.31	31.876***	7.327***	9.690**	109.750**	117.723***	0.718	3.88	2.16	5.497
	[4.458]	[5.245]	[7.565]	[12.047]	[2.505]	[4.332]	[29.642]	[37.173]	[1.814]	[3.323]	[11.686]	[10.939]
Market to book ratio		-0.063		0.084		-0.153**		-0.305		0.015		0.098
		[0.125]		[0.274]		[0.068]		[0.324]		[0.061]		[0.228]
Exporter (dummy)	0.123	0.361	0.244	0.474	0.026	-0.052	0.062	-1.902	-0.034	-0.01	-0.42	-0.337
	[0.235]	[0.335]	[0.676]	[0.671]	[0.201]	[0.268]	[1.763]	[1.439]	[0.161]	[0.241]	[0.605]	[0.570]
Private group (dummy)	-0.09	-0.19	-0.543	-0.408	0.006	-0.136	-0.857	-0.135	0.399**	0.177	0.666	0.276
	[0.201]	[0.438]	[0.670]	[0.910]	[0.137]	[0.283]	[2.057]	[2.850]	[0.189]	[0.346]	[0.818]	[0.762]
Foreign (dummy)	-0.018	-0.788*	0.287	-1.289	0.118	0.462	-1.937	-6.473	0.705	-1.147***	2.23	-1.952**
	[0.450]	[0.471]	[1.190]	[1.099]	[0.283]	[0.448]	[3.536]	[4.142]	[0.594]	[0.338]	[1.808]	[0.911]
Government (dummy)	0.906	-1.13	1.621	-1.515	1.214	-1.158	-1.937	-6.473	0.423	-0.287	2.048	-0.042
	[0.910]	[1.181]	[1.987]	[2.006]	[1.065]	[0.921]	[3.536]	[4.142]	[0.447]	[0.816]	[1.657]	[1.471]
Number of observations	1040	434	347	192	1578	765	177	123	2363	872	553	312
R-square	0.06	0.08	0.05	0.04	0.05	0.05	0.06	0.09	0.03	0.08	0.08	0.11

***, **, and * denote significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

Table IV.8. Determinants of External Funds Use in India

This table presents results from regressions using data excluding outliers (firms with dependent variable falling in largest 5 percentile or lowest 5 percentile). All models are estimated using standard OLS. Heteroskedasticity consistent standard errors are reported in brackets. Dependent variable is ratio of equity to total asset where equity is only includes long-term borrowing (and does not include current liabilities). RZ_us is taken from de Sorres et al (2006, shown in Appendix), as a result, the estimation excludes some sectors where RZ_us is not available, most notably, financial sector. Ownership dummy variables are set against private independent companies.

Independent Variables	Dependent Variable: Ratio of Equity to Total Assets					
	1993/94–05/06		1999/00–05/06		1993/94–98/99	
RZ_US	0.005***	-0.001	0.006***	0.004**	0.004***	0.001
	[0.002]	[0.002]	[0.002]	[0.002]	[0.001]	[0.002]
Size (log, sales)	-0.013***	-0.011**	-0.043***	-0.047***	-0.008***	-0.011***
	[0.003]	[0.005]	[0.003]	[0.004]	[0.002]	[0.004]
Age (log)	-0.053*	-0.140***	-0.140***	-0.261***	-0.070***	-0.108***
	[0.029]	[0.047]	[0.038]	[0.071]	[0.021]	[0.033]
Age (log, square)	0	0.018**	0.007	0.032***	0.001	0.010*
	[0.005]	[0.008]	[0.006]	[0.011]	[0.004]	[0.005]
Profitability (ROA)	-0.004***	-0.004***	-0.001	-0.007***	-0.002***	-0.003***
	[0.001]	[0.001]	[0.000]	[0.001]	[0.001]	[0.001]
Asset tangibility	0.044	-0.311	-0.342	-1.378***	-0.177	-0.133
	[0.297]	[0.372]	[0.254]	[0.240]	[0.275]	[0.243]
Market to book ratio		-0.002		0.007***		-0.005*
		[0.003]		[0.002]		[0.002]
Private group (dummy)	0.005	0.012	-0.007	0.008	-0.012*	0
	[0.009]	[0.012]	[0.009]	[0.011]	[0.007]	[0.010]
Foreign (dummy)	0.029**	0.045**	0.048***	0.061***	-0.004	0.019
	[0.013]	[0.018]	[0.016]	[0.019]	[0.011]	[0.015]
Government (dummy)	0.043**	0.017	0.094***	0.134***	0.008	-0.032
	[0.019]	[0.027]	[0.022]	[0.022]	[0.017]	[0.020]
Number of observations	934	407	2130	820	1422	725
R-square	0.26	0.17	0.35	0.44	0.25	0.23

***, **, and * denote significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

Table IV.9. Determinants of Firm Growth

This table presents results from regressions using data excluding outliers (firms with firm growth rate falling in largest 5 percentile or lowest 5 percentile). All models are estimated using standard OLS. Heteroskedasticity consistent standard errors are reported in brackets. Dependent variable is annual average growth rate of firm gross value added within each sample period. RZ_us is taken from de Sorres et al (2006, shown in Appendix), as a result, the estimation excludes some sectors where RZ_us is not available, most notably, financial sector. Initial share of a firm is calculated as a share of the firm's gross value added to the sum of gross value added across all firms as of the first year of the sample period. Ownership dummy variables are set against private independent companies.

Independent Variables	Dependent Variable: Annualized Average Growth of Gross Value Added					
	1993/94–05/06		1999/00–05/06		1993/94–98/99	
RZ_US	-0.417***	-0.632***	-0.357***	-0.733***	-0.027	-0.373*
	[0.113]	[0.146]	[0.138]	[0.166]	[0.162]	[0.195]
Initial share	0.609	0.062	1.512	-4.920	1.19	-2.354
	[1.096]	[1.536]	[2.224]	[3.475]	[1.942]	[1.833]
Age (log)	-2.216***	-2.262***	-2.493***	-1.471**	-3.200***	-3.631***
	[0.355]	[0.469]	[0.440]	[0.609]	[0.450]	[0.630]
Profitability (ROA)	0.700***	0.860***	0.070*	0.927***	0.572***	1.051***
	[0.070]	[0.104]	[0.039]	[0.099]	[0.147]	[0.116]
Leverage	0.056	0.159*	0.075***	0.109	0.016	0.375***
	[0.050]	[0.089]	[0.029]	[0.080]	[0.033]	[0.097]
Market to book ratio		0.261		0.688		0.371
		[0.206]		[0.422]		[0.307]
Access to foreign debt (dummy)	2.188***	1.817**	2.631***	1.174	2.731**	3.294***
	[0.533]	[0.705]	[0.712]	[0.885]	[1.081]	[1.194]
Exporter (dummy)	-0.802	-0.929	-0.284	-1.065	0.607	-0.246
	[0.515]	[0.665]	[0.632]	[0.803]	[0.718]	[0.882]
Private group (dummy)	-0.352	-0.813	-0.931	-1.670*	2.138***	1.422
	[0.603]	[0.874]	[0.686]	[0.947]	[0.819]	[1.156]
Foreign (dummy)	0.041	-1.806	3.370***	-2.931**	2.240*	0.856
	[0.816]	[1.161]	[1.144]	[1.429]	[1.282]	[1.662]
Government (dummy)	-1.334	-1.533	-1.105	-1.575	3.385	3.953
	[1.451]	[2.090]	[1.704]	[2.744]	[2.164]	[3.073]
Number of observations	867	394	1919	801	1297	678
R-square	0.32	0.32	0.05	0.19	0.15	0.24

***, **, and * denote significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

Appendix Table IV.1. Industries' Dependence on External Finance (U.S.)

Industry	ISIC/NIC Code	Our Indicator	Dependence on External Finance
Wood and products of wood and cork	20	Wood	-0.45
Fabricated metal products except machinery and equipment	28	Fabricated metal	-0.25
Construction	45	Construction	-0.19
Other nonmetallic mineral products	26	Mineral	0.0
Pulp paper, paper products, printing and publishing	21-22	Paper	0.09
Electricity, gas, and water supply	40-41	Electricity, gas, water	0.12
Machinery and equipment n.e.c.	29	Machinery	0.19
Textiles, textile products, leather, and footwear.	17-19	Textile	0.19
Other transport equipment	35	Transport equipment	0.19
Motor vehicles, trailers and semi-trailers	34	Motor vehicle	0.2
Transport and storage	60-63	Transport service	0.43
Basic metals	27	Basic metal	0.44
Food products, beverages and tobacco	15-16	Food	0.53
Rubber and plastics products	25	Rubber	0.56
Hotels and restaurants	55	Hotel restaurant	0.64
Wholesale and retail trade, repairs	50-52	Trade	0.75
Coke refined petroleum products and nuclear fuel	23	Petroleum	0.78
Electrical and optical equipment	30-33	Electronics	1.62
Post and telecommunications	64	Telecom	1.67
Real estate renting and business activities including computer and R&D services	70-74	Business service	3.35
Chemicals and chemical products	24	Chemical	6.2

Source: de Serres, et al (2006)

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V. DEVELOPING THE FOREIGN EXCHANGE DERIVATIVES MARKET—THE CASE OF INDIA¹

A. Introduction

1. **Currency derivatives can provide important benefits for financial systems.**² The sound management of currency risk is one of the most critical elements of adapting financial systems to greater globalization in order to preserve financial stability. Like other types of derivatives, foreign exchange derivatives facilitate risk diversification, promote efficient price formation, and enhance financial intermediation. They supplement cash markets, improve market liquidity, and facilitate the unbundling, decomposition and/or transformation of risk, which can be customized to risk preferences.
2. **Currency derivatives markets are particularly important for countries like India that have flexible exchange rates and are moving towards fuller capital account convertibility.** In the context of a flexible exchange rate, well-functioning derivatives markets help reduce financial fragility by allowing the corporate and financial sectors to better manage their exchange rate risks, ease financial surveillance, and provide useful price signals about market views on economic and financial conditions. Currency derivatives also complement the development of domestic capital markets.
3. **This chapter proceeds as follows.** It first analyzes the present development of currency derivatives markets in India. It then reviews current market reforms. The chapter concludes by considering policy measures to promote the benefits of foreign currency derivatives markets while mitigating attendant risks.

B. Current Situation

4. **The origins of India's foreign exchange markets can be traced back to 1978, when banks were permitted to undertake intra-day currency trades for the first time.** However, market activity did not take off until after the adoption of a managed-floating exchange rate regime in March 1993 amid a series of ongoing financial and capital market that followed the recommendations of the Report of the High Level Committee on Balance of Payments. The gradual relaxation of capital account restrictions provided an economic rationale for the creation of onshore currency derivatives markets as corporates started tapping foreign markets.
5. **Amid India's growing global financial integration, domestic currency derivatives trading has tripled since 2004 to nearly US\$34 billion per day.** The rupee's share in

¹ Prepared by Andreas Jobst, MCM-CD.

² A “derivative” is a financial contract whose value derives from one or more underlying reference assets, such as securities or market indices, with settlement at a future date.

global turnover of traditional foreign exchange products (cash, spot and forward derivatives market)³ more than doubled between 2004 and 2007 to 0.7 percent of global turnover (or US\$26 billion per day)—remarkable given the 70 percent annual growth in global trading during recent years. Moreover, the share of global foreign exchange trading taking place in India (not all involving the rupee) also more than doubled to 0.9 percent of global trading.

6. **Despite the surge in currency derivatives trading, it lags that in other major emerging economies.** For example, it remains small compared to South Korea, Mexico, or South Africa (see Figures V.1 and V.2), which have registered similar increases in capital inflows and rising domestic exchange rate exposures. At end-2007, the daily gross volume of currency derivatives turnover represented less than 20 percent of all foreign exchange trades in India.

7. **Foreign-currency transactions in India occur mostly over-the-counter (OTC), with the Clearing Corporation of India Ltd. (CCIL) acting as settlement agent** (it settles 90–95 percent of the interbank transactions in the U.S. dollar-rupee market). The daily average gross volume of interbank trades in the U.S. dollar-rupee currency pair has increased from US\$6–7 billion in 2006 to about US\$11–12 billion in 2007. The peak volume settled on a single day was US\$39 billion in 2006 and US\$67 billion in 2007.⁴

8. **Inter-bank currency swaps account for the largest share of currency derivatives turnover.** Hedging can be performed through swaps and OTC inter-bank forward or option contracts—both cross-currency as well as foreign currency/rupee. Turnover in forward (US\$2.5 billion daily) and swap contracts (US\$3.1 billion daily) represent about 90 percent of gross daily derivatives trading. Since the issue of foreign exchange swaps and options by corporates and institutional investors is restricted to long positions to hedge demonstrated exposure, trading in nontraditional instruments (swaps and options) essentially reflects inter-bank transactions (Mohan, 2007).

9. **Options trading remains nascent, with trading around US\$400 million daily.** Authorized dealers (ADs) were allowed to trade foreign currency/rupee options only since July 7, 2003, when the Reserve Bank of India (RBI) expanded the spectrum of hedging products for currency exposure. ADs can offer “plain vanilla” European options and customers can purchase call or put options. As in the spot and forward markets, customers who have legitimate foreign currency exposures are eligible to enter into options contracts but cannot write options. ADs can use options to hedge trading books and balance sheet exposure.

³ Spot and derivatives.

⁴ About 50 percent of the CCIL-settled volume constitutes spot trades, while the remainder is accounted for by swap contracts (cash vs. TOM (tomorrow) or cash vs. forward).

10. **In terms of trading book values, short-term forward contracts claim the largest share of the derivatives market.** As of end-August 2007, total foreign exchange contracts outstanding in the banks' balance sheets amounted to US\$1.1 trillion, of which 84 percent were forwards and the rest swaps and options. Despite the steady increase in foreign exchange market liquidity, trading has been mainly concentrated in short-term instruments with maturities of less than one year (see Gambhir and Goel, 2003, and Figure V.3). One-fifth of all currency trades settled at the CCIL are forward contracts⁵, including forward contracts in swap agreements (see Figures V.4 and V.5). Forward contracts are generally traded to month-end value dates and involve smaller notional volumes than cash/spot markets, where deal sizes are two and a half times larger than in the forward market. A high netting factor⁶ reduces actual settlement flows to less than ten percent of overall volume, thereby limiting settlement risks.

