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Alternatives to Inflation Targeting:

Central Bank Policy for Employment Creation, Poverty Reduction and Sustainable Growth

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ABSTRACT

Inflation targeting (henceforth IT) has emerged as a significant monetary policy framework in both developed and transition economies. Some authors have argued that for transition economies undergoing sustained financial liberalization and integration in world financial markets IT is an attractive monetary policy framework. The present paper evaluates the case for IT in India. It begins by stating the objectives of monetary policy in India and argues that inflation control cannot be an exclusive concern of monetary policy with widespread poverty still present. The rationale for IT is then spelt out and found to be incomplete. The paper provides some evidence on the effects of IT in developed and transition economies and argues that although IT may have been responsible for maintaining a low inflation regime it has not brought down the inflation rate itself substantially. Further, the volatility of exchange rate and output movements in transition countries adopting IT has been higher than in developed market economies. I then discuss India's experience with using rules-based policy measures (nominal targets) and discuss why India is not ready for IT. I show that even if the Reserve Bank of India (RBI) wanted to, it could not pursue IT since the short-term interest rate (the principal policy tool used to affect inflation in countries working with IT) does not have significant effects on the rate of inflation. The paper concludes by listing monetary policy options for India at the current time.

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I. Introduction

With around 20 central banks adopting it as their basic monetary policy framework inflation targeting (henceforth IT) has emerged as an important element in monetary policy design. Over time IT has become more flexible in its interpretation of target and permitted other goals to be included in the basic framework. Central banks have enhanced their communication with their respective publics about their targets and *modus operandi*.

Some authors have argued that for transition economies undergoing sustained financial liberalization and integration in world financial markets IT is an attractive monetary policy framework. Consequently there is pressure for such economies to adopt IT.

This paper evaluates the case for IT in India. It begins (in section II) by stating the objectives of monetary policy, especially that inflation control cannot be an exclusive concern of in a country with a substantial poverty problem. The rationale for IT and nuances of implementation are spelt out in section III. Section IV provides some evidence on the effects of IT in developed and transition economies and argues that, although IT may have been responsible for maintaining a low inflation regime, it has not brought down the inflation rate itself substantially. Moreover, the volatility of exchange rate and output movements in transition countries adopting IT has been higher than in developed market economies. Section V discusses India's experience with using rules-based policy measures (nominal targets) whereas section VI discusses some recent developments in the development of monetary policy in India. Section VII reviews some reasons why India is not ready for IT. Section VIII develops this further by arguing that, even if the Reserve Bank of India (henceforth RBI)— India's central bank —wanted to, it could not pursue IT since the short-term

interest rate (the principal policy tool used to affect inflation in countries working with IT) does not have significant effects on inflation. Section IX concludes and sketches the contours of an alternative to an IT policy. .

II. The Objectives of Monetary Policy in India

An overriding short-term concern of monetary policy is stabilization of the price level. However, India has had a long-standing problem of poverty and its alleviation has to be the cornerstone of the success of any policy including monetary policy. Higher economic growth, along with some supporting redistributive measures has a crucial role in reducing poverty. Dollar and Kraay(2001) show for a broad cross section of countries including India, that the incomes of the poorest 20 percent of the population rise in proportion to average income.[1] Growth seems to matter more than factors such as governance.

China is an important example of the poverty reducing effects of economic growth. (Table 1).

Table 1: Growth and Poverty Alleviation in China

Year	Annual poverty reduction announced by the government (10 thousand)	The growth rate of GDP per capita (%)	The growth rate of farmers' consumption level (%)	The growth rate of farmers' net income per capita (%)
1978–1985	1786	8.3	10.0	15.1
1985–1990	800	6.2	2.5	3.0
1990–1997	500	9.9	8.0	5.0
1997–2002	436	7.7	3.4	3.8
1978–2002	924	8.1	5.6	7.2

Source: *Chinese Statistical Abstract,* various issues.

[1] Even if the Dollar–Kraay result is discounted because of the well-known problems associated with cross-country regressions, at the very least there is no evidence that economic growth hurts poverty alleviation (Winters et al. 2002).

For almost three decades Chinese per capita GDP has grown at more than 8 percent per annum. Poverty has declined at an average of 9,240,000 persons per year.

In contrast India's growth and poverty reduction record has been less spectacular (Table 2).

Table 2: GDP and Per Capita GDP growth in India

	GDP growth (%)	
Period	Aggregate	Per-capita
1972–1982	3.5	1.2
1982–1992	5.2	3.0
1992–2002	6.0	3.9

Source: Kelkar (2004)

Because of lower growth the reduction in poverty in India has been far lower than in China despite the fact that inequality in China has grown more sharply than in India (Jha, 2004). India's national poverty headcount ratio fell only by about 12 percentage points over the 46-year period 1951–52 to 1997[2] and the rate of poverty reduction was higher in the 1980s than in the reform period, post 1991, indicating that the quality of growth in the 1980s was different from that in the 1990s, so that even with lower growth greater reduction in poverty could take place in the earlier period.

