Macroeconomic policy and the exchange rate: working together?

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Abstract

The chapter reviews the behaviour of the Indian exchange rate over the past few years,
and its interactions with the macroeconomic cycle. It examines the extent to which
exchange rate policy has been able to contribute to lowering the probability of currency
and banking crises, ensuring sustainable internal and external balance, and containing
inflation. Given the political economy, more openness, the structural wage-price
processes, the degree of backward and forward looking behavior in the Indian economy,
the chapter draws out implications for macroeconomic policy. It finds that structure
combined with openness actually increases the degrees of freedom and impact of
monetary policy.

Introduction

Macroeconomic policy has been more intensively studied and is better understood for Latin American economies, but emerging market economies (EMEs) differ from each other in important respects. More attention has been focused on Asia after the East Asian crises, and currently on the Chinese exchange rate regime, as reserves grow in Asia and deficits widen in the US. Even so, the unique macroeconomic conditions facing China and India in their rapid catch-up phase of growth are not fully understood. The two countries have more than 2 billion people accounting for a third of the world population. The key transition they both face is one of absorbing labour into more productive modern employment. There are signs that China is reaching the end of this process. Migratory labour is no longer freely available in the SEZ and nominal wages are going up. India lags China ten years in this process. In this paper we examine the implications of a dualistic labour market structure for macroeconomic policy, and in particular exchange rate policy, for India.

We also examine the implications, for the appropriate exchange rate regime, of other major features that impact policy. Among these are the large inflows of global capital after the reforms, frequent temporary and some permanent supply shocks, the absence of full wage indexation for the majority of the population, the prevalence of administered prices, and political factors resulting in an interaction of monetary and fiscal policy that keeps output below potential. The exchange rate regime should be able to contribute to lowering the probability of currency and banking crises, ensuring sustainable internal and external balance, and containing inflation. We examine each in turn in the sections to follow, in the specific structural context[1].

Ever since the Indian reforms and liberalization, open economy issues have dominated monetary policy making. Dealing with the wall of foreign inflows hitting the economy and managing its impact on money supply has been the major day-to-day issue. Financial markets had to be deepened and an exchange rate appropriate for India's wider interface

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[1] The analysis draws on and updates material contained in Goyal, 2002, 2004a, b, 2005a, b, 2006, and Goyal and Pujari, 2005. The data and analysis of trends is until 2006 when the paper was written.

with the world found. Policy has done a good job, on the whole, and flexibly responded to rapid changes. Although financial stability has been maintained and export promotion achieved, exchange rate policy has not contributed as much as it could have towards maintaining internal balance and containing inflation. The implications of structure and of more forward-looking behaviour of markets and consumers have been underutilized. Perspectives from modern open economy macroeconomics explored in this paper suggest considerable degrees of freedom for policy even in the context of high capital mobility.

A change in the value of the rupee has widespread affects and therefore provokes interest. There have been many such changes after the reform. Depreciation hurts all those who have to make payments in foreign currency, while those who receive such payments gain. Thus exporters, and beneficiaries of export spillovers, gain at the cost of the importer, the consumer, the holder of foreign liabilities. Nationalists want the rupee to be strong irrespective of the costs of overvaluation, but the current dominant view is that increasing the productive use of unemployed resources, to which exports can contribute, creates wealth.

The structure of the argument is as follows: in the next section, we examine changes in the nominal value of the rupee since the reforms, and then, in a third section, draw out their implications for stability of forex (foreign exchange) markets. Box 1 shows that hedging tends to be incomplete and yet the exchange rate regime can encourage hedging; Box 2 explores the role of central bank (CB) intervention in focusing market expectations. Both would make forex markets more stable. The fourth section presents the contribution of Indian exchange rate policy to internal balance and argues that the latter was not achieved. Box 3 shows that large negative monetary policy shocks sustained the industrial slowdown. Box 4 explores the consequences of capital account convertibility and India's progress in achieving it. Box 5 lays out the arguments of the simple Mundell-Fleming (M-F) model for a loss of monetary policy autonomy in a more open economy. But a number of deviations from the simple case, which are valid for the Indian economy, imply that monetary policy has considerable impact. The two aspects of external balance examined in the fifth section are, first, the real exchange rate and its

impact on exports; second, the large capital inflows and ballooning reserves. Box 7 argues that given the objective of encouraging exports, and the existence of unemployed resources, stimulating demand is a valid way of absorbing foreign resources available. Box 6 shows that despite more foreign borrowing, net income from abroad has risen as a ratio of GDP in the period after reforms. The sixth section argues that India's labour market structure implies an elastic aggregate supply curve, but one which is subject to frequent shocks. One such shock is a rise in food prices, which triggers off a rise in wages. More openness can contribute to stabilizing food prices and so can changes in the nominal exchange rate, thus giving the CB more weapons to fight inflation, yet maintain demand. Section seven draws out the implications of this structure for monetary and fiscal policy and their coordination, before the final section concludes.

India's changing exchange rate regime

After the dual devaluation in the early nineties, the rupee was market-determined, in the sense that it was now convertible on the current account and the Reserve Bank of India (RBI) was no longer fixing buy and sell quotes. But heavy RBI intervention as it bought and sterilized the boom in foreign inflows, kept the rupee rock steady over 1993 and 1994 (Figure 1, Table 1 and 2).

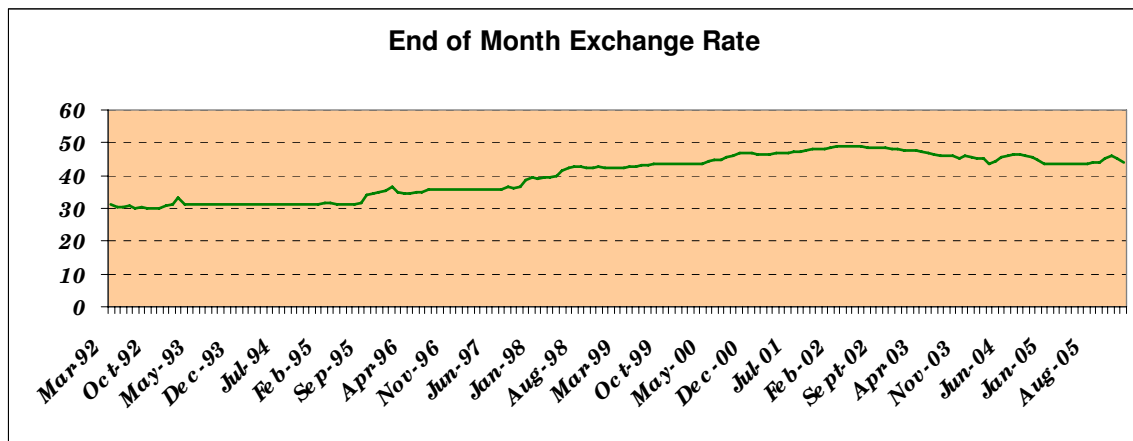**Figure 1: Post-reform exchange rates**

Periodic bursts of volatility occurred over 1995-2000, starting before and continuing over the East Asian currency and banking crisis. The response was to intervene to reduce volatility by raising interest rates and squeezing liquidity. The official policy stance was announced to be market determined exchange rates with intervention to control excess

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volatility. But intervention's other aim was to maintain the unannounced real exchange rate target required to stimulate exports. This led to increasing reserves. Trend steady nominal depreciation was continued through the bursts of volatility, since Indian inflation rates were higher than world rates. Table 1 shows consistent minus signs (denoting rupee depreciation) all through the nineties. The trend was reversed for the first time in 2002 when the dollar began to depreciate under large US twin fiscal and balance of payment deficits. The rupee gained against the dollar even while it did not strengthen against other currencies.

Table 1 gives yearly changes in nominal rupee dollar exchange rates. In Table 2 percentage change between the highest and the lowest daily exchange rate within a year is used to calculate yearly volatility and standard deviation, to get a sense of changes within a year. The table gives interesting information. Both 1999 and 2002 were periods where the exchange rate reverted to being almost frozen. That was partly why there was so much excitement in the markets, and volatility was high when the trend reversed. Reversals after a period of fixed exchange rates cause over-reaction by market players as well as policy makers.