11. **Registered foreign banks and domestic public sector banks are the main players in an increasingly concentrated forward market** (see Figure V.6). They account for more than 90 percent of demand and more than 87 percent of supply of forward contracts. Concentration is increasing, with the top 20 entities increasing their share from 73.6 percent in 2004 to 83.8 percent at end-September 2007. This situation could reflect restrictions on market access: foreign institutional investors (FIIs), investors through inward foreign direct investment (FDI), and nonresident Indians (NRIs) can access the forward market and are permitted to hedge currency risk only to the extent of their cash market exposure (equity and/or debt).⁷

12. **Onshore currency trading is subject to increased competition from offshore trading.** Amid limits on full capital account convertibility and on foreign market participation, currency derivatives trading activity is springing up offshore. In June 2007, the Dubai Gold and Commodities Exchanges started trading of rupee futures, while liquidity in the nondeliverable forward (NDF) market has been growing noticeably, allowing nonregistered foreign investors and Indian corporates to hedge their rupee exposure. However, despite rising liquidity, offshore trading is still only about a quarter of onshore trading. Moreover, offshore derivatives activity is mainly in short-term transactions.

⁵ The daily turnover of forwards is similar to stock futures, the most frequently traded, noncurrency derivative asset class.

⁶ The netting factor denotes the reduction of individual fund obligations (arising from every trade) to a single net fund obligation after multilateral offsetting of all outstanding positions.

⁷ For FDI investors, forwards are permitted to hedge exchange rate risk on (i) the market value of investments made in India since January 1, 1993 (ii) dividends receivable on the investments in Indian companies, and (iii) proposed investment in India.

C. Regulatory Framework and Proposed Reforms

13. **The currency derivatives market is regulated by the RBI, which issued comprehensive guidelines on derivatives in April 2007.**⁸ To alleviate legal uncertainty about cash-settled OTC derivatives, the RBI Act was amended in October 2006 to define the regulatory purview of RBI over derivatives (with interest rates, foreign exchange rates, credit ratings/credit indices, or securities prices as underlying assets) if one of the transacting parties is a scheduled bank or other entity regulated under the RBI Act, Banking Regulation Act or Foreign Exchange Management Act (FEMA). In the wake of the Annual Policy Statement for the Year 2007–08 (April 2007), the RBI adopted a new regulatory framework for derivatives, which defines: (i) a classification of market participation into market makers, who undertake derivatives transactions to act as counterparties, and users, who undertake derivatives transactions to hedge or transform risk exposure; (ii) broad principles for undertaking derivatives transactions, including valuation and market pricing; (iii) prudential measures to control the risks in derivatives activities, including an integrated risk management process; and (iv) “suitability” and “appropriateness” of policies governing the due diligence of market-makers in offering derivative products.

14. **Against the background of growing financial integration and benign macroeconomic conditions, the RBI is liberalizing foreign exchange markets as a critical element of continued capital market development.** Based on recommendations of the Technical Advisory Committee on Money, Foreign Exchange and Government Securities Markets, the RBI has taken steps to further broaden and deepen financial markets in line with real sector developments and phased capital account liberalization. In the past, capital account restrictions have been maintained in order to preserve financial and economic stability. However, given India’s increasing financial integration and the high level of foreign exchange reserves, the RBI is now easing certain restrictions, which renders greater importance to the efficiency of foreign exchange and currency derivatives trading (as discussed in the recommendations of the 2006 report of the Tarapore Committee on Fuller Capital Account Convertibility (CFCAC)).

15. **Regulatory efforts are underway to widen the domestic derivatives market, with a view to facilitating onshore currency hedging in India.** Reforms in the currency derivatives market have followed the FEMA, which calls for development of orderly foreign exchange markets with a view to meeting both development and stability objectives. For example, in April 2007, the RBI published supervisory guidelines on derivatives. The new rules propose *inter alia* the permissibility of various types of derivative instruments, in particular, currency futures, in the effort move currency derivatives trading to organized

⁸ The RBI is also the official supervisory authority for interest rate and credit derivatives.

exchanges.⁹ In addition, the RBI has proposed several initiatives to simplify procedures in the conduct of currency derivatives transactions (especially regarding the use of forwards and options) and is exploring other hedging instruments, which would allow market participants greater flexibility to undertake foreign exchange operations and risk management practices.

16. The RBI recent raised hedging limits for documented exposures as the first measure in series of regulatory reforms. As part of the comprehensive guidelines on derivatives adopted in April 2007, corporates are permitted to reinstate eligible hedging limits upon both declaration of (anticipated and economic) exposure and past performance criteria (if supporting documentation is produced during the term of the hedge undertaken).¹⁰ For SMEs, the RBI has simplified procedural hedging requirements by waiving complex documentation formalities.¹¹ Similarly, individuals have been permitted to hedge up to US\$100,000 on self-declaration basis.

17. The RBI may require banks to exercise greater caution when engaging in hedging activities on behalf of corporate clients. In December 2007, the RBI announced that it might tighten the norms for currency derivatives as banks and companies are facing losses from exchange rate positions. In an effort to enhance market surveillance of derivatives trading, banks will be required to ascertain the risk management usage of currency derivatives, which would include documentation of corporate clients' risk management practices and approval from senior management.

18. The RBI also plans to expand option-based hedging facilities available to firms. The RBI proposes to allow importers and exporters having foreign exchange exposure to sell covered call and put options in both foreign currency/rupee and cross-currency ("dynamic hedging"). Currently, corporates are allowed only to purchase options on a stand-alone basis as "users." Only in zero-cost structures are corporates permitted to write options. Since corporates cannot be net sellers, they would need to enter simultaneously into an offsetting sell option, which generates a similar amount of premium income. In contrast, the new regulations would remove this constraint and allow premium income. In addition, exporters will be allowed to use American options (relaxing the restriction to European options), which

⁹ However, according to current proposals, the use of currency swaps by corporates is limited to hedging purposes for genuine long-term foreign currency exposures only. Market participants express concerns that the new regulation hampers some existing products, such as swaptions and short-term currency derivatives corporates use to hedge their currency exposures. Currently, 30–40 percent and 25 percent of existing currency hedging occurs within the one– to three–year basket respectively.

¹⁰ Moreover, the process of booking cancellation and rebooking of forward contracts has been improved, and exporters and importers are also allowed to book forward contracts based on past performance.

¹¹ Hedging facilities can only be offered by banks that maintain an ongoing credit relationship with the SME and should be commensurate with the turnover of the SME.

allow them to square off their positions any time until maturity upon receipt of export earnings. Proposed measures also call for greater scrutiny of exotic structures used by companies for speculative gains rather than for hedging their exposures.

19. **At the same time, the RBI is reviewing existing guidelines and supervision standards for derivatives.** Following the Mid-term Review of Annual Policy for the year 2006–07, the RBI plans to intensify supervision of banks' exposure to derivatives beyond the annual inspection cycle and off-site monitoring through specified returns. OTC trading in currency derivatives could pose operational and credit risks related to trade confirmation, margining, and contract enforceability, which in turn could create systemic vulnerabilities in the absence of mutual risk-sharing mechanisms and prudential standards that maintain market integrity and limit externalities from counterparty default (see Box V.1). The proposed supervisory oversight structure for enhanced market surveillance includes stress testing of banks' derivatives portfolios, particularly in view of banks resorting to multilateral netting of counterparty exposures in OTC markets, which are currently not subject to a supervisory process for settlement.

20. **The RBI's plans to revamp general supervision of derivatives complement efforts to move currency derivatives trading to organized exchanges.** In 2006, the CFCAC had recommended that currency futures be introduced to enable market participants to better manage currency risk exposures, with risks contained through a more formal trading mechanism, structure of contracts, and regulatory environment. Following the Annual Policy Statement for the Year 2007–08 (April 2007), the RBI appointed an Internal Working Group on Currency Futures to study the international experience of exchange-traded currency derivatives (mostly in OECD countries) and suggest a suitable market structure consistent with the current legal and regulatory framework. The working group issued its draft report on November 15, 2007, recommending trading in currency futures on dedicated exchanges, with diversified ownership structure and market participation limited initially to resident entities only. The report also assigns supervisory responsibility to the RBI.

D. Analysis of Proposed Reforms

Greater Hedging Flexibility

21. **The latest move by the RBI to allow greater flexibility of hedging activities is a step in the right direction, but whether it will spark much wider participation in currency derivatives markets remains a question.** Current changes to documentation and exposure limits are expected to incrementally improve the flexibility of larger exporters to use hedging techniques. However, smaller participants might lack the expertise and may require other solutions, such as retail-friendly market access and centralized trading platforms for greater price transparency.

22. **While more flexible use of options could help complete the derivatives market, it could also encourage hedging strategies that result in capital inflows.** The current

configuration of exchange rate expectations in India results in more long-hedgers than short-hedgers,¹² which makes it difficult to complete derivatives markets. In this situation, the only way for all the long buyers to find short sellers is for speculators or arbitrageurs to take contrarian positions in the market, but such trading is limited by current regulations. Thus, hedgers would need to create synthetic long local currency positions to lay off the risk of taking short positions, creating temporary capital inflows.¹³ Creating a synthetic long position would involve (i) borrowing in a depreciating currency abroad, (ii) exchanging the funds into rupee in the spot market, and (iii) investing in rupee-denominated assets domestically. Such a money market hedge increases demand for external borrowing and temporarily inflates capital inflows (until the hedge is unwound). While RBI's plans to allow hedgers to receive premium from writing covered call and put options could increase the supply of much needed short positions, the tendency to hedge these positions (or to speculate) determines the effect on capital inflows.

Introduction of Currency Futures

23. **Both OTC and exchange-based trading forums may be needed for the development of a well-functioning foreign exchange market, provided that they are supported by adequate infrastructure.** Plans to introduce currency futures markets should recognize the importance of a well-functioning electronic settlement and clearing system for effective monitoring of trading activity and efficient execution of trades, asset diversity, and a broad investor base. In particular, reaping the full benefits of foreign exchange derivatives requires careful management of risks arising from the mode of trading (see Box V.1).

24. **OTC markets are essential for exporters and importers who need to hedge specific cash flows in a customized fashion.** The bulk of currency trading in emerging markets occurs in OTC markets. However, OTC markets can also involve specific risks, including poor record keeping by intermediaries and inadequate arrangements for dealing with counterparty credit and settlement risk. In volatile environments, the disorderly unwinding of positions in OTC markets could be destabilizing. Customized products may also be costly and may shift excess risk to end users.

25. **Exchange-based markets may be needed for institutional investors seeking to manage wholesale positions.** More generally, derivatives trading without central clearing counterparties and full disclosure could raise system-wide vulnerabilities. Such vulnerabilities must be managed through appropriate prudential regulation and supervision of

¹² The term "long" refers to an investment position that is equivalent to holding the local currency. "Long" is what one owns or buys, and "short" is what one owes or sells.

¹³ This assumes that dealers maintain a flat (neutral with respect to exchange rate risk) or nearly flat book of positions.

market participants, sound structuring and regulation of exchange-based trading, margin requirements, position and exercise limits, centralized clearing and settlement, mark to market requirements, market surveillance, mutualization of risks through loss-sharing arrangements, and capital deposits of members and international excess-of-loss insurance.

26. **At the current stage of development, an exchange-traded currency derivatives market usefully complements the growing OTC market in India.** Existing OTC derivatives trading in India lacks the centralized risk management and inherent transparency of exchanges. Exchange-based trading platforms can increase transparency, while measures for greater disclosure can provide additional information of importance to users, such as (i) enhanced monitoring and supervision of credit exposures, trading positions, and market movements, and (ii) prescriptive standards for internal risk management (credit and operational risk) based on real-time market monitoring of credit exposures, trading positions, and market movements to reduce information asymmetries.

27. **The introduction of exchange-based currency derivatives in the form of currency futures would broaden demand for hedging facilities and increase transparency in foreign exchange markets.** Currency futures contracts enhance price discovery in the spot market and improve the efficiency of OTC derivatives markets (forwards, options, and swaps) by providing pricing benchmarks and liquidity management facilities. The existing currency forward market is opaque and concentrated in interbank trading with high transaction charges. The migration of currency markets to exchanges will also allow automated trading strategies to establish high market efficiency and better-functioning spot and derivatives markets on currencies as well as interest rate and credit risks, integrated by arbitrage and liquid trading.

28. **Existing trading platforms in the equity market could be an alternative to creating separate currency futures exchanges.** The proposal to create dedicated exchanges should be assessed against the merits of adopting the design and risk management standards of stock exchanges in India. While fixed income trading in the government securities market is well advanced and could support futures trading through centralized clearing and settlement in compliance with the “Lamfalussy Standards,”¹⁴ a centralized limit order book with an electronic order matching—as in equity markets—might prove even more useful for currency trading, which involves large order flows for a few asset classes.¹⁵

¹⁴ The “Lamfalussy Standards” of the European Central Bank define six minimum standards for the design and operation of cross-border, multi-currency netting schemes or systems (see <http://www.ecb.int/home/glossary/html/glossm.en.html>).

¹⁵ The National Stock Exchange (NSE) offers an electronic order book with open access for financial firms and retail customers, and the elimination of counterparty risk via the National Securities Clearing Corporation (NSCC) as central clearinghouse.

29. **Separate currency futures exchanges would fail to harness the economies of scale and scope of India's established stock exchanges.** India's stock exchanges already have economies of scale, and currency futures trading could be woven into the existing infrastructure at low cost. Moreover, the trading platforms of both BSE and NSE, coupled with internet trading, would allow transparent market access at low cost through the country.