Further unemployment has been rising in the post-reform period. In the organised sector employment barely changed between 1991 and 2001; from 1997 it actually fell. Total employment (organised and unorganised) is growing at about 1 percent per annum - half the projected growth rate of the labour force. Consequently, the

[2] Results from the 1999–2000 National Sample Survey show a larger drop in poverty; however, this Survey's methodology does not match those of the earlier surveys. After correcting for the change in methodology the drop in poverty turns out to be modest. Results from the NSS round of 2004-05 which used the same methodology as that for 1999-00 confirm the relatively small drop in poverty.

unemployment rate for males in the rural sector rose from 5.6 percent in 1993-94 to 9 percent in 2004. In addition India also has substantial underemployment.

If India is to reduce poverty rapidly, its GDP must grow at 8 percent or more on a sustained basis. Kelkar (2004) has opined that growth could accelerate essentially because of a broad series of financial sector reforms, increased globalization and widening and deepening of product and financial markets, and beneficial structural changes — particularly on the supply side. In addition to its 'surplus labour' India is set to reap an important demographic dividend as the proportion of people in the working age group (15–64 age bracket) is expected to climb from 60.9 percent in 2000 to over 66 percent in 30 years. The labour force is less nutritionally deprived and increasingly literate. Economic theory and international experience indicate that this could lead to sharp rises in labour productivity and an upward shift in the trend rate of growth. However, this labour force has to be productively employed for these productivity gains to be realized. Given that adequate employment opportunities are not forthcoming political support for the reforms program (that has made the high growth possible in the first place) has waned (Jha, 2005).

Low interest rates (to enhance investment) and a slightly undervalued exchange rate with low volatility (to boost exports) are critical to sustaining high growth rates. An appropriate monetary policy must address these requirements.

III. Rationale for IT

The time inconsistency literature argues that a discretionary policy setting leads to higher long-run inflation without any gains in output (Kydland and Prescott, 1977;

Barro and Gordon, 1983). Since inflation has high costs the attraction of a rules-based policy to reduce the inflationary bias of discretionary monetary policy rises.

This preference has led to the adoption of nominal targets by central banks. Under a rules based regime central banks set explicit values for intermediate targets, which they can control, and which are strongly related to the ultimate goals of monetary policy (viz. stabilization of output and inflation), which cannot be directly controlled.

In recent times emerging market economies including India have experimented with three nominal targets: exchange rate, money supply growth and inflation.[3] The relative advantages/disadvantages of exchange rate and money growth targeting are portrayed in Table 3.

Table 3: Advantages and Disadvantages of the Nominal Anchors of Exchange Rate Targeting and Monetary Targeting.

	Anchor: Exchange Rate Targeting
Advantages	1. This fixes the inflation rate for internationally traded goods and thus directly contributes to keeping inflation under control. It is especially useful for sharply reducing inflation in emerging market economies. 2. If the exchange rate peg is credible, it anchors inflation expectations to the inflation rate in the anchor country to whose currency it is pegged. 3. An exchange rate provides an automatic rule for the conduct of monetary policy that avoids the time-inconsistency problem. 4. An exchange rate is simple and direct and, therefore, is well understood by the public.
Disadvantages	1. An exchange rate target leads to loss of independent monetary policy (Obstfeld and Rogoff, 1996). Hence the ability of the monetary authorities to respond to shocks is compromised. 2. The exchange rate peg may persuade large scale foreign borrowing. In the case of emerging market economies such loans are invariably denominated in foreign currency. Large accumulation of such loans may lead to a crisis. In most developed countries a devaluation may have little direct effect on the balance sheets (since debts are denominated in home currency) but not so in emerging market economies since debts are denominated in foreign currency. 3. Bernanke and Mishkin (1997) argue that exchange rate pegs can lead to financial fragility. 4. Although exchange rate targeting may be initially successful in bringing inflation down a successful speculative attack can lead to a resurgence of inflation.
	Anchor: Monetary Targeting

[3] Another intermediate target is nominal income. However this is both hard to target and poorly related to the ultimate objectives of monetary policy.

Advantages	1. An advantage over exchange rate targeting is that monetary targeting enables a central bank to adjust its monetary policy to cope with domestic considerations. 2. A monetary target is easily understood by the public — but not as well as an exchange rate target. 3. Monetary targets have the advantage of being able to promote almost immediate accountability for monetary policy.
Disadvantages	1. Typically the link between money growth and inflation is subject to long and uncertain lags. 2. The demand for money may not be stable, there may be instability of velocity and the money supply may not be controllable (Jha and Rath, 2003). This is especially true of broad monetary targets such as M2 or M3 and less so of narrow money.