Table 1: Depreciation (-) or appreciation (+) end December	
Year	% change
1993	-1.6
1994	-0.02
1995	-12.1
1996	-2.2
1997	-9.3
1998	-8.2
1999	-2.4
2000	-7.5
2001	-3.1
2002	0.3
2003	5.0
2004	3.5
2005	-3.0

Source: Calculated with data from www.rbi.org.in

The reversal did establish the possibility of two-way movement in nominal exchange rates, which can contribute to the stability of forex markets.

Stability of Forex Markets

Policy makers have traditionally regarded traders in Indian markets as prone to destabilizing speculative behavior[2], but poor market design and predictable one-way movements in exchange rates contribute to such behavior.

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Box 1: Speculation versus Hedging

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Hedging is reducing an existent risk by eliminating exposure to price movements in an asset. Speculation is betting on a one-way price movement. Thus speculators aim to profit by taking a position in the market. If they believe a currency is going to depreciate they sell the currency, or take a position using derivative products. It is not linked to any risk from an existing transaction, but is rather "risk-taking attempts to profit from subjective predictions of price movements" (Shiller, 1993). It is sometimes argued that since speculators buy when prices are low and sell when prices are high, rational speculative activity stabilizes markets. But this does not always follow since speculators buy when there is a high probability of price appreciation and sell when the probability is low (Hart and Kreps, 1986), and thus can cause cumulative movements. Hedging, however, stabilizes markets. First, it removes potential shocks to balance sheets that can destabilize the financial system. Second, if hedging is complete at the aggregate level, long and short positions can be matched with less price volatility.

Hedging through market instruments has a cost[3] but can be potentially costless, for example, writing an insurance contract with someone who has the opposite currency position. But customized OTC hedging products have to be developed to implement such contracts. Financial innovation and competition should reduce the cost of hedging and this is part of market deepening. Informal hedging is also costless. However, hedging does not necessarily rise with the availability of more market instruments, since the same derivative can be used for hedging or for speculation. Incentives to induce hedging are more important.

Hedging is incomplete even in developed markets. Psychological factors undermine rational decisions. Kahneman and Tversky's (1979) prospect theory showed that while people prefer a sure gain, they prefer an uncertain outcome with a small probability of a

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[2] This has often caused great trauma to traders and to certain communities that specialize in trade. See Hardgrove (2004) for a study of the Indian Marwari community, their self-understanding and sense of identity. They were said to be gamblers but for example, the traditional gambling on the rains actually served to hedge against income loss. Political rhetoric even equated foodgrain traders to the rats who eat grains and deserve to be shot.

[3] The approximate annual cost of hedging an NRI deposit against rupee fluctuations was between 130 to 150 basis points in 2006.

gain to a sure loss. Hedging involves a small sure loss or cost, and without it there is a small probability of a gain. Thus they are willing to reduce hedging and undertake more risk than is rational. But subsequent work shows the importance of "framing" for the outcome. If the same choice is translated in a way sensitive to psychological attitudes, risk-taking behavior can reduce.

Moreover, an agent will rationally undertake too much risk under limited liability, when the government, debtors or shareholders absorb bankruptcy costs, while the promoter is able to protect his assets. He will also prefer to speculate rather than hedge if economic structure or policy induces an expected one-way movement in exchange rates. Unhedged short-term foreign borrowing had played a major role in escalating the East Asian crisis. Burnside et. al. (2001) presents evidence that markets, instruments and opportunities existed for hedging in East Asian countries prior to the crisis, although there were some restrictions on the use of currency derivatives, for example in Korea. It was possible for those who took foreign loans to lay off the currency risk. These markets certainly existed in a country like Sweden, which also had a twin crisis in the early nineties. The failure was more of incentives to hedge. Commitment to a pegged nominal exchange rate and domestic interest rates that exceeded international had encouraged firms and banks to over-borrow abroad without covering exchange rate risk. As currencies started depreciating they rushed to buy cover thus increasing the demand for dollars and the pressure on the domestic currencies.

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Table 2: Yearly volatility of the exchange rate		
Years	Monthly high-low % change	Standard Deviation
1993	0.9	0.2
1994	0.2	0.05
1995	12.2	2.7
1996	11.6	2.8
1997	11.3	2.9
1998	11.6	3.2
1999	2.8	0.9
2000	7.8	2.4
2001	4.3	1.4
2002	2.3	0.8
2003	5.3	1.7
2004	6.9	2.1
2005Feb-June	1.3	0.4
2005	6.9	2.1
2006January-July	6.6	2.1

Source: calculated with data from www.rbi.org.in

To make currency markets more stable policy makers need to avoid two traps: first, attempting to curb speculation through quantitative controls or restrictions on derivatives, which impede the development of financial markets, second, creating moral hazard and incentives to undertake more risk using derivatives. Thus market development has to go side by side with improving the incentives for hedging.

Before the reversal in the trend Indian depreciation only importers and those who had borrowed abroad were hedging their forex exposure. After the appreciation, exporters also rushed for cover. There was a 51 per cent rise of activity in rupee derivatives. It continued, however, to be concentrated in few players, mostly foreign banks. Although there are still some restrictions on hedging indirect currency risk, new technology and regulatory market design is enhancing market activity yet lowering destabilizing speculation (Gopinath, 2005).

By 2004 Indian exchange rate policy evolved further in the required direction, with the RBI maintaining some two-way movement while continuing to prevent excess volatility. The identical percentage change in high-low rates and standard deviation over 2004, 2005 and the first half of 2006 suggests a conscious decision to create volatility. There were still periods when the exchange rate was almost frozen, but they had shrunk. One such period was over February to June 2005 (Table 2). In 2006 depreciation and higher volatility began earlier in May, driven partly by the fall out of a crash in stock market indices. Over one week in May 2006, the BSE stock index fell from approximately 13000 to 9000, and then fluctuated.

Figure 2 that graphs daily spot rates over July 2005 to February 2006 also shows the concentration of volatility in a few months. An even spread through the year would imply deep markets and active price discovery. But until markets become deep enough, policy has to space its intervention so as to stimulate markets. While continuing to limit excess volatility, it has to consciously create some volatility.
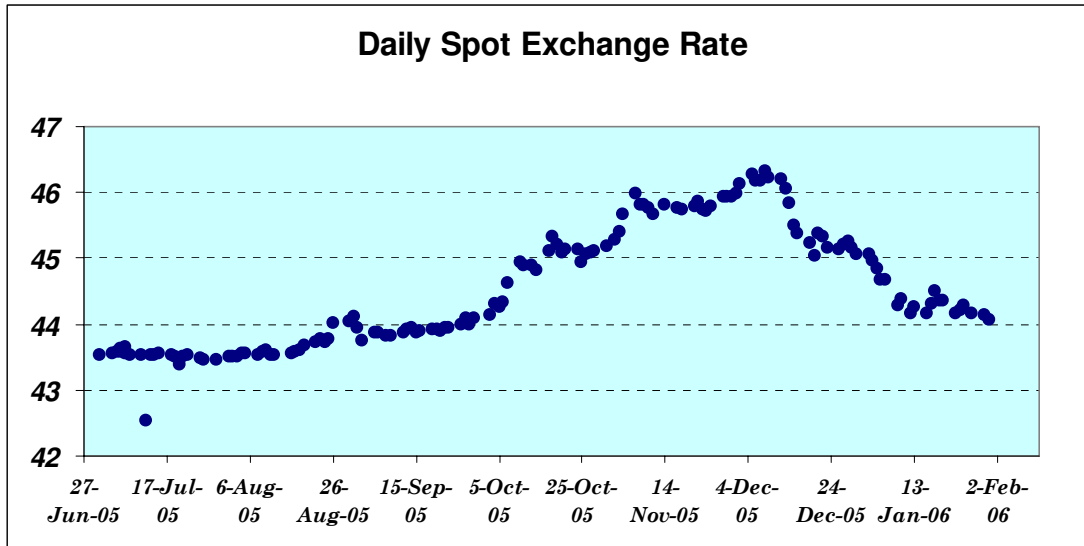
Figure 2: Recent daily fluctuations in spot exchange rates

Box 2 presents some of the reasons forex markets tend to be unstable and therefore the role for and effectiveness of non-monetary interventions from the CB. Moreover, the RBI has the added advantage of the absence of full capital account convertibility (see Box 4). There are quantitative restrictions of various kinds on the forex exposures allowed to different kinds of transactors, which give it additional levers of control. The problem is that these raise transaction costs, are impediments in the smooth working of markets, and are difficult to implement in the electronic age. The second advantage the RBI has is the huge stock of reserves it has built up, so that its market interventions command respect.