30. **Market participation during the initial phase of currency futures trading might be narrow.** According to the current proposal, only a standardized product will be offered across various exchanges (in terms of contract size, final settlement dates, settlement procedure, tenors, etc.) to encourage proper price discovery and facilitate retail participation. Although foreign institutional investors (FIIs) claim the lion's share in domestic foreign exchange markets, the RBI intends to limit market access to residents in the initial phase, after which participation is expanded to include two categories of residents outside India—FIIs and NRIs—but only as hedgers through designated banks, subject to position limits.

31. **The proposed regulations are ambiguous about the participation of domestic institutional investors and might fail to create complementary hedging interest.** In existing currency derivatives markets in India, the exclusion of institutional investors (barring a few exceptions) limits counterparty lines and longer-term contracts. However, a broad and balanced investor base for genuine hedging is critical for effective derivatives markets.¹⁶ For example, commercial banks with short-term liabilities and long-term fixed-rate assets, and institutional investors with long-term liabilities, have complementary term structures, and therefore make natural counterparties in derivatives markets.

32. **Recent experiences of other countries provide some perspective on market participation and trading infrastructure of currency futures markets.** In June 2007, South Africa debuted foreign exchange futures trading on the Johannesburg Stock Exchange, allowing investors to trade rand futures in a regulated market for the first time. South Africa's experience has informed many elements of the proposed implementation guidelines, such as the minimum contract size of US\$1,000 for retail investors, limited product diversity¹⁷ and a greater retail focus than other currency derivatives markets. That said, there are several significant differences as regards market participation and trading infrastructure. Although the Internal Working Group on Currency Futures recommends that no quantitative restrictions may be imposed on residents to trade in currency futures, it is silent on the market participation of institutional investors. In South Africa, institutional investors are

¹⁶ Along with flaws in security design, limits on market access were a main cause of the unsuccessful 2003 launch of interest rate futures in India.

¹⁷ The futures market in South Africa started with U.S. dollar/rand trading, adding Euro and pound sterling at a later date.

subject to the foreign allocation allowance¹⁸, and corporates need a special permission from the central bank to participate. In addition, currency futures in South Africa are traded separately using the same infrastructure as the existing interest rate exchange.

E. General Policy Implications

33. **India's commitment to greater capital account openness requires broader and deeper financial markets, including greater availability and flexibility of currency hedging facilities.** Developing currency derivatives markets with greater size, diverse product profiles, and enhanced infrastructure would be crucial to provide domestic entities with the tools they need to manage the risks associated with an open capital account. In this connection, early steps to strengthen financial supervision and gradual financial liberalization can complement the development of currency derivatives markets. In Australia, for example, there was an initial period of exchange rate volatility following the liberalization of the forward markets, though the market matured soon (see Box V.2). While an earlier strengthening of supervision and more cautious steps in liberalizing transactions could have eased the macroeconomic side effects, the speed of development of the financial markets, in particular those for hedging, would likely have been slower.

34. **Development of currency derivatives markets would likely cause the offshore market to wither.**¹⁹ This would not necessarily be problematic, as by nature, offshore nondeliverable forward (NDF) markets are difficult to regulate fully and are less transparent than onshore markets. Moreover, given higher transactions costs, they are less useful to smaller investors.

35. **The current regulatory framework for hedging activities would need to allow two-sided markets to develop, with a diverse and balanced investor base.** Regulatory guidelines should be flexible enough to establish symmetry of the demand for hedging and the supply of risk protection through counterparty lines, in transparent markets and with low barriers to entry for small investors. Policies should allow participants in the market to sell derivatives and encourage foreign participation. Regulators should allow short sales and fails, and allow market participants to take positions without having the underlying security.

36. **Establishing greater transparency and improving the infrastructure of OTC currency derivatives markets will facilitate the introduction of currency futures.** Many prudential mechanisms of derivatives exchanges are now being used in OTC derivatives

¹⁸ Pension funds and insurance companies are subject to a 15 percent foreign allocation allowance, in line with exchange control regulations. Asset managers and registered collective investment funds are limited to a 25 percent foreign allocation.

¹⁹ In Poland, for example, when foreign exchange swap operations were liberalized in 1998, a deep domestic swap market developed quickly, squeezing out the vibrant offshore NDF market for zloty in London.

markets, most notably requiring collateral and allowing only highly rated entities to engage in OTC transactions, using close-out netting for central, multilateral clearing and settlement (which limit the risk that a defaulting counterparty will demand payment on contracts that are in his favor while refusing to pay those on which he owes money), and copying disclosure practices used for futures markets. Other measures include: (i) central counterparties with strong risk management systems, including capital rules and collateral requirements (for example through margining) as well as membership rules, (ii) the promotion of intermediaries as both market makers providing two-way quotes and settlement agents collecting and paying the financial obligations, and (iii) market provisions that limit externalities from the default of a systemically important counterparty.

Box V.1. Over-the-Counter (OTC) vs. Exchange-Traded Derivatives (ETD)—the Most Salient Differences

All exchange-based trading of derivatives is governed by rules designed to ensure market stability and financial integrity for the purpose of safeguarding the collective interest of market participants. While orderly market rules and prudential measures govern conduct, mutualize risk, and impose limits on leverage and margining, formalized risk management regulations on the soundness, disclosure, and transparency of individual positions, limits and transactions promote investor protection and ensure market integrity against the threat of manipulation when supplies of underlying assets are limited (IMF, 2000).^{1/}

In contrast, OTC derivatives are traded in an informal network of bilateral relationships without (i) formal centralized limits on individual positions, leverage, or margining, (ii) collective risk—and burden sharing, and (iii) prudential rules or mechanisms to ensure market stability and integrity. The operational aspects trading, clearing and settlement are decentralized and credit risk management is located within individual institutions. Counterparties prefer to deal only with highly rated and well capitalized intermediaries to minimize counterparty risk. The concentration of OTC derivatives in major financial institutions entails lower transaction cost and information asymmetries than ETD. Although OTC instruments are essentially unregulated, they are affected indirectly by national legal systems, regulations, banking supervision and market surveillance. Nonetheless, the absence of formal requirements of disclosure and limits on positions and trades does not bode well for the preservation of collective interest in times of stress.

The flexibility of contract structures in OTC markets cuts both ways. While OTC trading can be efficiency enhancing as participants deliberately choose the upside potential of lower transaction cost and customization over the downside risk of contract failure in bilateral transactions, lightly and only indirectly regulated trading is also prone to induce financial instability and may trigger system-wide failures. That said, the benefit of OTC depends on how market participants manage some of the most acute risks from the absence of centralized clearing, such as (i) difficulties in the complete elimination of confirmation backlogs, (ii) deficient post-default settlement protocols, and (iii) the prospect of market risk from multiple defaults that could overwhelm the existing settlement infrastructure and undermine the efficacy of risk transfer in general.

There are practical means to curb concerns about systemic vulnerabilities in OTC markets through the introduction of centralized mechanisms for the mitigation of counterparty risk. Remedial prudential standards to improve the stability of OTC markets aim at the prevention of manipulation and coordination failure, such as the introduction of the widely accepted ETD market practice of “circuit breakers” and price limits for trading, as well as requirements of OTC dealers to act as market makers by maintaining binding bid and offer quotes throughout the day to prevent dealers from market withdrawal at times of stress.

^{1/} Note, however, that the risk of manipulation in OTC markets is limited by the extent to which contracts serve a price discovery role as do ETDs.

Box V.2. The Australian Experience of Developing Foreign Exchange Derivatives Markets

Prior to floating the Australian dollar in December 1983, the exchange rate policy was underpinned by a comprehensive system of exchange controls on the capital account. There was little demand for hedging. Forward markets were only allowed on trade-related transactions. Most of the capital account transaction risk was transferred to the central bank. The NDF market developed out of the necessity to manage risk from increased volatility of major currencies in early 1970s (IMF, 2005).

Establishment of the government securities market underpinned the development of money markets, which, together with a liberalization of foreign portfolio investment in 1980, laid the foundation for a well functioning currency market. In a preparatory step, restrictions on trading in the forward market were eased in October 1983, which helped to deepen trading in advance of the float.

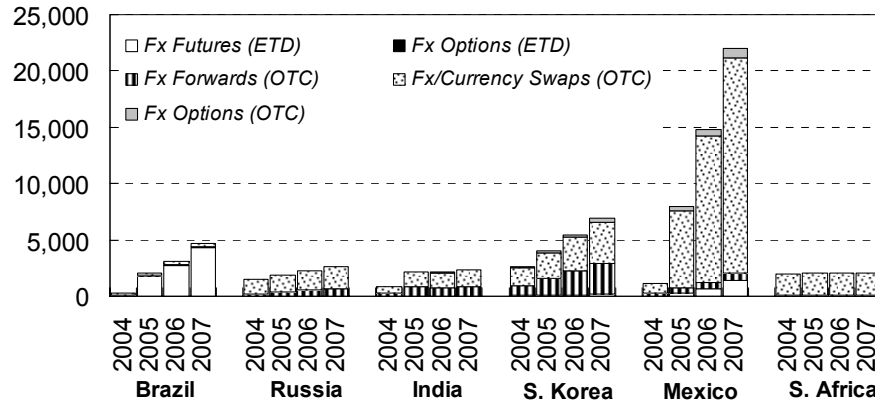
The subsequent floating of the Australian dollar made it possible to liberalize capital flows and the financial system. A lesson from the Australian experience suggests that strengthening bank supervision earlier in the process would have been useful (Australian Treasury, 2003). Perhaps more gradual liberalization of the capital account and the financial system could have eased the macroeconomic side effects, but the development of key financial markets, such as those in currency hedging instruments, would likely have slowed.

Currency hedging is now extensive, reducing vulnerability to exchange rate fluctuations. Private sector experience with a floating currency reinforced by corporate disclosure requirements and prudential regulations, increased demand for hedging instruments to manage foreign exchange risk. Markets in these instruments have become deep, with turnover in forwards, swaps, and derivatives being 2½ times that in the spot market (BIS, 2005).

In 2001, Australia introduced derivatives regulations as part of an exhaustive regulatory overhaul of the entire financial services sector according to the Wallis Inquiry.^{1/} The principal purpose of this reform was to introduce uniform licensing and disclosure requirements for the provision of all financial products, including derivatives, within Australia. A generic legislative definition of derivatives has been adopted, bringing within the scope of this regulation, all derivatives transacted within Australia, regardless of the nature of the parties to the derivatives transaction and whether the derivatives have been transacted on an exchange or in the over-the-counter markets.

1/ In 1997, the so-called Wallis Inquiry recommended the creation of a flexible and effective regulatory structure that would inter alia address how financial innovation and expanding consumer needs are changing the financial system of Australia. By 2001, many of its recommendations have now been implemented. As a result of those recommendations new institutions have been created or already established institutions have been reorganized. APRA is one such new institution created to regulate the financial services industry sector of Australia.

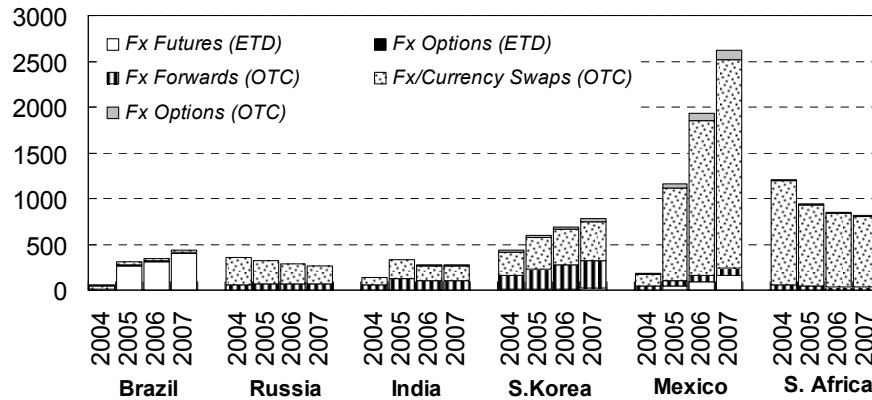
Figure V.1. Fx Derivatives Markets in Selected EM Countries 1/
 (Annual trading volume, notional amounts in billions of U.S. Dollars)



Sources: World Federation of Exchanges; Bank for International Settlements; and IMF, *World Economic Outlook*; and staff estimates.

1/ OTC and ETD trading data for 2007 is estimated. OTC data for the years 2005 and 2006 are interpolated based on historical trends.

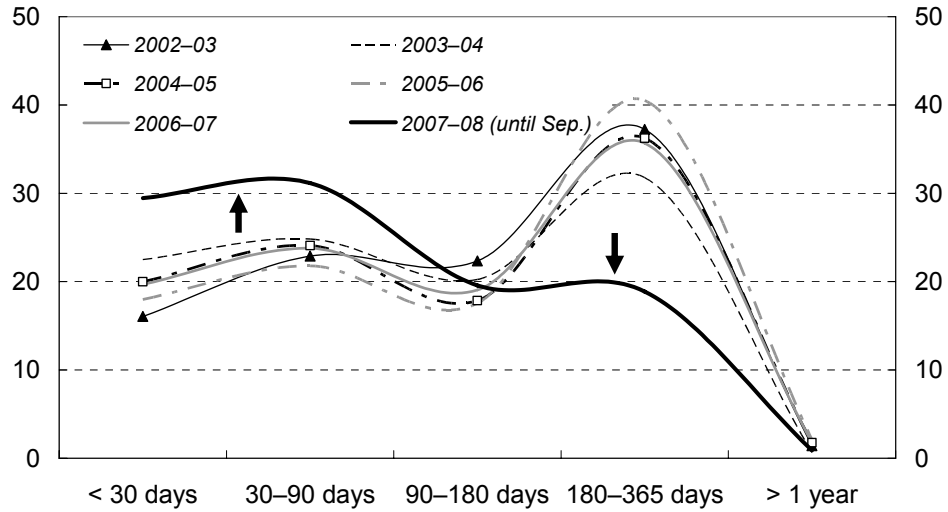
Figure V.2. Fx Derivatives Markets in Selected EM Countries 1/
 (Annual trading volume relative to GDP, in percent)



Sources: World Federation of Exchanges; Bank for International Settlements; and IMF, *World Economic Outlook and staff estimates*.

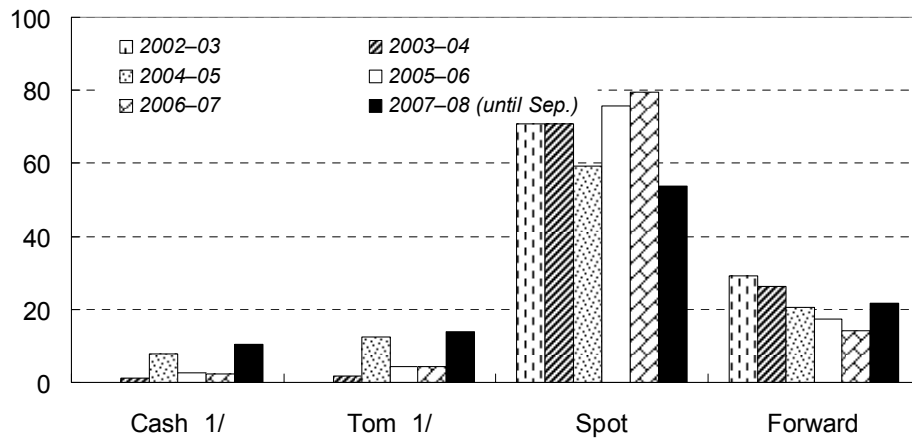
1/ OTC and ETD trading data for 2007 is estimated. OTC data for the years 2005 and 2006 are interpolated based on historical trends.

Figure V.3. India: Tenorwise Settlement of Forward Fx Trades
(Share, in percent of total value)



Source: Clearing Corporation of India Ltd.

Figure V.4. India: Analysis of Traditional Fx Trades by Trade Type
(Share, in percent of total value)

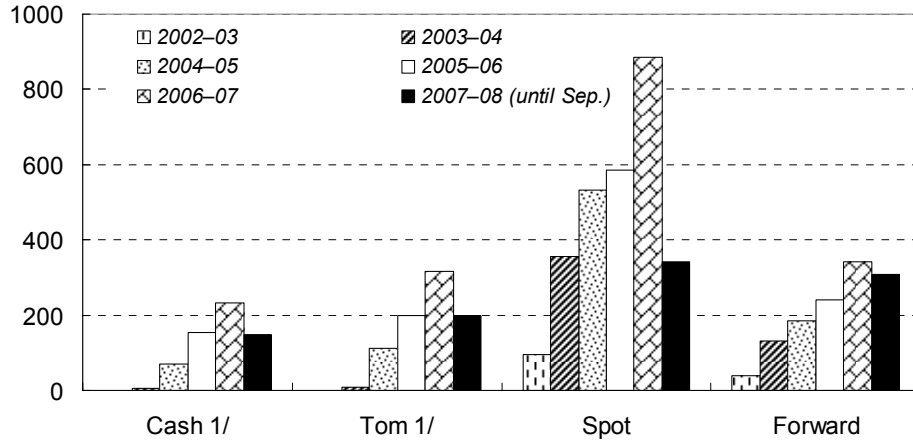


Source: Clearing Corporation of India Ltd.

1/ Cash and Tom settlements with effect from February 2004. Spot figures are inclusive of spot leg of swaps.

Figure V.5. India: Analysis of Traditional Fx Trades by Volume

(Annual volume, in billions of U.S. Dollars)

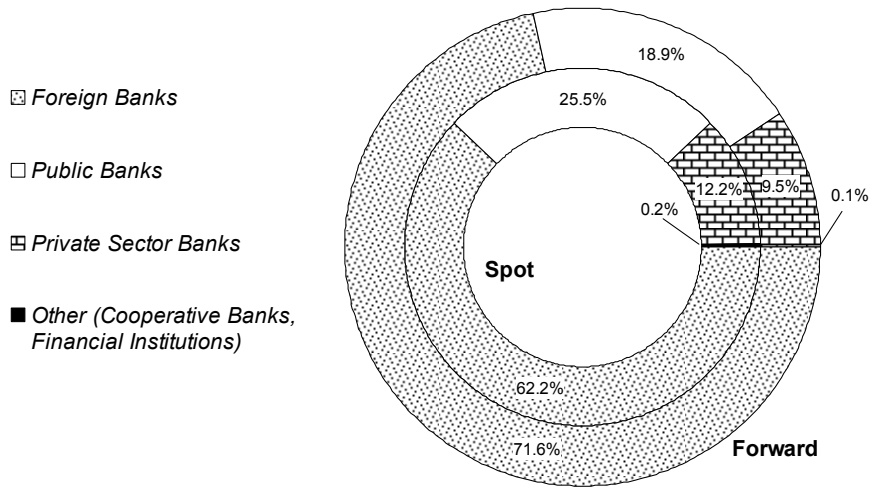


Source: Clearing Corporation of India Ltd.

1/ Cash and Tom settlements with effect from February, 2004. Spot figures are inclusive of spot leg of swaps.

Figure V.6. India: Analysis of Fx and Forward Trades by Category

(As of end-October 2007, buy-side)



Source: Clearing Corporation of India Ltd.

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VI. INCLUSIVE GROWTH¹

A. Introduction

1. **“Faster and more inclusive growth” is the centerpiece of India’s 11th Plan (2007–2012).** India is enjoying a period of unprecedented growth, with real GDP rising at over 8 percent per year for the past 4 years, making it one of the world’s fastest growing economies. Yet, India still has the largest concentration of poor people in the world. The extent to which India’s poor have been able to take up the opportunities provided by an expanding economy and contribute to its expansion is an important question for the well-being of millions. It is also at the heart of the current political debate in India. Decisive reforms are required to ensure continuing economic growth, yet the ability of the government to pass and sustain reform momentum depends on popular support. If large parts of the populations are left behind, even if only in relative terms, the viability of future reforms may be threatened.

2. **This paper aims to document the extent to which Indian growth has benefited the bottom of the income distribution over the last two decades.** Did the impressive growth performance translate into commensurate poverty reduction? How did growth and changes in inequality contribute to poverty reduction? Did the pattern of growth across the income distribution change as India’s economic expansion accelerated? Was the inclusiveness of growth across Indian states influenced by certain factors or policies such as financial development, education or labor legislation?

B. Growth, Poverty, and Inequality in the Last Two Decades

3. **National income accounts and household survey data paint somewhat different pictures of the improvement in living standards over the last two decades.** The annual growth rate of real GDP per capita accelerated from about 3 percent in 1983–1993/94 to an average of 4½ percent in the post reform period 1993/94–2004/05.² A similar pattern is observed in private per capita consumption, as measured in national account statistics (NAS). Household survey data point to a substantially slower improvement in consumption per capita (Table VI.1).

4. **Over the same time period, the incidence of poverty fell by nearly 20 percentage points.** As of 2004/05, 25¾ percent of people in urban areas and 28 percent

¹ Prepared by Petia Topalova.

² These particular periods were chosen based on availability of household survey data. NSS quinquennial rounds were conducted in 1983, 1987/88, 1993/94, 1999/00, and 2004/05. Due to the substantial differences in the measurement of per capita expenditure in the 1999/00 round, most of the analysis will not rely on data from this round.

of people in rural areas lived below the poverty line.³ Poverty depth decreased by more than 50 percent during this time period.

5. **Overall consumption inequality increased in the 1990s, particularly in urban areas, and within almost all states according to a variety of measures.** While inequality was stable (in urban India) and declining (in rural India) in the 1980s, this trend was reversed in the 1990s. As real consumption growth was significantly higher in urban areas, the urban-rural gap widened. The change in the distribution of consumption across households can explain the lower than expected poverty reduction. Despite the pick-up in consumption growth rate from the 1980s to the 1990s, the decline in poverty incidence remained roughly unchanged: the poverty rate fell by 9.4 percentage points (or 20.8 percent) in the 1983–1993/94 period and 8.4 percentage points (or 23.4 percent) during the slightly longer 1993/94–004/05 period.

6. **Anecdotal evidence suggests that wealth inequality may be even higher.** Ahya and Sheth (2007) estimate that India has witnessed an increase in wealth of over 100 percent of GDP in the past four years from three key sources: the equity market, the residential property market, and gold (see also Purfield, 2007). With 4-7 percent of the population participating in the stock market, 47 percent of the population owning a ‘pucca’ house, and the top 34 percent of households holding 71 percent of the value of consumer durables (including gold and jewelry), it is likely that the bulk of wealth accretion was concentrated within a very small segment of the population (Ahya and Sheth, 2007).

7. **How much more or less poverty reduction might have been achieved had growth occurred without changes in the income distribution?** To examine this, changes in poverty can be decomposed into the change attributable to “pure growth” (holding inequality constant) and the change attributable to the distributional component (holding the mean of consumption constant).⁴ To do so, we express the poverty rate at time t as a function of the level of consumption, m_t , and the distribution of income or the Lorenz curve, l_t , i.e. $P_t = P(m_t, l_t)$. We adopt the methodology proposed by Dhongde (2007), which provides a path-independent and complete decomposition, by taking the average of the two growth components (with distribution kept fixed as in time $t=0$ and $t=1$), and the average of the two distribution components (with average consumption held fixed at $t=0$ and $t=1$), namely:

$$P_{11} - P_{00} = \frac{(P_{10} - P_{00}) + (P_{11} - P_{01})}{2} + \frac{(P_{10} - P_{11}) + (P_{00} - P_{01})}{2}$$

³ The poverty line is defined in India as the minimum subsistence income that can support the consumption of 2400 calories in rural areas and 2100 calories per person in urban areas.

⁴ For a similar decomposition for earlier time periods, see Jain and Tendulkar (1990), Datt and Ravallion (1992), Deaton and Dreze (2002), Bhanumurthy and Mitra (2004) and Dhongde (2007).

where $P_{00} = P(m_0, l_0)$ and $P_{11} = P(m_1, l_1)$. This simple decomposition abstracts from the fact that changes in the distribution of income may affect (and be affected by) the average growth rate (i.e. the observed growth rate may not have been the same had the distribution of income not changed).

8. **The counterfactual simulation suggests that in the 1980s, changes in the distribution of income enhanced the effect of growth on poverty reduction** (Table VI.4). In rural India, poverty reduction from “growth alone” would have been 27 percent lower had the distribution of income not changed in favor of the poor. In urban India, “growth alone” accounts for the entire poverty decline.

9. **In the period from 1993 to 2004/05, on the other hand, changes in the distribution of consumption moderated the extent to which growth reduced poverty.** Distribution-neutral growth would have generated a poverty decline in rural India that was 22 percent higher; in urban areas, the decline in poverty would have been 76 percent higher. This finding suggests a marked change in the way the gains from growth were distributed across India’s households in the relatively new market-oriented framework governing India’s economic life.

C. Inclusiveness of Growth

10. **To gain a fuller picture of how the absolute gains from growth accrue across the income distribution, we calculate “growth incidence curves” of real monthly per capita consumption (Ravallion and Chen, 2003).** The growth incidence curve depicts how the growth rate for a given quantile varies across quantiles ranked by expenditure, thus succinctly describing how inclusive growth was. A growth incidence curve increasing over all quantiles implies rising inequality, while a downward-sloping curve characterizes growth that was biased towards the poor. Figure VI.1 presents the growth incidence curves for India, during the 1983–1993/94 and 1993/94–2004/05 period⁵. The top panel uses data for all India, the middle for urban India, and the bottom for rural areas. The annualized growth rate in the mean (horizontal solid line) and median (horizontal dashed line) incomes are also included as benchmarks.

11. The shift in the growth patterns of consumption across the income distribution is striking - in almost all states growth became less equalizing in the 1990s. From 1983 to 1993/94, growth in consumption at the bottom of the income distribution outpaced growth at the top, especially in rural India (Figure VI.2). In urban areas, growth was remarkably distribution-neutral. As India launched market-oriented reforms in 1991 and overall growth

⁵ These calculations use the disaggregate household survey data from 1983, 1993/94 and 2004/05, with household expenditures adjusted to be comparable across states, and rural and urban areas and deflated to 1993/94 values using the official deflators of the Planning Commission.

accelerated, the shape of the growth incidence curve reversed, with far faster growth at the top than the bottom. In fact, though aggregate growth was significantly higher in the 1990s (even when measured in NSS data), the bottom 50 percent of India's population experienced faster consumption growth in the previous decade. Similar to the previous period, there was a substantial difference between the experience of urban and rural areas, with a stronger pro-rich bias of growth in urban areas.

12. **While growth incidence curves describe distributional changes well, a simple summary statistic is useful for making comparisons over time and across states, and for statistical analysis.** How might the inclusiveness of growth be defined? The authorities' definition, "a growth process in which people in different walks in life... feel that they too benefit significantly from the process,"⁶ suggests using a measure that captures the unevenness in consumption growth rates across households. We therefore define inclusiveness, or "pro-poor bias of growth" as the difference between the consumption growth rate of the poorest 30 percent and richest 30 percent of the population.^{7,8}

13. **We use variation across India's states and over time to establish the relationship between the inclusiveness of growth, the growth rate and its sectoral composition.** Specifically, we compute for each of the 15 large states in India and for each of the following periods, 1983–1987/88, 1987/88–1993/94 and 1993/94–2004/05, the inclusiveness of growth as defined above, the average annual growth rate of real state GDP per capita, as well as the per capita growth rates of the agricultural, industrial and service sector. We then regress the inclusiveness of growth on per capita growth rates (Table VI.5). We include period fixed-effects to control for economy-wide changes, and state fixed-effects to control for time-invariant heterogeneity across states.