Box 2: Forex markets and Central Bank Intervention

There is a basic inequity in forex markets and that is the superior information with the CB and its dominance as a trader. Therefore the forex market is not like any other. Even so, the CB has a healthy respect for the market because of the tendency of market participants to follow each other in unstoppable one-way movements, and the sheer volume of forex transactions. CB reserves can be wiped out in minutes if it tries to defend a particular value of the exchange rate against market perceptions. So the CB watches the market and the market watches the CB in a guessing game. Each wants to know what the other thinks.

Trend following also occurs because people are trying to guess and follow what other people are going to do, rather than base decisions on fundamentals. Herd behavior is especially prevalent where fundamentals are uncertain as in forex markets. Such markets are subject to irrational bubbles, especially so in EMEs where conditions are less settled.

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Other psychological traits compound inefficiencies in forex markets. Past trends are expected to persist, leading to overreaction. The tendency towards mean reversion is systematically underrated (Shefrin, 2001).

Another frequent psychological factor in financial markets is low error bands; that is, judgments are made with overconfidence. Investors tend to believe in their own evaluations and luck, thus suffering from an "illusion of control" (Shiller, 1993). All this suggests there may be a role for exchange rate policy in focusing market expectations.

Exchange rate announcements alone can affect exchange rates because of the CBs dominant position in the forex market, and the market's aversion to uncertainty and ambiguity[4], provided macroeconomic policy is credible. Ultimately a policy that strengthens fundamentals is credible. Initial intervention with the wind may be required to support an announcement. The intervention would be destabilizing, since the CB would buy the rupee when it signals a further appreciation and sell it when it wants it to depreciate. Since it would loose money if the opposite movement occurred, the intervention would be a credible signal of its intention. Market players would follow the signal since they would make speculative profits, for example as they sold a depreciating currency. They would not overreact since of the CB commitment to limiting the volatility. An announcement can be directional and diffuse, but within a pre-specified band, to minimize "loss of face" if the market does not follow. This tends to be a concern with CBs.

Noise traders or those bound by contracts or current requirements would loose. They would be providing the net rupee demand on the opposite side of the market. Since rupee supply would far exceed demand the required depreciation would soon occur. A reversal of the CBs stance, switching from selling the rupee to buying it, for example, may be required if depreciation begins to exceed the required amount. This against the wind intervention implies the CB buys when low. Since it would also sell when high, in the opposite case, if it wanted to stop rupee appreciation, it makes money across the two types of transactions. If the time of intervention followed random supply shocks, it would be random, providing incentives to hedge. Since the intervention is sterilized it implies money supply is not tied to the exchange rate and remains free to respond to the domestic cycle. CB buying or selling of the rupee, or its announcement of an expected direction of movement can alone initiate the change even without any change in the money supply.

Since in an EME such as India, receiving large capital inflows, the CB is always intervening or buying the currency to accumulate foreign exchange reserves and prevent a large appreciation, only some modification of this intervention is required to affect the required changes. On other occasions market driven movements in the exchange rate will

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[4] An example from Indian markets was the "Manic Monday" on May 17th, 2004, due to unexpected election results. Stock markets crashed and had to be shut down. The RBI made a public announcement on its website that it was ready to sell forex and to provide liquidity as required. The availability of the window meant it was not required. Since each player knew that the other knew that liquidity was available there was no need for a panic rush to be the first to draw a limited stock.

continue to occur due to shocks to fundamentals or news from foreign markets; here stabilizing intervention may be required. When the CB influences and limits exchange rate expectations, entry of noise traders is lowered. These are traders without knowledge of fundamentals and who base valuations on others actions. Such traders tend to gain from higher exchange rate volatility so their entry is lowered when this volatility is limited (Jeanne and Rose, 2002), making forex markets more stable. Limited volatility is sufficient to encourage the activity of the well-informed institutional actors that markets in derivative contracts require.

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Apart from improving one's own markets and policy, other ways to reduce the risk associated with capital inflows are improvements in the international financial architecture, and more regional cooperation (Goyal, 2002b). Although the former is stalled, India is making progress in the latter (Reddy, 2005). Apart from contributing to the stability of forex markets, exchange rate policy also has to contribute to internal balance—keeping the economy near full employment—and external balance, or maintaining a balance of payments that is sustainable over time.

Internal and external balance

Internal balance

The response to bursts of high volatility in exchange rates was normally a sharp rise in interest rates. The first such episode in the mid-nineties triggered an industrial slowdown and subsequent such episodes sustained it over 1997-2001. When the domestic cycle required a macroeconomic stimulus monetary policy repeatedly tightened in response to external shocks. Box 3 explains one way of calculating monetary shocks and Figure 3 shows the large negative monetary shocks estimated over this period.

Box 3: Monetary Policy Shocks

The strategy for isolating monetary policy shocks involves making enough identifying assumptions to estimate the parameters of Reserve Bank's feedback rule. These assumptions include functional form assumptions and the assumptions about the variables that RBI looks at while setting up its monetary policy instrument and also what the operating instrument is.

Monetary policy shocks are identified using a short-run vector autoregression model. Since the variables are simultaneously determined over time, an identification assumption on contemporaneous causality is required to be able to isolate the policy shocks. That is, exogenous shocks (foreign oil price inflation and interest rates), and domestic variables (inflation, IIP growth and exchange rate changes) affect the policy instrument variable

(call money rates, or treasury bill rates) contemporaneously, but the policy variables affects them only with a lag. All these variables go on to affect gross bank credit and the broad monetary aggregate (M3). This is a "recursiveness assumption." The foreign variables are block exogenous to the system, since the Indian economy is too small to affect international prices. That is, domestic variables do not enter the lag structure of the foreign variables. The RBI's reaction function or feedback rule to changes in the foreign shocks and non-policy variables determines the setting of the policy instrument variable. The policy shock is the residual after this estimated "reaction" of the RBI. It is orthogonal to the variables in the RBI's feedback rule. The residuals of the 'monetary policy instrument' equation are our estimate of monetary policy shocks.

The model behaves consistently. Responses to shocks are in directions suggested by theory, and thus it can be considered as a good approximation to reality. Estimated monetary policy shocks are graphed below:
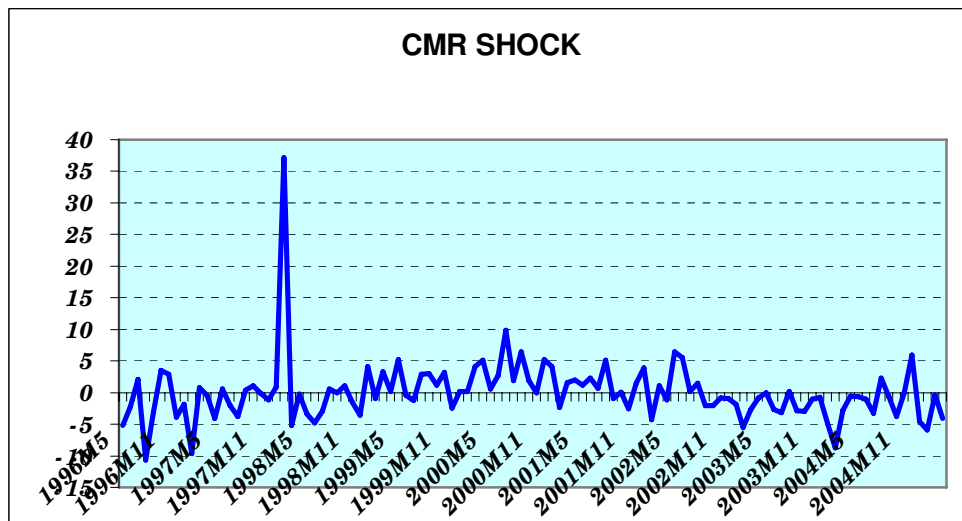

Figure 3: CMR SHOCK

--Contributed by Ankita Agarwal

An analysis of the pattern of macroeconomic volatility across four pre- and post reform, high and low growth periods (Goyal, 2005a), shows Indian interest rate volatility exceeded exchange rate volatility for much of the nineties. Limited exchange rate volatility is easier to hedge than interest rate volatility, which has a deeper impact particularly when bank loans are the dominant mode of finance. Since the reliance on bank debt is high in an EME, sharp interest rate volatility delivers a severe shock to the financial system.