14. **There is no evidence of correlation between the speed of growth and its inclusiveness, however the sectoral composition matters.** Faster growth in services is associated with a larger gap between the consumption growth of the poor and the rich, in favor of the rich. The service sector includes a mix of activities that may be of varying importance to the bottom as well as the top of the income distribution. A finer disaggregation of the services sector reveals that, just as expected, the observed negative correlation is driven by the expansion of the banking and insurance sector within the services sector, which employs predominantly highly educated people. Thus, while service growth is associated with absolute gains by the poor, the results indicate that it is associated with even more

⁶ Ahluwalia, Montek, Deputy Chairman of the Planning Commission. Business Standard June 29, 2007.

⁷ Given the nature of the policy debate in India, this seems to be a more appropriate definition than for example the standard deviation of growth rates, or other measures that describe the unevenness of growth.

⁸ The choice of 30 percent is arbitrary, and as a robustness check, we analyze the difference in the growth rates between the bottom and top 10 percent, 20 percent, and below and above the median.

benefits to the people at the top of the income distribution. For broader definitions of inclusiveness of growth, such as the difference in growth below and above the median, higher growth of the secondary/industrial sector is correlated with a larger pro-poor bias of consumption growth, presumably because of the lower threshold of skills and education for employment in manufacturing and construction.

D. The Role of Policy for Inclusiveness of Growth

15. **Why has economic growth been less inclusive in some states than others?** Do economic policies affect how the benefits of growth are distributed across households? A large literature has analyzed the heterogeneity of the Indian experience to examine why and how certain Indian states have experienced faster growth and poverty reduction than others (for a survey, see Besley, Burgess, and Esteve-Volart, 2007). Few have explored what affects the distribution of growth across households. Building on the previous work, we consider here whether factors that have been shown to be associated with the growth and poverty reduction experiences of India's states are also related to the distributional impact of growth. More importantly, these are all policies that have been highlighted as crucial for making growth faster and more inclusive in the Approach Towards the 11th Plan Paper of the Planning Commission of India.

16. **Numerous studies have argued that labor regulations are an important determinant of the investment climate in India.** The Industrial Disputes Act, which governs hiring and firing of labor in manufacturing was initially passed at the central level, but state governments were given authority to amend it. Besley and Burgess (2004) classify these amendments as pro-worker, pro-employer or neutral and demonstrate that labor regulations significantly affect manufacturing performance across Indian states. In particular, additional labor protection led to lower growth in manufacturing employment. A similar conclusion is reached by Ahsan and Pages (2007), who find that laws that increase job security or increase the cost of labor disputes substantially reduce registered sector employment, without increasing the labor share.

17. **A second factor that may play an important role is access to finance.** Credit may enable people to move out of agriculture into higher-earning activities, such as organized manufacturing or certain types of self-employment. In India, Burgess and Pande (2005) found that the rural bank branch expansion program of 1977–90 significantly lowered rural poverty and increased nonagricultural output. While financial development may boost growth, its effect on the distribution of growth across households is less clear. We measure financial development of Indian states as the log of total real credit per capita.

18. **A third factor considered is secondary education.** In the approach to the 11th Plan, the Planning Commission envisions a stronger focus on secondary, higher and technical education to promote faster and more inclusiveness growth. Empirical evidence of the importance of human capital for economic growth across the world abounds. In the Indian

context, Trivedi (2002) finds that for the period 1965–1992, secondary school enrollment rates are positively and significantly related to economic growth across Indian states. We thus look at the share of a state population with secondary education and above as a measure of human capital.

19. Access to infrastructure is also considered one of the key constraints to growth.

Kochhar et al. (2006) show that states with higher quality infrastructure enjoy higher GDP growth and faster growth in industrial sectors. However, they do not consider whether infrastructure affects the distribution of income. Infrastructure at the state level is measured as the main factor from a principal component analysis of installed electricity capacity per capita, kilometers of surfaced roads per state area, and share of households with access to drinking water.

20. Finally we verify whether states' revenue expenditures on social services are associated with more inclusive growth. Social services include health, education, water supply, housing, urban development, nutrition and various welfare schemes for economically disadvantaged groups. As the majority of these services are targeted to poorer households, one might expect the inclusiveness of growth to be positively correlated with states' social spending.

21. A panel regression framework is adopted, using measures of the inclusiveness of growth across several time periods for each state, to investigate whether the above variables are correlated with the distributional patterns of growth. By exploiting the variation both across states and over time, the framework controls for any time invariant state characteristic, such as preferences for equality, natural resource endowment etc. that may be somehow correlated with both policies and patterns of growth and thus obfuscate cross sectional studies.⁹ We thus estimate:

$$y_{t,t-l,s} = \alpha + \beta X_{t-l,s} + \gamma Z_{t-l,s} + \tau_t + S_s + \varepsilon_{t,s}$$

where $y_{t,t-l,s}$ is a measure of the inclusiveness, or pro-poor bias, of growth in state s between year t and $t-l$ (The three periods considered are 1983–1987/88, 1987/88–1993/94 and 1993/94–2004/05 periods). Inclusiveness is measured as the difference between the consumption growth rate of the bottom 30 and the top 30 percent of the population (different cutoffs are also considered). $X_{t-l,s}$ is a vector of state-level policy variables described above at the beginning of the time period. Since many of these variables could potentially be correlated with the overall level of development of a state, we control for a set of initial characteristics $Z_{t-l,s}$: the log of income per capita (measured as the real net state domestic product per capita) and the number of people involved in agriculture as a share of the total

⁹ This is in contrast to previous studies that have focused on explaining the relationship between policies and growth elasticity of poverty reduction across states in a single cross-section (Besley, Burgess and Esteve-Volart, 2007) or looked at the correlation of this elasticity with initial state characteristics (Datt and Ravallion, 2002).

workforce. Finally, τ_t and S_s represent period and state fixed effects. The necessary data are available for 15 major states in India (comprising 95 percent of India's population in 2004).

22. **Several interesting relationships emerge from the data (Table VI.6).**

- Higher financial development is significantly associated with more pro-poor growth. This relation is consistent with the idea that better access to credit enables people in the bottom of the income distribution to move out of agriculture into higher-earning activities, such as organized manufacturing or certain types of self-employment.
- There is some evidence that labor regulations, intended to protect workers from exploitation by factory owners, in fact reduced the relative gains of the poor. While the point estimate is not statistically significant in column (2), once other policy measures are controlled for, the absolute value of the coefficient increases and it is consistently statistically significant. As states amend their regulations towards greater flexibility for the employer, the poor seem to benefit more in terms of consumption growth.
- As a larger share of the population completes secondary education, growth becomes relatively more pro-poor. The correlation may stem from the fact that a larger supply of skilled labor eases the pressure on wages at the top of the income distribution.
- There is also evidence that better infrastructure is associated with more inclusive growth. There does not appear to be a statistically significant correlation between state expenditures for socioeconomic purposes (such as health, education etc.) and the distribution of growth rates across households.

23. **The above exercise points to the ability of economic policy to influence how the benefits of growth are distributed across the income distribution, though the results should be interpreted with caution.** As in most macro-level analyses that lack exogenous variation, it is only possible to identify conditional correlations, rather than causal relationships. Additionally, there could be unobserved, state-specific time varying factors that affect both the pattern of growth and the policies or outcomes we identify. The causality could run in both directions: for example socioeconomic spending may be particularly high in some states because growth is not inclusive.

E. Conclusion

24. **While many have celebrated India's accelerating economic growth, others have expressed concern about the distributional impacts of the growth process.** Cognizant of the vulnerability of its large population below poverty, India's authorities have made faster and more inclusive economic growth the primary goal of their development strategy. Decades of rapid growth have led to a dramatic reduction in poverty in rural and urban India, with millions of households escaping from poverty, and similarly dramatic declines in

measured poverty depth. There is every reason to believe that economic growth will continue to lead to declines in poverty.

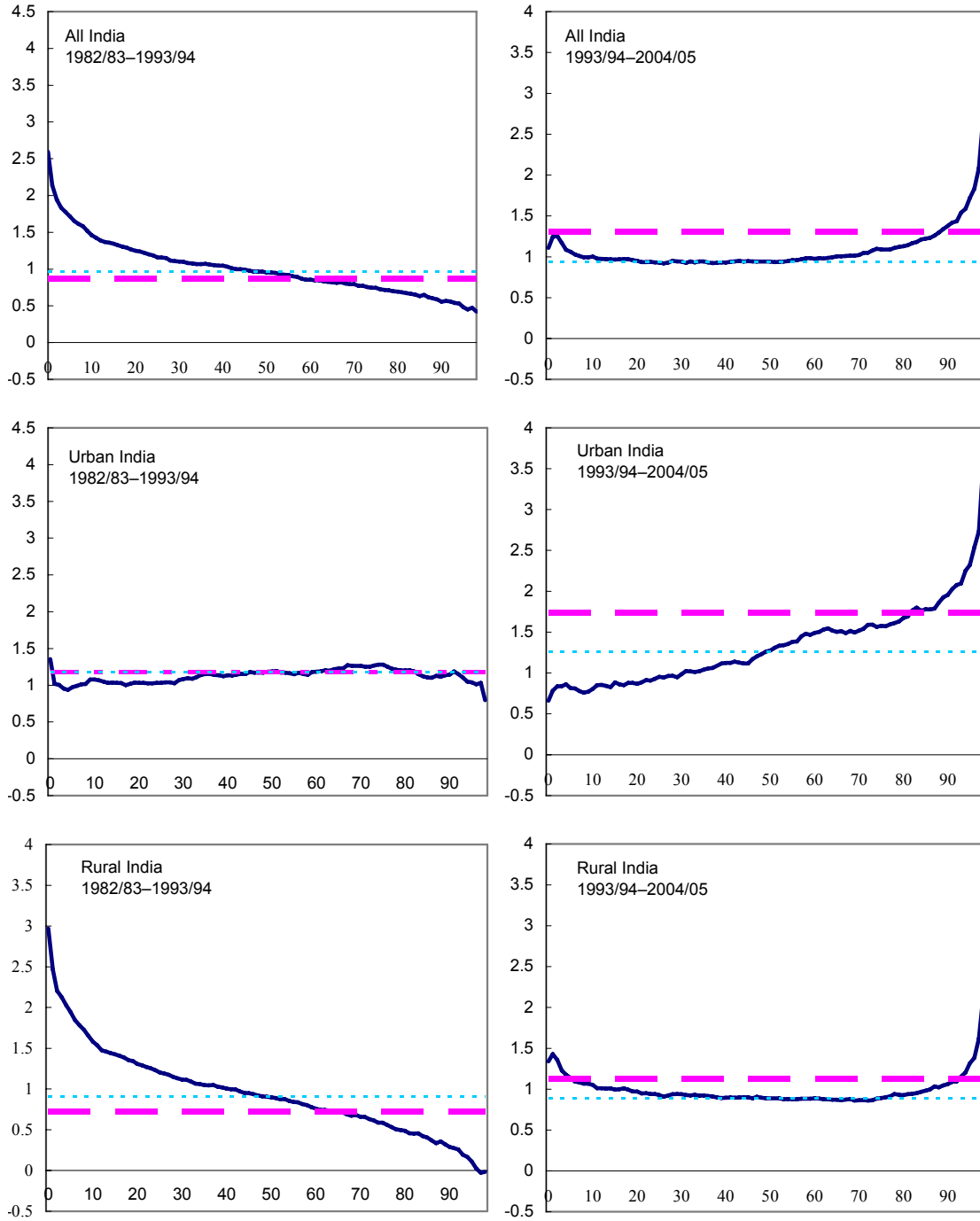
25. As India adopted a market-oriented model of development, there was a marked shift in the way the benefits of growth were distributed across the income distribution.

In the 1980s, the growth rate of consumption of the bottom of the income distribution was substantially higher than that of the top. In contrast, in the 1990s, the top of the population enjoyed a substantially larger share of the gains from economic growth compared to the previous decade. This had significant effects on income inequality, which grew within states, across states, and between rural and urban areas.

26. There is indicative evidence that economic policies can influence how the benefits of growth are distributed. States with higher financial development, more flexible labor markets and higher human capital raised the ability of the poor to gain from the growth process. Improving infrastructure may also lead to a growth process that is more inclusive of the poor.