Although post reform foreign financial inflows, measured by the surplus on the capital account rose, their volatility, and that of the major non-controlled components of the capital account fell. The volatility was also much below that of the current account deficit (CAD), whose volatility rose in the period of the slowdown[5]. This suggests the latter may have been policy-induced due to the domestic cycle and not to external volatility. Policy was magnifying the volatility of the inflows, and hindering their absorption. The CAD measures the actual absorption of foreign savings allowing domestic investment to exceed domestic savings[6]. Their trend was stable, but short-term fluctuations of foreign portfolio inflows did contribute to exchange rate volatility. The impact of interest rates rose significantly in the post-reform period. Although in the post-reform period exchange and nominal interest rates were more volatile, volatility in the latter reduced real interest rate volatility.

After 2001 two things happened. Falling US interests rates increased capital flows to EMEs. The calming of the so called EME capital market crises[7] made capital less jittery. There was some reduction in Indian interest rates although not as much as in US rates. Second, the liquidity adjustment facility became operational at this time. It made effective smoothing of liquidity possible and brought all short-term interest rates within a corridor determined by the reverse-repo and the repo rate[8], short-term policy rates. The steady lowering and smoothing of interest rates stimulated consumer spending and industry. But when the US Fed began raising the federal fund rate (ffr) in mid-2004 the RBI followed with quarter point rises in the reverse repo rate from mid-2005. The question arises if it possible for the interest rate to respond to the domestic cycle, with

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[5] The coefficients of variation for the two periods 1992-97 and 1997-03 were -0.48 and -1.97 respectively for the CAD and 0.46 and 0.19 for the capital account. The latter period coincided with the industrial slowdown.

[6] Forex reserves rose to 140 billion US dollars in 2005, compared to a paltry 5 billion in 1990-91. 30 billion dollars were accumulated in just 18 months over January 2002 to August 2003. Arbitrage occurred at the short end since Indian short real rates were kept higher than US rates.

[7] This was the name given to the East Asian currency crises after contagion spread to Brazil and Russia.

[8] The RBI stands ready to lend collateralized liquidity at the repo rate. The reverse repo rate is the rate the RBI pays for deposits kept with it. Thus the repo is the rate at which the market can borrow from the RBI, and the reverse repo the rate at which it lends to the RBI. The first creates injections of liquidity and the second absorbs liquidity.

some independence from international rates, in a more open economy? What is the degree of monetary policy autonomy and what is its impact on output?

The RBI also has to control for changes in US monetary policy since that influences capital flows to EMEs. But the US is following a paradigm of monetary policy that smoothes interest rates and gives excess demand time to reveal itself. So the RBI should have no difficulty in keeping Indian rates aligned. Although US rates have been rising since June 2004, the RBI had degrees of freedom since it had never lowered rates as much as the US[9]. Political rigidities that put a floor on the Indian interest rate structure led to large interest differentials, which invited short-term inflows seeking arbitrage opportunities. These differentials can be lowered as US interest rates rise. A fall in the risk associated with EMEs also makes it possible to lower interest differentials (BIS, 2006). Indian rates can also rule lower than US rates to the extent the rupee is appreciating against the dollar.

India has had a slow relaxation of controls on the capital account through the nineties; capital account convertibility is now high for international capital but still low for outflows of domestic capital (see Box 4). We are closer to a fixed than a flexible rate.

Box 4: The Road to Full Capital Convertibility[10]

Controls raise transaction costs and create inefficiencies. Moreover, capital controls are difficult to implement in a more open and highly wired economy--the nuisance remains without the benefits. Global movement of capital to EMEs has risen. It is feared controls may reduce India's share of the pie (although China has had no problem attracting capital even with controls). India has the human capital to acquire a comparative advantage in the provision of financial services. Their development is handicapped without full rupee convertibility. The latter would also allow productive absorption of excess foreign exchange reserves as individuals optimally diversify their portfolio of assets.

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[9] The lowest value the ffr had reached in mid 2004 was 1 percent compared to 4.5 for the Indian reverse repo rate (rrr). In August 2006 the two rates were respectively 5.25 (ffr) and 6 (rrr). The US Fed, coming to the end of its rising cycle missed a rise in august, while the RBI raised the rrr in July. Since the ffr is the daily rate at which US banks borrow from each other it has to be compared to the Indian call money rate, which is normally higher than the rrr.

[10] This box draws on the author's contribution to *The Economic Times*, Tuesday debate, March 28, 2006, on 'Full rupee convertibility: good, bad or ugly?', and the author's comments made at a brainstorming discussion at the Indian Merchant's Chamber, Mumbai, on 'Fuller Capital Account Convertibility', June 14, 2006.

But short-term capital flows can be excessively volatile, and self-fulfilling panics develop when fundamentals are weak and uncertain in EMEs. Therefore strong fundamentals and crisis proofing are prerequisites for full rupee convertibility. EMEs that opened their capital account without the necessary institutional maturity suffered a series of crises in the nineties. Acquiring external signs of development without the internal strengths is dangerous.

Even so, steady progress is possible on the road to full convertibility. It requires reducing the instability of markets but releasing their strengths. As controls disappear incentive structures have to be in place to induce responsible behaviour, to ensure that both policy and individual responses are such as not to amplify shocks. Market design and incentives have to encourage a shift away from speculative to fundamentals based behaviour.

Crises proofing is required to tackle weaknesses of markets. Pat of this is countercyclical macroeconomic policy that supports trend growth; two-way movement of exchange rates, and a transparent exchange rate policy. Foreign capital comes in because of growth expectations and can go both if growth collapses and if overheating occurs. Policy has to maintain a fine balance.

Financial markets have to be deepened further, and regulation improved to release their strengths. Although reform of legal systems and implementation takes time, regulatory convergence is occurring faster. Debt markets still need to be deepened and international accounting standards adopted. We have made progress on all these fronts. Well-sequenced partial convertibility has already lowered transaction costs and stimulated financial development.

Specific sectoral policy proposals should be assessed in terms of their contribution to overall objectives outlined above, to encouraging innovation, and inducing more competition in markets. Some examples are:

Banks in SEZ make 75 percent of loans to firms that are based in SEZ. It is possible to allow more foreign business, giving banks more freedom to compete in providing offshore services in SEZs, in line with the objective to create international financial centres. Since short-term unhedged bank borrowing abroad was a major cause of East Asian crises—limits on open positions should continue longer, but could be relaxed for individual banks depending on the strength of their balance sheets.

Individuals already had the freedom to remit upto $25,000 abroad in 2006. There is an argument that this was not fully utilized so the limit should be raised only for high net worth individuals. But since this is for portfolio diversification and can lead to unstable outflows, limits should be relaxed only for productive purposes, exports business acquisitions, expansions (above the current 200 percent of a firm's net worth). To develop debt and derivative markets limits for foreign inflows can be raised for longer – term bonds.

Competition and innovation should be encouraged to reduce the cost of hedging while

two-way movement of asset prices encourages hedging. Restrictions on indirect hedging should be relaxed; MIFOR (Mumbai Interbank Forward Offer Rate) swaps for forex exposures, and interest rate futures allowed to develop.

Tax distortions should be removed. For example ECB guidelines should have equal treatment of domestic as well as overseas acquisitions. The withholding tax should be made equal for bank loans and debt issues.

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The Mundell-Fleming (M-F) model tells us that with perfect capital mobility, static expectations, and a fixed exchange rate monetary autonomy is lost. Policymakers often refer to this impossible trinity, feeling a sense of helplessness before the wave of foreign inflows, and the increasing dominance of the market. But going beyond the simple M-F model (presented in Box 5), it turns out that the potential impact of monetary policy has increased with the reforms.

Box 5: The Impact of Monetary Policy in an EME: The Mundell-Fleming Model

Analysis[11] with the simple M-F model (this takes the expected exchange rate to be equal to its current rate) implies that under a float monetary policy is effective in raising output in the short-run but fiscal policy becomes ineffective. The reason is that a rise in money supply depreciates the currency and stimulates exports. But fiscal policy has the reverse effect, which counters the demand stimulus from the fiscal expansion.

Under a fixed exchange rate a monetary expansion lowers the interest rate and the consequent capital outflow necessitates a sale of reserves, which reduces money supply, in order to maintain the fixed exchange rate. Fiscal policy escapes this neutralizing effect. A fiscal expansion raises interest rates above world rates. Maintaining the fixed exchange rate under the consequent capital inflow requires an expansion of reserves and money supply. The latter supports the fiscal expansion thus raising demand and output in the short-run.

With non-static expectations the expected exchange rate can differ from the current rate. Now fiscal policy can also to be effective under a floating exchange rate. The appreciation that occurs implies an expected depreciation back to equilibrium values. Therefore higher interest rates do not lead to a further capital inflow and appreciation crowding out the rise in demand, since uncovered interest parity is satisfied. That is, returns on holding domestic or foreign currency balances are equalized.

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[11] Krugman and Obstfeld (2003) offer a text book treatment that is simple yet in line with modern developments that emphasize asset markets.

Under a fixed exchange rate a monetary boost is still reversed, but devaluation allows reserves, money supply and output to increase in the short-term. An expected devaluation, however, would raise interest rates and if the latter harmed real fundamentals sufficiently, could lead to a capital outflow or attack on the foreign exchange reserves.

In the long-run, of course, macroeconomic policy would not be able to raise output above full employment, and if the economy is at full employment, any monetary impulse would only affect nominal variables.

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The exchange rate regimes in most countries, and especially in EMEs like India, are somewhere between a perfect fix and a perfect float. Even partial flexibility of exchange rates gives some monetary autonomy, and the absence of complete capital account convertibility (as in India) opens up more degrees of freedom, as Figure 4 (Frankel, 1999) shows. The bottom two corners represent a fixed and a floating exchange rate and the line between them depicts the whole range of intermediate regimes. The upper point is a closed capital account, so that in approaching the bottom line convertibility gradually increases until perfect capital mobility is reached on the line. Therefore the impossible trinity is only point A of the triangle. Everywhere else there are varying degrees of monetary autonomy. The impossible trinity, often referred to, occupies only a point in the policy space even in the simple M-F model.

If during rapid transition, as is currently occurring in India, productivity rises, and demand for a country's products rises even faster than productivity, the real exchange rate appreciates. From real interest parity this implies that the country's real interest rate has to be lower than world real interest rates, giving monetary policy a further degree of freedom in adjusting interest rates. If output is less than potential, and rising rapidly, as in India, even a rising money supply can be associated with a nominal appreciation, not depreciation, since although demand for a currency falls with a rise in its relative money supply, it rises with its relative income (Goyal, 2005b).

Market efficiency has never been established for forex markets. Markets can sometimes get stuck in the wrong rate. These factors are exacerbated by goods market imperfections. The exchange rate overshoots to compensate for short-term nominal rigidities, and then

slowly comes back to equilibrium. Excess volatility raises profits for noise traders and attracts more of them. Reducing excess volatility of the exchange rate can give a free lunch by reducing noise trader entry, and focusing market expectations, therefore freeing monetary policy instruments to respond to the domestic cycle (Goyal, 2006).

If the exchange rate is managed it cannot overshoot, but the same market imperfections can show up in excess volatility of interest rates in order to satisfy asset market expectations and currency arbitrage. So some exchange rate flexibility can help smooth interest rates, yet give considerable freedom to adjust short-term interest rates to suit the domestic cycle. For example even if exchange rates vary in a 5 percent band, six month interest rates can vary 10 percent while satisfying uncovered interest parity.
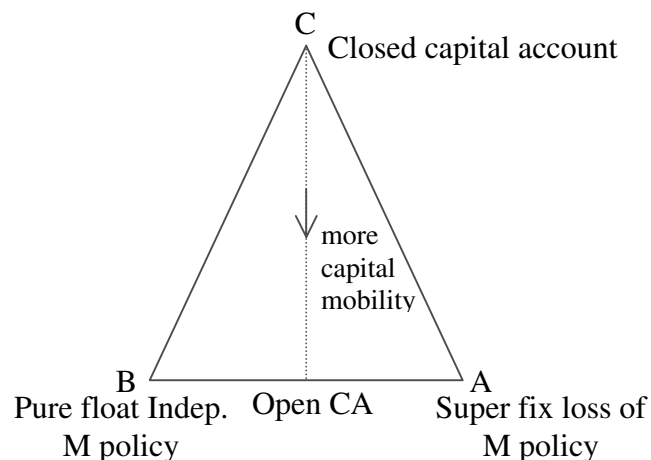
C Closed capital account

more
capital
mobility

B
Pure float Indep.   Open CA   A
M policy   Super fix loss of
                                 M policy

Figure 4: Shrinking the impossible trinity

EMEs like India also suffer from structural rigidities. But some rigidities actually enhance the power of monetary policy. Interest rates generally exceed international rates. Structural changes allow domestic rates to approach international. For example, reform lowers financial repression, deepens financial markets and improves regulation thus lowering the risk premium, lowers inflation differentials and gives more independence for the CB. While the interest differential can become very narrow for certain types of capital where arbitrage is almost free, capital controls and continuing structural impediments allow large differentials to continue in some segments, and there is a role for policy in aligning them.

There are other factors that increase the impact of monetary policy in an open economy. Thus the new open economy macroeconomics (OEM) (Obstfeld and Rogoff 1996) points out that monetary policy can have persistent effects on output and welfare because of wealth effects of current account imbalances. A monetary stimulus raises output where industry structure is such that output is below potential. But now the stimulus has long-run effects. This issue is particularly relevant for an EME like India that should be able to invest more than it saves through a current account deficit, making possible a faster transition to maturity where it reaches its potential output and absorbs all its labour at the technology frontier.

OEM makes it clear that causality runs from macroeconomic policy affecting savings, investment and consumption smoothing, and therefore the current account of the balance of payments. Credible reform and expected future growth can allow a country's consumption and investment to rise, financed by sustainable capital inflows. In both China and India foreign inflows and reserve accumulation have occurred in the presence of large fiscal deficits and government debt. Perhaps because in both countries private savings are high enough to cover government dissaving and the foreign savings flowing in are based on sustainable future growth expectations.

OEM emphasizes forward-looking behaviour and expectations not only on the part of consumers and investors, but also workers. EMEs have rigidities that make forward-looking behaviour the exception rather than the rule. We see how these rigidities have tempered the absorption of foreign savings in the next section, and then go on to argue that even so, labour market rigidities peculiar to a populous democracy can, with suitable policy, actually encourage rapid growth.

External balance
Policy was successful in stimulating exports but less successful in absorbing the foreign savings available. Policy-makers were committed to the successful East Asian and Chinese growth strategy of competitive exchange rates. This strategy effectively ruled

out a substantial appreciation as a means of absorbing foreign exchange reserves through cheapening and encouraging imports. It is also the correct strategy as long as India, like China, has large reserves of labour that need to be absorbed into higher productivity employment to which exports can contribute.

But what was the specific value of the real and nominal exchange rate policy aimed for? The market value of a currency depends on demand and supply of foreign exchange and how these are expected to change. But these are uncertain, especially in a country without deep markets or full capital account convertibility so that the true demand for the currency cannot be revealed. A short-term market indicator of equilibrium rates is the approximate equality of buyer-initiated and seller-initiated orders. Although in the short-term market perceptions and policy can affect the exchange rate, in the longer-term it cannot depart from equilibrium rates determined by macroeconomic fundamentals such as relative money supply, relative output, productivity and demand for a country's products. The rate has to allow a sustainable current account deficit. Investment can initially exceed domestic savings, but the deficit has to turn into a surplus as income levels rise, in order to repay debt. Box 6 shows that payments abroad remained small as a ratio of GDP, and the ratio actually fell over the nineties.