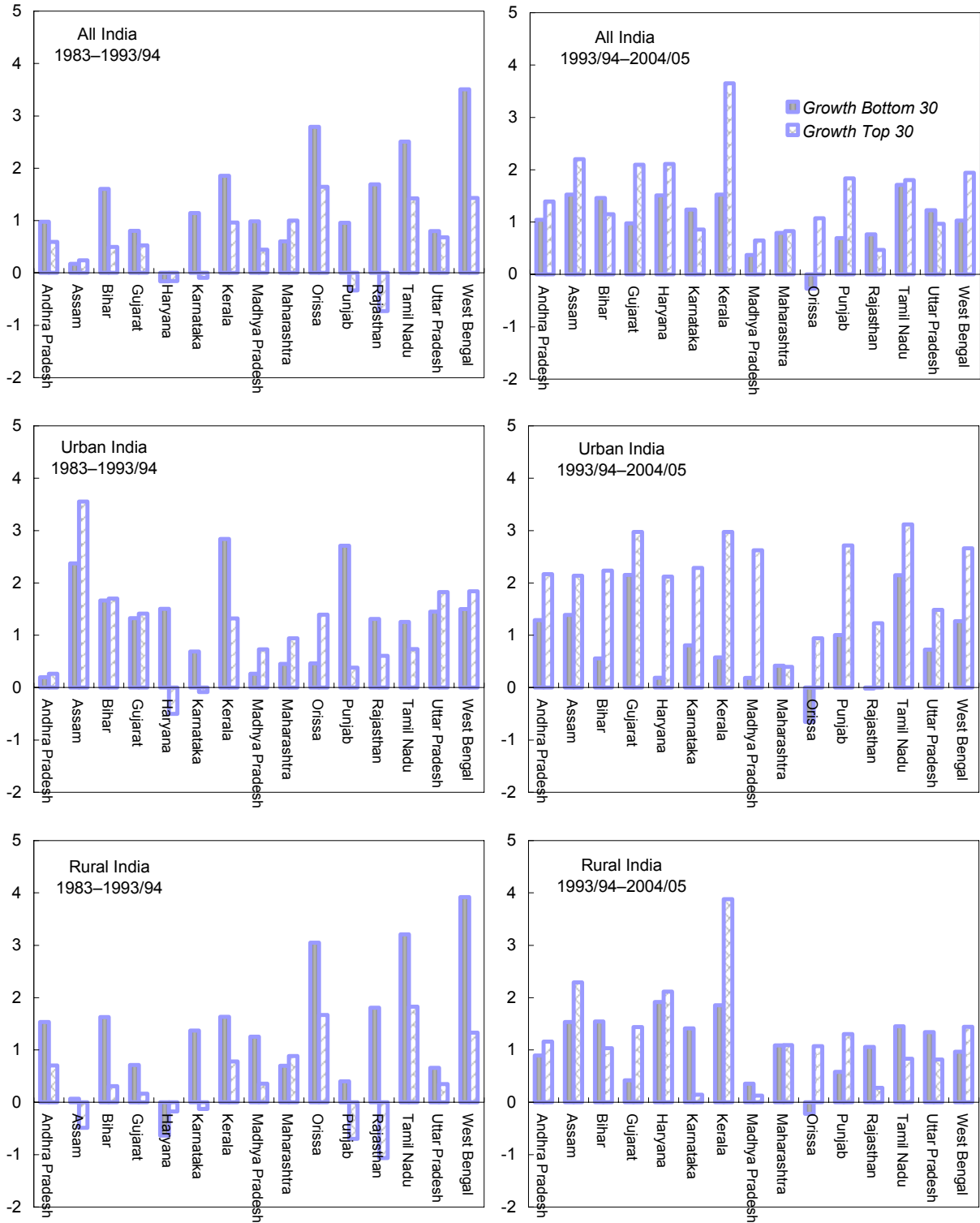
27. Should the government be concerned that inequality is increasing? It is certainly true that the entire population, rich and poor alike, are significantly better off now than ten or twenty years ago. What are the costs or benefits associated with higher inequality? Providing a definitive answer to this question is beyond the scope of this paper. Nevertheless, it, may be useful to consider the characterization of Chaudhari and Ravallion (2006), who argue that there are two types of inequality. “Bad inequalities,” typically rooted in market and government failures, are those that prevent individuals from connecting to markets, and limit investment and accumulation of human and physical capital, such as geographic poverty traps, patterns of social exclusion, lack of access to credit and insurance, etc. “Good inequalities,” on the other hand, reflect the role of economic incentives. Widening income gaps, arising from an increase in the skill premium, increases the incentive for investment in education and may eventually narrow over time as the younger generation invests more in their human capital. Thus, policy makers should focus on how to increase access to and quality of schooling, and remove potential sources of “bad inequalities.”

Figure V1.1. India: Patterns of Real Consumption Growth



Source: NSSO various rounds and Fund staff estimates.

Figure VI.2. Real Consumption Growth of the Top and Bottom 30 Percentile of the Population Across India's States



Source: NSSO various rounds; and Fund staff estimates.

Table VI.1. India: Economic Growth in the 1980s and 1990s

Period	Average Annual Growth of Per Capita 1/				
	GDP	Private Consumption	Private Consumption	Private Consumption	Private Consumption
		NAS	NSS 2/	Rural NSS 2/	Urban NSS 2/
1983–1993/94	3.11	1.84	0.91	0.76	1.23
1993/94–2004/05	4.43	3.30	1.31	1.12	1.74

Source: IMF WEO, NSSO 38th, 55th, and 61st rounds; and Fund staff estimates.

1/ In constant prices.

2/ Converted in real terms using the official deflators of the Planning commission.

Table VI.2. India: Evolution of Poverty

	Poverty Rate 1/			Poverty Depth 2/		
	All India	Rural	Urban	All India	Rural	Urban
	1983	45.2%	46.2%	42.1%	12.6%	13.0%
1987/88	39.3%	39.3%	39.2%	9.6%	9.4%	10.4%
1993/94	35.8%	36.8%	32.8%	8.4%	8.4%	8.3%
2004/05	27.5%	28.0%	25.8%	5.7%	5.5%	6.2%

Source: NSSO various rounds; and Fund staff estimates.

1/ Defined as the share of the population below the poverty line.

2/ Defined as the mean distance below the poverty line as a share of the poverty line.

3/ At 93/94 prices in rural India.

Table VI.3. India: Evolution of Inequality

	Gini			Theil Index			Log (PCE 95 / PCE 5) 1/			Variance of Log Consumption		
	All India	Rural	Urban	All India	Rural	Urban	All India	Rural	Urban	All India	Rural	Urban
	1982/83	0.319	0.312	0.340	0.198	0.191	0.215	1.774	1.740	1.866	0.303	0.290
1993/94	0.303	0.285	0.343	0.191	0.171	0.235	1.638	1.537	1.878	0.263	0.234	0.345
2004/05	0.325	0.298	0.378	0.228	0.196	0.288	1.692	1.541	2.029	0.285	0.240	0.402

Source: NSSO various rounds; and Fund staff estimates.

1/ Log of the ratio of the per capita expenditure of the 95th percentile relative to the 5th percentile.

Table VI.4. India: Decomposing Changes in Poverty				
	Initial Level of Poverty	Change in Poverty	Contribution of Growth	Contribution of Change in Distribution
1983-1993/94				
Rural	0.4617	-0.0933	-0.0683	-0.0249
Urban	0.4208	-0.0925	-0.0973	0.0047
All India	0.4524	-0.0940	-0.0808	-0.0132
1993/94-2004/05				
Rural	0.3684	-0.0880	-0.1071	0.0191
Urban	0.3283	-0.0702	-0.1237	0.0536
All India	0.3585	-0.0837	-0.1151	0.0314
Source: NSSO various rounds; and Fund staff estimates.				

	Bottom10–Top10		Bottom20–Top20		Bottom30–Top30		Bottom50–Top50	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Real per capita NSDP growth	-0.016 [0.202]		0.005 [0.159]		0.001 [0.134]		0.001 [0.095]	
Real per capita agriculture growth		0.029 [0.072]		0.032 [0.051]		0.021 [0.040]		0.013 [0.026]
Real per capita industry growth		0.139 [0.109]		0.145 [0.087]		0.142* [0.071]		0.105** [0.049]
Real per capita services growth		-0.591*** [0.182]		-0.496*** [0.143]		-0.421*** [0.121]		-0.292*** [0.083]
Number of observations	45	45	45	45	45	45	45	45
Note: All regressions include state and period fixed effects and are weighted by the square root of the number of observations within a state. Robust standard errors in parenthesis. Data are from Schedule 1 of NSS 38th, 43rd, 50th, and 61st rounds.								

Table VI.6. Growth Inclusiveness and Economic Policy

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Bottom30–Top30								
Log real credit per capita	3.780** [1.801]					5.429*** [1.837]	7.073** [2.845]	6.163** [2.217]	3.865*** [1.264]
Labor laws		-0.682 [0.674]				-1.138** [0.500]	-1.347 [0.803]	-1.252* [0.609]	-0.807** [0.342]
Share of secondary and above			0.253* [0.137]			0.235* [0.113]	0.445** [0.177]	0.331** [0.134]	0.139* [0.074]
Infrastructure index				2.990* [1.540]		2.502** [0.915]	4.069** [1.482]	3.122** [1.115]	1.654** [0.624]
Log socioec. exp. per capita					2.1 [1.718]	-1.506 [1.428]	-1.92 [2.029]	-1.822 [1.635]	-1.02 [1.003]
Log real NSDP per capita	-1.622 [2.817]	-0.641 [2.917]	-1.648 [2.872]	-3.03 [3.200]	-1.351 [3.037]	-3.799 [2.499]	-4.667 [3.791]	-4.382 [2.985]	-2.589 [1.748]
Share of farmers	0.232 [0.205]	0.224 [0.283]	0.215 [0.245]	0.161 [0.207]	0.238 [0.237]	0.281 [0.189]	0.723** [0.287]	0.430* [0.221]	0.152 [0.140]
N	43	43	43	43	43	43	43	43	43

Note: All regressions include state and period fixed effects and are weighted by the square root of the number of observations within a state. Robust standard errors in parenthesis. Data are from Schedule 1 of NSS 38th, 43rd, 50th, and 61st rounds.

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VII. INDIA'S SOCIAL PROTECTION FRAMEWORK¹

“I find we spend far too much money funding subsidies in the name of equity, with neither equity objectives nor efficiency objectives being met. Can we find more rational solutions to the problems of imbalances and inequities in growth?”

(Prime Minister Manmohan Singh)²

A. Introduction

1. Despite a remarkable reduction in poverty over the last three decades, India is still home to the largest number of poor people in the world. Between 1973/74 and 2004/05, the poverty headcount ratio fell by half, from 55 percent to 27 percent. Even so, roughly 300 million people are still below the poverty line. Income inequality, which has traditionally been relatively low in India, has increased over the last decade, reflecting in part the rising return to skills and education as the Indian economy develops.

2. **Spending on social safety net programs in India has been broadly in line with other regional economies.** According to official estimates, total expenditure on the major entitlement schemes was about 2.1 percent of GDP in 2006/07, with a further 2.2 percent of GDP spent on major input subsidies (food, fertilizer, and fuel).³

3. **However, there is a common perception that the poor have not benefited from these programs.** The Government of India has estimated that if the amount spent on subsidies and poverty alleviation programs in 1999/00 had been transferred directly to the poor and disadvantaged, it would have raised consumption sufficiently to eliminate poverty.⁴ Another concern is that social protection programs are still heavily geared towards poverty alleviation, and provide little social insurance. In particular (as noted by Dev et al. (2007)), India's prevailing safety net programs do not seem to address the most dominant and pervasive risk of poor households, namely exposure to serious health risk. A shift towards greater provision of social insurance therefore seems warranted, given that India's robust economic growth is likely to reduce poverty further, while rising dislocation associated with this growth (as some sectors flourish while others wither) raises the need for social insurance.

¹ Prepared by Andrea Richter Hume.

² Speech given at the Institute of Economic Growth (New Delhi - December 15, 2007).

³ The estimate for subsidies includes off-budget bonds issued to compensate the Food Corporation of India and oil producing companies for losses incurred from the provision of goods at administered prices.

⁴ Planning Commission (2007), p. 15.

4. **Strengthening the social protection framework is therefore an important plank of the government’s inclusive growth strategy.**⁵ Spending on flagship programs (including rural and child health and school-related programs) has been raised significantly, while a series of new programs has recently been introduced, including a national rural employment guarantee and social insurance for informal sector workers. Efforts are also underway to increase the efficiency of existing programs. Over the longer term, the government aims to double total expenditure on education and health to 9 percent of GDP by 2012.

5. **This chapter describes some of the larger programs under India’s social protection framework, and ideas for their reform.** Section II presents the broad contours of India’s social protection framework, while Sections III–V provide a more detailed discussion of protective, preventive, and promotional measures, respectively. Some concluding thoughts are presented in Section VI.

B. Broad Contours of India’s Social Protection Framework

6. **A comprehensive assessment of India’s social protection framework is challenging, given the large number of programs that could be considered part of the framework.** As noted by Srivastava (2004), these expenditures can include investment in social and human capital and physical infrastructure; more direct poverty-targeting programs, such as primary education and basic health services; and interventions that explicitly seek to target the poor, and especially the poorest of the poor. In total, India spends about 4¾ percent of GDP on education and health (Figure VII.1), which compares relatively favorably with similar economies, but is considerably less than such spending in more advanced emerging markets.

7. **In India, hundreds of “centrally sponsored schemes” (CSS) are part of the social protection framework.** The CSS are managed by a large number of ministries, which complicates their coordination and results in considerable overlap between them. Under the Common Minimum Programme (CMP), the government aims to focus its social sector spending on flagship programs (see Table VII.3 for examples), while gradually consolidating others. Such consolidation holds out considerable promise for increasing efficiency in the delivery of social benefits.

8. **This chapter focuses on the largest programs (by expenditure), given their importance in terms of number of people affected, as well as their role in government spending.** India’s social protection programs are discussed under three main headings⁶:

⁵ The term “social protection” includes (i) policies generally considered part of a “social safety net,” i.e., that protect people when they fall into poverty, and (ii) policies that provide “social insurance,” e.g., old age income support and disability insurance.

⁶ This follows a widely used categorization of social protection measures in India, e.g. Dev et al. (2007).

- *Protective measures* provide relief against deprivation to the chronically poor, as well as those falling into poverty because of shocks. The principal program is subsidies for food and other key commodities (provided through the Targeted Public Distribution System). Other programs include social pensions and housing programs for the poor.
- *Preventive measures* seek to avert deprivation prospectively by supporting households' efforts to manage different risks and shocks *ex ante*. They would include unemployment insurance, health insurance, and old age pensions.
- *Promotional measures* seek to improve incomes, both in the near term (through livelihood interventions) and in the longer term (through human capital interventions). Key programs for the former are targeted credit and workfare programs for the poor, and for the latter, interventions to support human capital investment (e.g., school stipends, midday meals, and conditional cash transfers).

C. Protective Measures

9. **Protective programs represent the core element of India's social safety net, reflecting its focus on poverty alleviation.** The subsidized provision of commodities is the largest social assistance program in India, expected to cost around 2¾ percent of GDP in 2007/08. Other protective programs (on which spending is much smaller) include social pensions for the destitute elderly, the disabled, and widows, and targeted subsidies for rural housing.

Subsidies

10. **The principal consumer subsidies are those provided for the consumption of food, fertilizer and fuel.** Expenditure on subsidies has risen sharply in recent years, reflecting the rise in commodity prices. Additional "implicit" subsidies are provided on a range of non-public goods where users are identifiable and user charges can be levied.⁷ Net of such user charges, implicit subsidies amounted to an estimated 2½ percent of GDP in 2003/04.⁸ The high and rising cost of subsidies, combined with longstanding concerns about poor targeting of this benefit, has led to broad-based calls for revamping the subsidy framework.⁹

⁷ The goods and services under reference are those categorized as social services (education and health) and economic services (e.g., in the spheres of agriculture, energy, and industry).