Box 6: The Difference between Indian GDP and GNP

In an open economy, gross domestic product (GDP) can be very different from gross national product (GNP) because Indian nationals hold assets abroad and foreigners hold assets within India. Net income paid abroad has to be deducted from GDP produced within a nation's boundary to obtain the nation's GNP. If a country has been borrowing abroad more than it has been lending the deduction should be high. Figure 5 shows the adjustment as a ratio to GDP. We pay more abroad than we earn so the adjustment is negative. But the amount is low, only about minus half a percentage point. The upward trend in the ratio in the period of reforms is surprising since this was a period of more openness and borrowing from abroad. Time series regressions run by teams of students[12] as a class assignment suggest that rise in GDP, fall in global interest rates, and fall in net interest and service payments, a component of net income from abroad, were the primary reasons for the reduction in the ratio of the payments we made abroad. The last factor was highly significant in the regressions, and had the largest coefficient. As a ratio to

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[12] Anindya Sengupta, Anuradha Ghosal, Arjun Singh, Mamta Agrawal, M. Pratima, Rajendra Gupta, Rama Joglekar, Shazeb Kohari, and Sujeet Kumar revised their work and estimated the robust regressions reported here.

GDP it also fell during this period. We had to pay less for what we borrowed and we had also begun to earn from assets held abroad.
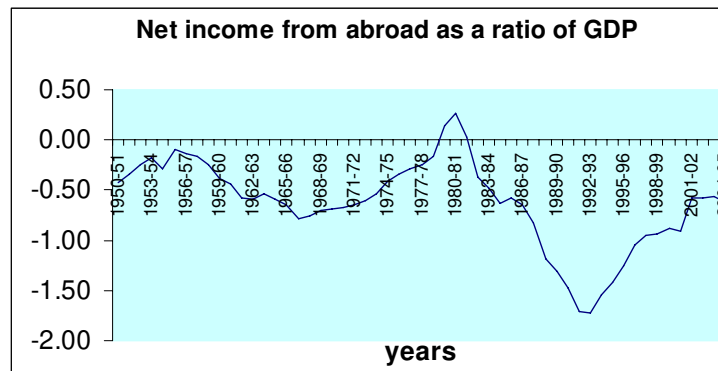
Net income from abroad as a ratio of GDP

years

Figure 5: Borrowing more but paying less abroad

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A number of macroeconomic variables affect the equilibrium real exchange rate, but the latter affects exports. The real effective exchange rate (REER) gives weights according to major trading partners and corrects for relative inflation[13]. The index of the 36 country export based REER, with 1993-4 as the base, was at 100.04 in November 2005, and had largely ruled at just below hundred over the past decade. A rise above hundred would have meant an appreciation over the 1993-94 level. The trouble with the REER is that constancy of the aggregate is consistent with large changes against individual countries. It also does not correct for relative changes in productivity and world demand, which also affect equilibrium real exchange rates.

A 5-country trade weighted REER, with weights based on India's major trading partners, was also calculated. But as the pattern of India's trade changed in this period, a new 6-country trade weighted REER was made available from 2005. This included India's trade with China together with the traditional western partners. Table 3 shows two-way movements in this REER with sustained appreciation in the past few years. But lower Indian inflation and higher productivity growth meant the limited appreciation did not hurt exports, which grew at above 20 percent per annum. Global trade was on the upswing and there was a rise in international demand for Indian products. The nominal

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[13] The REER is therefore the price of Indian output in terms of a basket of foreign currencies.

effective exchange rate[14] (NEER) largely depreciated since our inflation rates were higher than those of our trading partners.

Table 3: Taking account of the trade basket & inflation
(6 country export weights (appreciation +) base 2003-04 =100)

Year	REER	NEER
1994-95	5.7	-3.1
1995-96	-4.3	-8.7
1996-97	-0.2	-1.9
1997-98	3.2	1.2
1998-99	-7.9	-11.9
1999-00	1.6	-0.4
2000-01	5.3	0.3
2001-02	-0.2	-1.8
2002-03	-4.9	-6.3
2003-04	1.5	-1.9
2004-05 (P)	2.5	-0.7
2005-06(December)	6.5	3.4

Source: calculated from www.rbi.org.in

A fixed nominal exchange rate is supposed to stimulate trade by reducing uncertainties, but hedging can remove the impact of limited currency flexibility on trade. Moreover, there is evidence that while currency crises adversely affect trade, limited fluctuation in exchange rates do not have a large effect on trade (McKenzie 2004). If limited volatility helps prevent crises and lower interest rates, it may even benefit trade. Another constraint on rupee movement is that it cannot appreciate substantially unless the Renminbi does so, since China is a major trade competitor and partner. China's tight band with the dollar had been shifted to a currency basket in July 2005, but depreciation has been only marginal. China wants to develop financial markets more and strengthen its weak banks before allowing more exchange rate flexibility.

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[14] The NEER is the price of a rupee in terms of a basket of currencies. The RBI estimates the NEER as the summation of the SDR/ rupee rate divided by the weighted average of the other countries SDR/$ rates, so the units of the NEER are $/rupee. Therefore an appreciation implies a rise in the nominal value.

An economy at full employment requires an appreciation of the exchange rate to absorb foreign inflows since a rise in domestic absorption occurs through a rise in imports. But if there is excess labor, the rise in absorption can occur at an unchanged real exchange rate, through output and capacity expansion (see Box 7). But for this interest rates must be such as to stimulate demand. More capital account convertibility is another way to absorb capital inflows, but this has to be gradual and well-sequenced (see Box 4).

Box 7: Strategies to Absorb Foreign Inflows

The simple Swan diagram below (see Corden, 2002) shows how foreign inflows can be absorbed, without a real appreciation, if there is less than full employment.
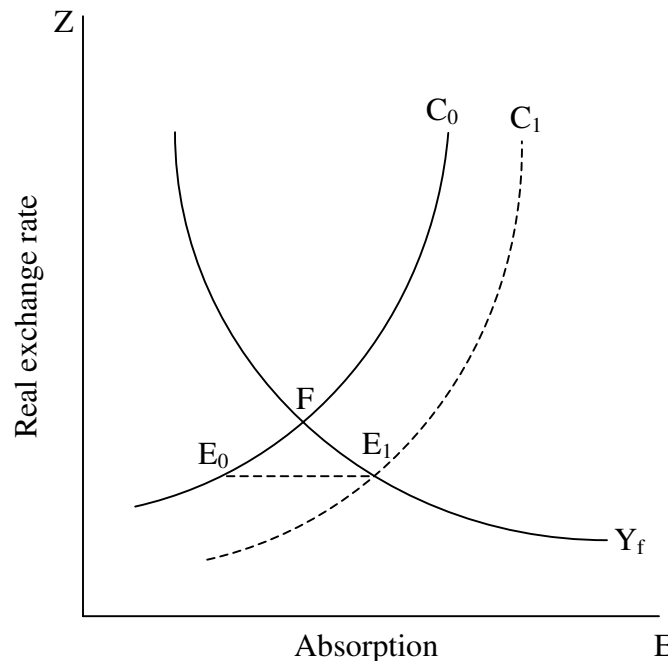

**Figure 6: The Swan Balance of
Payments Model with foreign inflows**

The vertical axis gives the real exchange rate, Z, which is the ratio of traded to non-traded goods prices (P_T / P_N), so that a rise is a real depreciation. The horizontal axis gives real absorption, A, or total real expenditure by the country on domestic goods and imports ($A = C + I + G$). Curve Y_f gives the combinations of Z and A which give output demand equal to full employment output. Values above the curve would generate inflation and those below unemployment. The curve is downward sloping because as domestic absorption rises, Z must appreciate to reduce foreign demand at a given level of output. Curve C_0 gives the combinations of the two variables that yield a given current account deficit (CAD). The C curves are upward sloping because as imports rise with higher

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domestic expenditure Z must depreciate to encourage exports and keep the current account unchanged. A rise in foreign inflows implies a leftward shift of C_0 to C_1 since foreign inflows now finance the rise in CAD as Z appreciates and imports rise.

Now it is easy to see that if the initial position of the economy is on the Y_f curve at F, absorbing foreign inflows through a higher CAD will require a real appreciation. But if the economy is at E_0, a demand stimulus can move it along $E_0 E_1$, and absorb the foreign inflows, at the same real exchange rate.

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Some exchange rate appreciation would help to absorb inflows but it cannot be the major part of the adjustment. Large numbers available to work at low wages prevent the substantial rise in average real wages required for a major currency appreciation. Such a rise in real wages is possible only with a rise in labor productivity in agriculture. Full capital account convertibility, which allows domestic residents to acquire foreign assets, also absorbs reserves, but it raises the risk of capital outflows and crises unless markets and institutions are well developed. Therefore it has to be introduced gradually and in a correct sequence.

Inflation and the labour market

Inflation control is another policy objective exchange rate policy can contribute to. An appreciation is an antidote to price shocks coming from food, oil and other intermediate inputs. This also requires two-way movement of the exchange rate. For example, even if the underlying trend is that of nominal depreciation, a steeper short-term appreciation in response to an adverse supply shock can moderate the relative price shock. Short-term movements in the exchange rate to counter temporary supply shocks can achieve the limited volatility required to stabilize forex markets and also reduce the effect of supply shocks on the domestic price-wage process, through which they impact inflation. Building in a rule whereby there is an automatic announced response to an expected supply shock would avoid the tendency to do nothing until it becomes necessary to over-react. But better forecasting and estimation of macro models is required for such forward-looking policy. This policy implies using the exchange rate to contribute to supply-side management, and insofar as exchange rate policy can be de-linked from changes in the money supply (the section on internal balance shows why this is sometimes possible),

monetary adjustment can be tuned to the domestic output cycle. Even monetary adjustment can change the exchange rate in the right direction. If a negative supply shock occurs under general excess capacity Goyal (2005b) shows that a monetary expansion can lead to an appreciation of the exchange rate.

Under any kind of wage-price rigidity, a rise in relative prices of key intermediate inputs, or of commodities that have a large share in the consumption basket, can raise the average price level or inflation. The labour market plays a major role in the wage-price process of a specific economy[15]. India has a large informal labor market (accounting for 80 percent of the work force) without formal cost of living indexation. Therefore nominal wages respond with a lag to changes in the consumer price index (CPI). But India is also a democracy, and the lack of indexation and large numbers of poor makes the polity very sensitive to inflation. There are political pressures to keep real wages fixed in terms of food. Therefore the lag with which wages respond to changes in food prices is very short. The consumer price index is a weighted average of home and foreign prices, but with a large weight (about 50 percent given to food items). With trade liberalization food prices become more closely linked to border prices and the weight of the exchange rate in the consumer price index (CPI) rises; the exchange rate has a larger affect on the cost of living and therefore wages. Producer prices are marked up on wages, so producer price inflation responds to nominal wage inflation, lagged output (indicating demand pressure) and contemporaneous oil or productivity shocks to supply.

Pressures from well-organized farm lobbies (the rural population exceeds 57 percent of the Indian population[16]) have in the past led to high and rising farm support prices. The compromise was to subsidize both farmers and consumers; the latter through a low price public distribution system. Since the latter was not very effective, protection was not

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[15]Thus real wage rigidity constrained the German Central Bank to be strict, while the US Fed could be more accommodative to domestic cycles because customary three year nominal wage contracts allowed real wages to fall after an unexpected rise in prices (Bruno and Sachs, 1985).
[16] Kelkar (2005) makes the point that India is rapidly urbanizing. The urban sprawl found outside most towns has a much higher population density compared to rural areas. He quotes the Indian Retirement, Earnings and Savings database as giving the occupational breakup for India earners as 6.3 percent in big firms, 9.7 percent in government, 29 percent self-employed, 25 percent in small firms and only 30 percent in agriculture.

complete, and nominal wages rose with a lag in response to a rise in food prices. Farmers also did not make long-term gains from this policy combination since the terms of trade advantage was only short term. It was lost as non-agricultural prices rose with inflation. For labour to move from agriculture to urban activities productivity in agriculture has to rise. The focus on a rising support prices came at the expense of the development of irrigation and other essential agricultural infrastructure. In general in a democracy short-term subsidies gained at the expense of development of infrastructure and human capital. For farmers support polices should shift from raising prices to stabilizing prices; developing human and physical capital and infrastructure; and giving them greater freedom from marketing monopolies. As populations totally dependent on agriculture for their living shrink, but poverty remains high in the large informal sector, stable food prices will benefit a larger group of voters, while providing insurance to farmers.

This migration of populations implies a labor slack. Therefore both in the short-run and over a horizon exceeding one year, which is long enough for the capital stock to rise, mean output lies below potential output. If food prices are stable, capital is available, specific bottlenecks are alleviated and institutional reforms undertaken; supply will not be a constraint on output, which is below the potential that absorbs the labor slack[17]. In the absence of full labour absorption, the forward looking marginal cost facing firms is flat. Large capital inflows and foreign exchange reserves relieve constraints on imports of food stocks, fuel oils and capital goods[18]. Moreover, new technology makes it possible to bypass some deficiencies in infrastructure while easier availability of finance funds its expansion. Reduction in bureaucratic rationing and continuing reforms shorten lags and

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[17] Indian labour laws that make it difficult to retrench labour in the organized sector can make labour expensive; reform here also would help, but changing power equations have given firms many freedoms, for example, in the use of contract labour. A little bit of investment in training makes a large supply of labour available. For example, the Maharashtra Government and the Retailers Association of India have launched a scheme to train slum-dwelling youth from backward castes to man food and grocery divisions in the ongoing retail boom, ensuring a flat supply curve. These tasks do not require very sophisticated skills. Faster growth has not as yet been successful in absorbing labour. The NSSO 60th round reports the unemployment rate for rural males increased over 1993-94 to 2004 from 5.6 to 9 percent and for urban males from 6.7 to 8.1 percent. It increased for women also. Goyal and Pujari (2005) present evidence that the Indian long-run aggregate supply curve is elastic.

[18] It may even relieve India's pressing infrastructure needs. The Indian Government is trying to find innovative ways to use forex reserves to spend more on infrastructure, motivated by the Chinese Government's successful large spending in this area. The inability of the private sector to build infrastructure despite inducements has led to an emphasis on public private partnerships.

delays, making supply more elastic. These factors, together with the large numbers willing to work at a low constant real consumption wage imply constant returns to capital[19], or an elastic supply curve. But this aggregate supply curve is subject to frequent shocks. Therefore monetary policy has to find a way to counter these shocks, while maintaining aggregate demand.

Reforms allow faster labor absorption and an upward trend in the mean output. Capital accumulation and organizational change over time will raise labor productivity, and increasing competition through opening out will reduce mark-ups. These factors will tend to further reduce inflation until the economy reaches a mature steady state. As long as monetary policy is able to anchor nominal wages and inflationary expectations, it can stimulate demand. A rise in credit will finance an expansion in output, capital and capacity. The ability of the CB to focus exchange rate expectations gives it an additional weapon, independent of monetary policy, to counter relative price shocks that trigger wage-price process and raise inflation. It can then focus monetary policy on maintaining demand, in a situation of overall excess capacity and unemployment.