⁸ Government of India (2004), p. 4. Data limitations preclude the calculation of more recent estimates of implicit subsidies.

⁹ A 1997 discussion paper of the Government of India critiqued the subsidy regime as unduly large, non-transparent, largely input-based and poorly targeted, generally regressive, and inducing waste and misallocation of resources (Srivastava et al. (2003), p. 1).

*Food subsidies*¹⁰

11. **Targeted food subsidies for consumers are provided through the Targeted Public Distribution System (TPDS).** The TPDS aims to reduce chronic poverty by providing essential commodities at highly subsidized prices, primarily rice and wheat, but also sugar, kerosene, and fertilizer. In 2007/08, food subsidies are projected at 1 percent of GDP.

12. **The current system relies on household poverty as the basis for targeting.** All “below poverty line” (BPL) households are entitled to a certain quantity of subsidized food. Families above the poverty line (APL) are able to purchase commodities at their market price. The central government—through the Food Corporation of India—is responsible for the procurement, storage, transportation, and bulk allocation of foodgrains. State governments are responsible for the identification of BPL families, issuance of ration cards, and supervision and monitoring of local distribution to consumers. Between one-fifth and one quarter of households purchase grains through the TPDS, though this share varies significantly across India. The share of TPDS grains in total household foodgrain consumption is substantial, about one-half, though again the state-level variation is high.

13. **The performance of the TPDS has generally been very poor.** The Government of India (2005) has characterized the TPDS as highly inefficient, with the cost of income transfer to the poor much higher than through other programs: for one rupee worth of income transfer to the poor, the government spends Rs 3.65. Implementation is plagued by large errors of exclusion, with only 57 percent of poor households covered. And leakage and diversion of benefits to the non-poor are also very high, with about 58 percent of the subsidized food grains issued from the central pool not reaching BPL families because of identification errors, non-transparent operation and unethical practices in the implementation of TPDS.¹¹

14. **The methodology currently being used to identify benefit recipients (which is based on proxy means testing) has several shortcomings: indicators are poorly chosen and not weighted, and there is no variation across the states.** The Planning Commission is currently re-assessing the targeting methodology so as to improve the targeting efficiency of food subsidies as well as other social assistance programs.¹²

¹⁰ India has a long history of food subsidies, which were first provided in 1939 in the context of food shortages. See Planning Commission (2005 and 2007) for a detailed analysis of India’s food subsidy program, including reform ideas.

¹¹ The distribution of BPL cards has been problematic: only 41 percent of the poorest rural households and 29 percent of the poorest urban households held BPL cards, indicating that a fair process has not been followed their distribution.

¹² Castañeda, et al. (2005) evaluates targeting methodologies in five Latin American countries and the U.S..

15. **The government has been evaluating whether a smart card system for the major entitlement schemes could reduce leakages.**¹³ The Planning Commission working group on the integrated smart card system has recommended that the government introduce such a system for the major entitlement programs. Such a system would allow income to be transferred directly to the poor, which many would consider optimal from a social welfare standpoint. Smart cards could be programmed with the identity of the card holder (photo and biometric fingerprint), and include information on socioeconomic characteristics, which determine the level of benefit. It could be transferred in lump sum, or used at the point of collection of the subsidized commodity. Smart cards have been used in many countries already as a means to reduce leakage in the delivery of social benefits (Box VII.2).

Fuel subsidies

16. **Fuel subsidies are available on a universal (untargeted) basis, and vary by product.** They are highest for kerosene, which is used most intensively by lower-income households and in late 2007 was being sold at about 40 percent of the market price. LPG, which is widely consumed by higher income households, was available at about half the market price, while other fuels (gasoline and diesel) have been subsidized to a much lower extent (about 10–20 percent).

17. **The cost of fuel subsidies has risen sharply in recent years, reflecting the growing difference between administered and world oil prices.**¹⁴ Including off-budget “oil bonds” issued to petroleum-sector companies in recent years to help offset significant losses resulting from price controls, oil subsidies amounted to 1.4 percent of GDP in 2006/07. Based on WEO forecasts for oil prices, fuel subsidies could average about 1.9 percent of GDP through 2012/13 if administered prices are not increased.

18. **There appears to be ample room to cut back expenditure on fuel subsidies without unduly affecting poverty.** The subsidy on kerosene, which is the only product consumed primarily by the poor, accounts for only one quarter of the total fuel subsidy bill. In 2006, the Rangarajan Committee on Pricing and Taxation of Petroleum Products had recommended restricting kerosene subsidies to BPL families, using a single retail price and passing subsidies through mechanisms such as debit cards.¹⁵ The Committee also recommended that the subsidy on LPG be eliminated gradually (since this fuel is mainly used

¹³ Planning Commission (2007).

¹⁴ A system of quasiautomatic fuel price adjustments had been introduced in early 2002, but was suspended in late 2003 when global oil prices began to rise. Since then, prices have been adjusted only partially. See “Dealing with Higher Oil Prices in India,” E. Fernandez, India—Selected Issues (IMF Country Report No. 06/56).

¹⁵ A cautious approach is needed when reducing kerosene subsidies, given kerosene’s importance in rural areas as a lighting source, in the absence of reliable electricity (Gangopadhyay et al. (2005), p. 2335).

by non-poor families), while for gasoline and diesel, subsidies should be eliminated altogether.

Fertilizer subsidy

19. Subsidized fertilizer (primarily urea) is available to farmers on a universal basis.

The retail price of fertilizer is fixed and uniform throughout the country, with producers compensated for the difference between the retail price and the cost of fertilizer production. Expenditure on the fertilizer subsidy was about ½ percent of GDP in 2006/07, about a third of which went to producers.

20. In light of the rising cost of fertilizer subsidies, the government has on various occasions considered phasing them out. While the CMP called for subsidies to be targeted sharply at poor and marginal farmers, the government recently affirmed that the current subsidy framework will remain in place for at least another year. A proposal to introduce a smartcard system to distribute subsidies directly to farmers has been under discussion.¹⁶ The government is also considering an expansion of the list of fertilizers that are eligible for subsidy (though not of the subsidy bill) to include more complex products and encourage the use of a wider range of fertilizers considered more productive and environmentally friendly.

21. A reduction in fertilizer subsidies is advisable, not solely from a cost-savings perspective. As noted by Fan et al. (2007), to sustain long-term growth in agricultural production and achieve a sustainable reduction in rural poverty, the government should increase investment in agricultural R&D, rural infrastructure, and education, rather than focusing its financial support on fertilizer subsidies. Some have argued that reducing the fertilizer subsidy could reduce foodgrain production and hence compromise food security. However, if the elimination of the urea subsidy encourages farmers to employ a more favorable mix of fertilizer nutrients, it is possible that the increase in foodgrain production due to a better fertilizer mix could well be in excess of any reduction in foodgrain production because of an increase in urea prices.

Other Protective Programs

22. India has social (cash) pensions that aim to alleviate chronic poverty among specific social groups. Old age pensions have been available under the National Social Assistance Program (NSAP) to destitute individuals age 65 or older. In 2007, eligibility was extended to all BPL individuals over the age of 65, nearly doubling the total number of beneficiaries to 15.7 million elderly people.¹⁷ Nearly all states provide a similar social

¹⁶ Four states had volunteered to be part of a pilot study on using smart cards to deliver fertilizer subsidies, but subsequently all backed out, reportedly due to political opposition to the reform.

¹⁷ Spending on social pensions under the new eligibility and monthly pension standards would amount to less than 0.1 percent of GDP per annum.

pension scheme for destitute widows and disabled people. There is also a national family benefits scheme that provides a lump sum benefit in the case of death of the primary breadwinner of a BPL family. Spending on all such programs is significantly less than on subsidies.

D. Preventive Measures

23. **Preventive measures represent a relatively underdeveloped pillar of India's social protection framework.** As noted by Heller and Rao (2006), unemployment insurance does not exist, while in the health sector, a weak public health service has resulted in the bulk of health care being provided by the private sector. The various forms of formal retirement savings schemes cover only about 13 percent of the labor force. An important next step in the development of India's social safety net will be to develop its social insurance programs.

Old Age Income Security¹⁸

24. **India's public pension system is very small, covering only 13 percent of the workforce.** The public pension system has only been available to government employees and workers in the organized private sector (who account for only 6 percent of the employed population). This means that the vast majority of Indian workers have not had access to official old-age income security programs. Although pensions for the organized labor force in the private sector have been available since 1952, through the Employees' Provident Fund and Employees' Pension Scheme, the system is heavily undersubscribed, with only 40 million members.

25. **A significant overhaul of India's pension system is currently underway, which should greatly enhance the availability of old-age income security.** On January 1, 2004, a New Pension System (NPS) was launched, which shifted all new central government employees to a defined contribution plan. In addition, the reforms outlined in the Pension Fund and Regulatory Development Authority Bill (2005) will allow the launch of personal pension accounts in India and make the NPS available to all workers in the unorganized private sector. It will also be available on a voluntary basis to any person governed by the organized sector schemes. By April 2007, about 500,000 members had joined the NPS, about twice the amount that had been expected for this period.¹⁹

26. **The principal provisions of the new scheme are in line with best international practices.** The employee contribution rate will be 10 percent, while the targeted terminal replacement rate will be 50 percent of the final wage. However, there are two important deviations from international best practices. First, the scheme does not provide a guaranteed

¹⁸ This section draws on Poirson (2007).

¹⁹ *Financial Express* (April 10, 2007).

minimum pension for participants. Second, participation is mandatory only for new central government employees and new employees of the 19 state governments that have joined the NPS.

Social Security and Health Insurance for Unorganized Workers

27. **In 2007, the government launched two new schemes targeted at the unorganized sector.** *Aam Admi Bima Yojan* will provide insurance to the head of rural landless households against natural death, as well as accidental death and disability. *Rashtriya Swasthya Bima Yojana* will provide health insurance to all BPL families in the unorganized sector, with full coverage to be achieved over the next five years.

E. Promotional Measures

28. **India's social protection framework includes a wide variety of promotional measures.** The bulk of the expenditure has focused on livelihood support, though there are also interventions to promote certain outcomes. Workfare schemes in India date back to famine relief policies in the late 19th Century, and some have performed very well: for example, the Maharashtra Employment Guarantee Scheme introduced in the 1970s is often cited as a model safety net for a developing country.²⁰ Other promotional measures include school stipends and mid-day school meals, child and maternal health programs, and self-employment programs for the rural poor.

Public Works

29. **The National Rural Employment Guarantee Scheme (NREGS), launched in 2006, represents a major expansion in India's spending on public works.** Under the program, every rural household is guaranteed up to 100 days of unskilled manual wage employment per year, at the statutory minimum wage for agricultural workers in the state. If employment is not provided within 15 days, the applicant is entitled to unemployment allowance.²¹ The program aims to provide work on labor-intensive projects focusing on rural infrastructure. A key feature is that the program is to be implemented through local governments, unlike earlier programs that were implemented by the central or state governments.

30. **The new program, which is still in early stages, has received mixed reviews so far.** According to official reports, it has done well in meeting demand for employment: nearly all of the 21.2 million households that applied in 2006/07 received work (averaging 41.2 days), and women (whose participation is to be encouraged under the program)

²⁰ Murgai and Ravallion (2005), p. 3450.

²¹ The fact that work is guaranteed gives the program a significant social insurance element.

accounted for about 40 percent of the hours worked.²² However, concerns about corruption have been raised. A recent study by the Centre for Environment and Food Security estimated that about 75 percent of the money spent on the job guarantee program in the eastern Indian state of Orissa never reached the intended beneficiaries.²³ Also, implementation has been found to be highly variable across (and even within) states.

31. **In principle, the NREGS could make a significant contribution to reducing rural unemployment and poverty.** Research suggests that the lean season rural poverty rate could be reduced by 10–15 percentage points, with poorer households benefiting more than others.²⁴ However, India's experience with public works programs raises questions about whether such a program is the most effective way to address rural unemployment. As noted in Ajwad (2007), there have been implementation problems such as misuse of program funds, ghost workers, and underpayment of wages. In addition, the cost of the program—set to rise from 0.2 percent of GDP in 2006/07, to as much as 1½–2 percent of GDP once the program has been rolled out nationally in 2008/09—raises concerns about its implications for fiscal consolidation.

32. **There are also more fundamental concerns about the effectiveness of this spending.** First, as with most workfare programs, it is unclear how large the economic return from the projects undertaken (which are supposed to focus on roads and agricultural infrastructure) will be. Second, implementing such a large program entails significant administrative burdens, and demands a level of efficiency and accountability that previous programs have largely failed to achieve. Close monitoring and evaluation will be critical to ensure the program's success.

Other Promotional Programs

33. **While there are other programs that aim to promote movement out of poverty, historically they have played a small role in the overall social protection framework.** These include programs to promote school enrolment, attendance, and retention; the *Integrated Child Development Services Scheme* (ICDS), which aims to improve the health and general welfare of women and young children; and the *Swarnajayanti Gram Swarozgar Yojana* (SGSY), an integrated microenterprise development program for the rural poor.

34. **Programs to promote school attendance have taken on increased importance.** Despite expenditure on primary school education that is not out of line with that of other

²² Ministry of Rural Development (Government of India)—<http://nrega.nic.in/>.

²³ Rai (2007). A follow-up study by the Government of India found some irregularities, but questioned the allegation of significant misappropriation of funds.

²⁴ Murgai and Ravallion (2005), p. 3454.

countries, the level of literacy amongst young people was markedly lower in other rapidly growing emerging economies in 2000.²⁵ One of the key problems has been to ensure that school attendance remains as high as enrolment. To tackle this, a number of programs have been introduced to draw in pupils from poorer backgrounds, for example the national mid-day meal scheme in primary and secondary schools.²⁶ There are some indications that the program has increased school attendance, especially that of girls, and improved child nutrition.