To summarize, if food prices are constant labor cost does not rise; if there is no cost shock, intermediate inputs prices also do not rise; and with labour slack, deviations from mean output are demand-determined with costs remaining constant. Since keeping inflation low and real wages constant in terms of a basic consumption basket are political imperatives, an exchange rate policy that furthers these objectives is politically feasible. As it reduces the necessity for subsidies and administered prices that distort incentives and lower efficiency, it lowers waste in the system. Two-way movement only pre-empts the effect of temporary supply shocks on the domestic price-wage process. This differs from fixing the exchange rate to bring down high levels of inflation, which often leads to

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[19] Aghion et. al. (1999) derive this in a standard Cobb-Douglas production function $Y = AK^{\beta}L^{1-\beta}$ where Y is the output level, K the capital stock, L labor employed. Normalizing the constant consumption wage $W/P_t^c = 1$ (where W is the nominal wage and P the price level) and equating it to the marginal product of labor gives a value for L, which when substituted in the production function gives $Y = A((1-B)A)^{(1-\beta)/\beta} K = \tau K$ or the standard AK production function with CRS. If the average real consumption wage is around subsistence firms do not gain from lowering it, since productivity falls commensurately.

real appreciation and ends in a crisis, as in Latin American exchange-based stabilization episodes. Svensson (2000) points out that the lag from the exchange rate to consumer prices is the shortest.

Structure, Monetary, and Fiscal Policy

To sum up, Indian exchange rate policy has started to contribute to market stability and deepening, and has supported rising exports. Although exchange rates are more flexible, the inflation sensitivity of the electorate ensures the RBI does not have an inflation bias. Since there was no temptation to raise the exchange rate in order to cause surprise inflation, the exchange rate was not systematically undervalued. Since inflation was low there was no need to use the exchange rate as a nominal anchor to stabilize inflationary expectations so there was no overvaluation. But exchange rate policy did not support the adjustment of monetary policy to domestic cycles and to the productive absorption of foreign exchange reserves. Although some agricultural liberalization and falling world food prices did reduce the political pressures that had raised food support prices and inflation, exchange rate policy was not systematically used to moderate the effect of the typical EME supply shocks: oil price shocks and failure of rains. Monetary policy broadly succeeded in preventing an explosive growth in money supply and reined in inflationary expectations, but at a high output cost.

Indian private and corporate savings are high enough to compensate for government dissaving, and a large population employed at low productivity implies that output is below potential. Moreover, political and institutional features result in fiscal-monetary coordination such that the economy remains on an elastic stretch of the aggregate supply curve, unable to exhaust excess labour and capacity. Fiscal populism pushes monetary authorities towards conservatism in order to reduce inflationary expectations. But since the populism raises inefficiencies and therefore costs it shifts up the supply curve, while monetary tightening reduces demand, resulting in a large negative effect on output for little gain in reduced inflation. Therefore optimal coordination of monetary and fiscal policy requires the imposition of flexible rules that will constrain discretion and push it in the required direction (Goyal, 2002a, 2007). Fiscal surpluses should be built in good

times that are available to spend in bad, government expenditure capped at an expected trend growth rate, its composition changed to make it more effective. The Fiscal Responsibility and Budget Management (FRBM) Act 2003 will put some restraint on the fiscal laxity, but it does not really address the need to change the composition of government expenditure away from consumption and towards investment in infrastructure and human capital, and reduce waste. Even so it, together with more openness, may make it possible for monetary policy to be more in tune with the domestic cycle. Higher growth, lower interest rates, and the commitment to reduce the revenue deficit will eventually lower domestic public debt ratios. Public-private partnerships can help leverage public resources available for infrastructure and utilize them more effectively.

In the theory of monetary policy in an open economy (Clarida, Gali and Gertler, 2001) optimal policy is derived by minimizing deviations from potential output and from target inflation subject to three constraints. First, forward-looking aggregate demand, second, aggregate supply derived from firms equating wages to expected marginal product, and third, trader arbitrage over currencies linking changes in the exchange rate to real interest differentials over time. With such a framework, a short-run tradeoff between inflation and output variability arises only if inflation is positive due to a cost shock, since excess demand can be removed without output cost. This is trivially true for an economy such as India during a catch-up period of rapid productivity growth when potential output exceeds actual output. Moreover, monetary policy based on expectations and forward-looking behaviour has shorter lags; since fiscal policy must go through the political process, fiscal policy lags can be longer.

If the exchange rate is flexible there is automatic adjustment to a demand shock, since depreciation results and increases demand. Under a fixed exchange rate money supply automatically responds to money demand and financial market shocks in order to maintain the fixed exchange rate, but with a more flexible exchange rate this does not happen. So a monetary policy regime that allows a more automatic response to market conditions is required. Inflation targeting allows a learning from and response to the

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market, while anchoring inflation expectations. Targeting monetary quantities is inadequate as money demand becomes unstable.

As Dash and Goyal (2000) pointed out, information available in the systematic structural features can be exploited in designing monetary policy. Policy had been accommodating an agricultural shock but tightening as manufacturing prices rose subsequently and this had a large output cost. They argued that a monetary contraction should be completed earlier than in the past, and should coincide with a rise in food prices. But the open economy gives degrees of freedom because it turns out that a monetary relaxation, in response to an anticipated temporary supply shock, can appreciate the exchange rate, and thus reverse the impact of the supply shock (Goyal, 2005b). The administered price mechanism implies there is a lag between a supply shock such as a failure of rains or a rise in international oil prices and its impact on inflation. Forward-looking monetary policy can use its knowledge of this structure to abort the inflationary process. As long as supply shocks are the dominant source of inflation and deviations of output from potential harm welfare, optimal policy would aim to achieve an inflation target only over the medium-term by which time temporary supply shocks have petered out, or been countered by exchange rate policy, changes in tax rates, or improvement in efficiencies. Inflation targeting itself will prevent the inflationary wage-price expectations from setting in that can permanently shift up the supply curve in response to a temporary supply shock. Monetary policy has to tighten only if there is excess demand. Thus exchange rate policy and the management of inflationary expectations can help abort the relative price shocks that contribute to inflation, allowing monetary policy to maintain demand. In a situation of overall excess capacity and unemployment, tightening monetary policy to reduce supply-shock inflation has a high cost in terms of output sacrificed.

Indian financial markets have developed to the point that short-term interest rates are well integrated. Short-term forex market efficiency holds (Mohan, 2006). Therefore exchange rate expectations affect the interest differential. To the extent rapid catch-up implies the exchange rate is expected to appreciate, and the risk premium is low, domestic interest

rates can even be lower than international, giving more freedom to adapt monetary policy to domestic needs.

Conclusion

Limited volatility in exchange rates improves the structure of incentives, thus contributing to four objectives. First, external balance: a real exchange rate that follows its trend competitive value can stimulate the real sector, so that eventual current account surpluses follow initial deficits. Second, internal balance: smoother and more countercyclical interest rates can stimulate activity. Higher activity allows more inflows to be absorbed. Third, an appreciation is an antidote to price shocks coming from food, oil and other intermediate inputs, which are the typical temporary supply shocks the economy faces. These affect aggregate inflation through the wage-price process. For example, whatever the underlying trend, a steeper short-term appreciation can counter the supply-shock, contributing to control of inflation, thus allowing interest rates to be tuned to the macroeconomic output cycle.

A large voting population whose wages are not formally indexed to inflation implies political sensitivity to food price inflation. Administrative restraints are often put on prices of basic consumption goods. Since political pressure from farmers pushes up farm support prices, consumption subsidies are given. Since these are not complete, nominal wages respond with a lag to a rise in food prices leading to inflation. With more openness, world prices can restrain domestic food prices. An exchange rate policy that lowers domestic food price inflation through its effect on imported food prices also reduces the necessity for other distorting interventions. The resulting improvements in efficiency releases surplus, which can be used, for example, to provide better infrastructure for farmers. Therefore the policy is compatible with political constraints and the overall macropolicy objectives to lower inflation and raise growth.

The fourth benefit is stability in the external sector, and a fall in the likelihood of currency crises. Limited two-way movement of the exchange rate, creates incentives to hedge, reduces noise trader entry, and contributes to the deepening of forex markets.

If monetary policy is loose the currency is expected to depreciate, and a capital outflow occurs; but if it is too tight also high interest rates harm activity and a capital outflow can provoke the depreciation it fears. For well-behaved forex markets credibility of CB policy is essential. A policy that satisfies the four objectives, with appropriate support from fiscal policy, would be credible. Policy transparency such as through an inflation targeting regime gives sufficient discretion to allow flexible response to markets signals; but the transparent constraints on the discretion may be sufficient to prevent inflation expectations from setting in, even without monetary tightening.

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