35. The success of the mid-day meals program highlights the important role that conditional cash transfer (CCT) programs can play in providing income support and promoting the socioeconomic development of the poor. CCTs are a relatively new type of social assistance program that represent an innovative approach to the delivery of social services (Box VII.3).²⁷ They provide money to poor families conditional upon investments in human capital, usually sending children to school and/or bringing them to health centers on a regular basis.

F. Conclusions

36. By improving the efficiency and allocation of its spending on social protection programs, India could likely achieve significantly better social outcomes. Improving the subsidy framework is key in this regard, given how many people rely on this program, and also its importance in budgetary terms. As noted by the Government of India, the main objective of reform of the subsidy regime is to make subsidies explicit, transparent, and work for the poor and the needy. Reform can unleash a virtuous cycle of enhancing the consumption of specific essential items by the poor, reorient public expenditure for investment and infrastructure, and raise the growth of income and employment.²⁸ Reforms that improve the targeting of subsidies and strengthen delivery mechanisms could go a long way towards enhancing their efficiency and lowering their cost. In this connection, monitoring and evaluation of social protection programs needs to be stepped up considerably, to provide policymakers with the information needed to assess program effectiveness.²⁹

²⁵ OECD (2007), pp. 63–64.

²⁶ The program was introduced following a lawsuit that challenged the government to use its vast stores of rice and wheat to alleviate hunger. In response, the Supreme Court ordered the government to provide cooked lunches in all of the country's schools.

²⁷ Rawlings (2004).

²⁸ Government of India, Ministry of Finance (2007b), p. 55.

²⁹ The Planning Commission is developing an integrated accounting system to monitor the progress of its flagship programs. A step in that direction is the planned monthly web-publication (by the Comptroller General of Accounts) of expenditure data on 27 central schemes entailing an annual cost of about 2 percent of GDP. (Hindu Business Line, September 13, 2007).

37. **There is also a need for a significant policy reorientation of the Indian safety net towards social protection programs, in order to meet the changing and increasingly diverse needs of the population.** There should be an increased emphasis on preventive programs which help the poor, and those vulnerable to poverty, to manage risks and shocks better. This would entail expanding programs such as old age income security as well as the quality of public health care. Consolidation of the vast array of social protection programs would also likely bring benefits, given that the large number of schemes under the social safety net contributes to governance problems.

Box VII.1. Social Safety Net Objectives of the Government of India ^{1/}

- *Food and nutrition security:* Improve targeting and reduce inefficiencies of the food subsidy program. Provide a cooked nutritious mid-day meal in all primary and secondary schools.
- *Employment:* Enact a National Employment Guarantee program, under which at least 100 days of employment at the minimum wage will be guaranteed to all poor and lower middle-class households.
- *Education:* Double spending to 6 percent of GDP. Universalize primary education. Expand use of school stipends and meals to increase school attendance.
- *Health:* Triple spending to 3 percent of GDP. Universalize coverage under the Integrated Child Development Services, which provides healthcare and nutrition for children up to 6 years of age and pregnant and lactating women.

1/ These objectives were set out in the National Common Minimum Programme (May 2004) and the Approach Paper to the 11th Plan (December 2006).

Box VII.2. Smartcards: An Innovative Way to Deliver Social Assistance^{1/}

Smartcards provide an innovative mechanism for improving the delivery of cash transfers.

When used for social transfers, each beneficiary is issued with a smartcard that contains information (encrypted on an integrated circuit) on their entitlement to a grant. The smartcard may also contain additional identification data such as biometric fingerprinting. Such systems convey three major benefits compared to traditional social transfer mechanisms (whether in cash or in kind): (i) high security, because of biometric identification; (ii) great flexibility, because beneficiaries can withdraw money when and where they desire; and (iii) increased safety compared to conventional cash delivery. Another advantage is that the government can vary benefit amounts remotely; for example, following a natural disaster, smartcards provide a mechanism for rapid and efficient delivery of additional assistance to those affected.

A wide range of countries are using smartcards for social transfers. In South Africa, Namibia, and Botswana, social pensions are already being paid through smartcards. Each month, the pension is transferred electronically to the card account, and the beneficiary can access the funds either through conventional banks, mobile ATMs, or through simple point-of-sale terminals in retail shops. In Iran, smartcards were adopted in 2007 to provide fuel subsidies. In Russia, the Moscow Social Card distributes pensions and other social benefits, gives access to medical insurance and treatment, and qualifies the beneficiary for retail discounts.

Smartcards are also in use in parts of India. One of the earliest applications was for driver's licenses and vehicle registration certificates, initiated in Gujarat and Madhya Pradesh. In the social transfer realm, smartcards (or similar technology) are being used in the provision of microfinance in Andhra Pradesh, electricity in Sundarbans, and food subsidies in Andhra Pradesh. In 2002, Kerala became the first Indian state to pilot the use of smart cards for food and other commodity subsidies. The Planning Commission has recommended adoption of smart card technology for the national distribution of such subsidies, as well as other welfare benefits.^{2/}

1/ See "Delivering Social Transfers," *Regional Hunger and Vulnerability Program*, www.wahenga.net.

2/ Planning Commission (2007).

Box VII.3. Conditional Cash Transfers

Conditional cash transfers (CCTs) are a relatively recent innovation in the provision of social assistance which is proving effective in reaching the poorest and most vulnerable. The goal of these programs is to both reduce poverty in the short term—by providing income transfers—and reduce poverty in the long term, by making transfers conditional on the poor’s investment in their health and education. In the family context, CCTs make cash donations contingent upon verifiable commitments from parents, such as making sure their children receive immunizations and regularly attend school.

Progresa (now called Oportunidades), one of the earliest of such programs, was launched in Mexico in 1997. ^{1/} The programs’s objectives are threefold: (i) provision of income support to families in extreme poverty; (ii) attainment of higher levels of education, health, and nutrition; and (iii) linking beneficiaries up with new development services and programs that help them improve their quality of life. Health and education grants are offered to families on condition that their children under age six visit health facilities regularly, and those 6–17 remain in school, attending regularly. The program replaced general food subsidies, and is financed by the federal government at a cost of about 0.4 percent of GDP in 2007. The program has grown from an initial 300,000 families to about 5 million in 2007. With an operating cost amounting to less than 6 percent of benefits, *Oportunidades* is viewed as one of the world’s most efficient social programs.

The success of Oportunidades spurred the introduction of CCTs in other countries, including Brazil’s Bolsa Familia Program (BFP), now the world’s largest CCT with about 46 million individuals. ^{2/} The targeting accuracy of the BFP is considered particularly impressive. This has been achieved through geographic means-testing under the unified family registry, with 73 percent of transfers going to the poorest quintile and 94 percent going to the two poorest quintiles. These results put the BFP amongst the best-targeted transfer programs in the world. Thanks in part to successful targeting of benefits, the program has demonstrated a significant impact on poverty and inequality. The BFP is estimated to have accounted for nearly a quarter of Brazil’s recent (and impressive) reduction in inequality and 16 percent of the fall in extreme poverty.

As the BFP shows, CCTs can play an important role in unifying social policy. The BFP has linked up to complementary services and programs at the federal level. It has also been integrated with sub-national CCTs. In this way, it has made social policy more coherent and is facilitating the creation of an effective social safety net. And thanks to the use of innovative performance-based management mechanisms that reward quality implementation, the BFP has been able to succeed in a decentralized context.

Ongoing CCT reform issues include how to promote the “graduation” agenda, to help poor families escape from poverty and reduce their reliance on income transfers. In the case of the BFP, as noted by Lindert et al. (2007), the program could expand incentives for the accumulation of human capital. Some particularly promising and likely feasible options include: (i) raising the upper age for school attendance requirements; (ii) introducing higher benefits for older children (whose shadow wage is higher); and (iii) introducing bonuses for grade completion and school cycle graduation. Another lever is to enhance links of BFP beneficiaries to complementary services, such as social assistance and job-related services.

CCTs have even been adopted in industrialized countries. In September 2007, New York City launched *Opportunity NYC*, the first CCT in the U.S. The program provides education incentives to promote superior attendance and good behavior in school, achievement and improved performance, and parental engagement in children’s education. Health incentives are offered to maintain adequate health coverage, while employment and training incentives will promote increased employment and earnings or combine work activities with specific job training activities. Families will earn from \$50–\$300 for completing a conditioned activity or meeting a specified target, providing additional income of \$3000–\$5000 per year.

1/ Government of Mexico (2007).

2/ Lindert, et al. (2007).

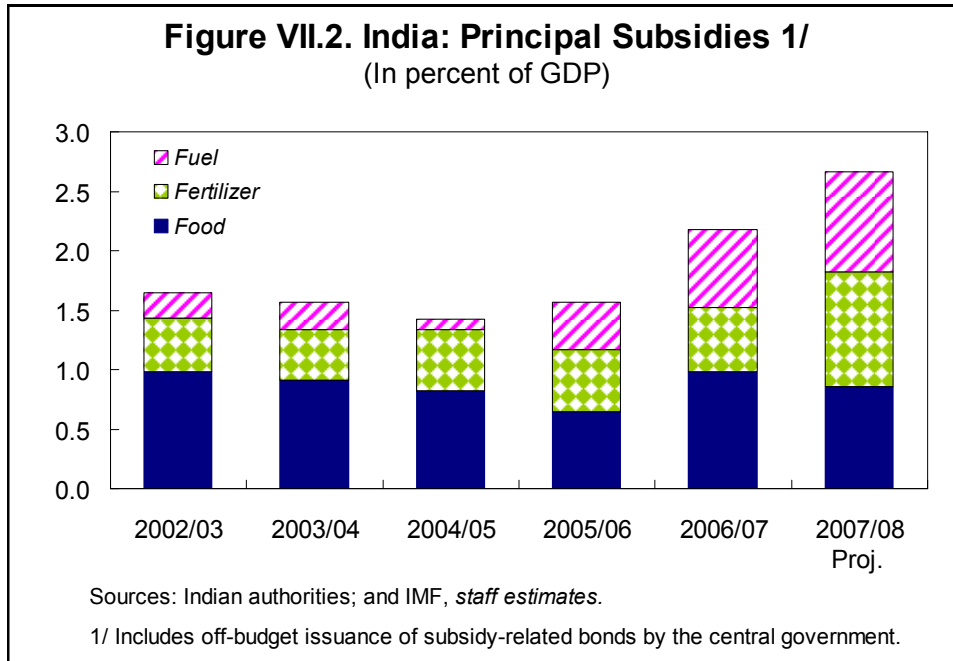
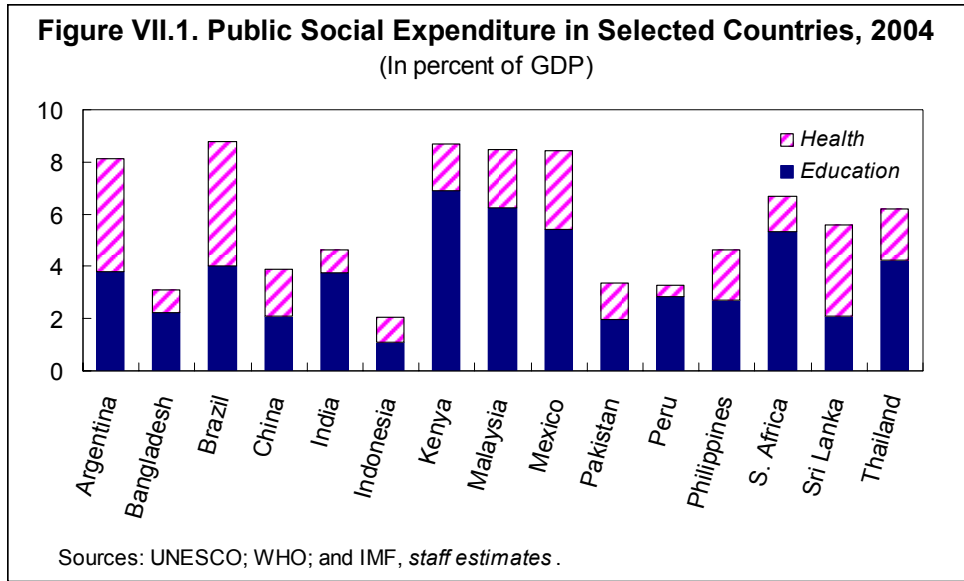


Table VII.1. India: Poverty Headcount Ratio 1/ (In percent)			
	Rural	Urban	All India
1973/74	56.4	49.0	54.9
1983/84	45.7	40.8	44.5
1993/94	37.3	32.4	36.0
2004/05 1/	28.3	25.7	27.5

Source: Planning Commission (Government of India).
1/ Based on uniform recall period data.

Table VII.2. Safety Net Expenditures (In percent of GDP, average for 1972–1997)		
	Social Security and Welfare	Transfers to Organizations and Households
Latin America and the Caribbean	2.9	3.3
Sub-Saharan Africa	1.4	1.5
North America	11.2	12.1
Western Europe	13.6	14.8
South Asia 1/	1.5	2.7
Middle East and North Africa	4.7	6.7
East and Central Europe	10.3	11.7
East Asia and Pacific	2.4	2.3
World average	5.5	7.0

Source: Besley et al. (2003), Table VII.1.
1/ Excludes India.

**Table VII.3. India: Selected Core Social Development Programs
(2007/08 budget allocations)**

	(In billions of rupees)	(In percent of GDP)
Income support		
Rural employment (primarily NREG)	133	0.3
Rural housing subsidies (<i>Indira Awaas Yojana</i>)	40	0.1
Subsidies (primarily food, fuel, and fertilizer) 1/	1,289	2.7
Welfare schemes for Scheduled Tribes / Scheduled Castes	33	0.1
Health		
Integrated Child Development Services	48	0.1
National Rural Health Mission	99	0.2
Education		
Mid-Day Meal Scheme	73	0.2
Universalization of Elementary Education (<i>Sarva Shiksha Abhiyan</i>)	107	0.3
Total	1,822	3.9

Source: Government of India 2007/08 Budget.

1/ Includes staff projections of off-budget subsidy-related bond issuance by the central government.

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