Bernanke and Mishkin (1997) argue that IT, in contrast to exchange rate targeting but like monetary targeting, enables monetary policy to focus on domestic considerations and to respond to shocks to the domestic economy.[4] IT, like exchange targeting and unlike monetary targeting, has the advantage that people easily understand it. Since the central bank has a numerical inflation target, the chances of slipping into a time inconsistency trap are reduced. Svensson (1999) Bernanke and Mishkin (1997) and White (2004) argue that IT is 'decision making under discretion', combining rules and discretion, with central banks following a targeting rule which sets interest rates to reduce the deviation between conditional inflation forecast (the intermediate target of monetary policy) and the inflation target to zero over the target horizon.

In the context of an emerging market economy such as India the problem of monetary management in general and inflation control, in particular, get compounded by low policy credibility (Calvo and Mishkin 2003). This can lead to sudden stops of capital inflows making such countries prone to financial crises. It would be in their interest to adapt a rules-based monetary regime (like IT). Taylor (2002) argues that rules-based policies enhance the anticipation effects of monetary policy. Given less

[4] Another alleged advantage of an IT regime is that deviations from inflation targets are routinely allowed in response to supply shocks by excluding some combination of food and energy prices, indirect tax changes, terms of trade shocks and the direct effects of interest rate changes on the index. Following (or in anticipation) of a supply shock, such as a rise in the value-added tax, the normal procedure is for the central bank to deviate from its planned policies as needed and then to publicly explain the reasons for its action..

developed financial markets such anticipatory effects are likely to be lower. Yet monetary policy could still have considerable effects through movements of wages and property prices. With an IT regime in place this may be subject to lower shocks from the monetary regime.

However, the rationale for IT is incomplete. Kirsanova et al. (2006) show, in the context of UK, that an IT regime in itself cannot be considered to be an optimal monetary policy framework. No matter what price variable is used for IT an optimal policy response must include a terms of trade or exchange rate term. This argument is likely to hold with greater certainty for developing and transition countries such as India. Hence there can be no presumption that IT is the preferred monetary policy regime.

The mechanics of Inflation Targeting

The *modus operandi* of a typical IT regime is as follows. The central bank is not committed to any particular instrument arrangement and revises its inflation and output forecast at a frequency determined by monetary policy committee meetings using updated information. If the conditional inflation forecast is higher than the target, the central bank will raise the interest rate to minimize such deviation by the end of the targeting horizon, and vice versa. Households and firms then decide upon their consumption and investment plans. Blinder (1998) and Taylor (1993, 2002) argue that this is close to what many policymakers do in practice.

It has become common to compare ex post the actual setting of policy rates by central banks with what would have been predicted by the Taylor rule. The rule suggests that (short-term) interest rates (the federal funds rate in the US or the bank rate in India) should be changed in response to deviation of inflation from a target and an output gap. This is the so-called reaction function of central banks (Svensson, 1999, Clarida

at al., 1998, Mohanty and Klau, 2004). In applying his rule to the US for the 1987–92 period Taylor shows that this rule described the actual performance of policy well. In particular the addition of exchange rates or the level of money supply seemed to add little to its performance.[5]

IT is not applied mechanically and dose not focus only on current inflation but on containing inflation as a medium-term goal. Central banks pay attention to indicators that can predict future inflation (Bernanke and Mishkin, 1997).[6]

The choice of the price index to be use by an IT regime is critical. Typically the advice is to include a CPI or, preferably, a measure of core inflation that ignores excessively volatile prices e.g. food and energy.[7] Whether IT should respond to asset prices is debatable. Bean (2003) analyses how asset prices should enter into a monetary policy framework, given an objective function minimizing output gaps and deviation form inflation targets. He argues that a middle solution between completely ignoring asset prices and including asset prices regularly in the price index number be used for inflation targeting and that one should include asset prices in an IT framework only if these influence inflationary expectations.

Central banks now operate in an environment of considerable uncertainty about the functioning of the economy and global capital flows. Hence the conduct of monetary policy must be informed by examining a number of indicators and cannot rely on just one intermediate target — the rate of inflation. Most central banks – including those of developed countries - practice liquidity management involving

[5] In view of Kirsanova et al. (2006) this means that monetary policy has been sub-optimal.

[6] Seyfried and Bremmer (2003) discover that the Reserve Bank of Australia pays particular attention to inflationary pressures, as measured by the GDP gap. They find a relatively high degree of persistence and low speed of adjustment in the interest rate indicating that the cental bank is interested in interest smoothing in addition to inflation targeting. Similar evidence for other central banks is provided by Lomax (2005).

[7] India still does not have a single price index with widespread acceptability and suitable for IT. There is a wholesale price index and at least two consumer price indices. Measures of core inflation are not computed officially (Mohanty et al. 2000).

estimating market liquidity, autonomous of policy action, and initiate liquidity operations to steer monetary conditions. This framework has the advantage of permitting switching between quantitative targets and interest rate targets in response to macroeconomic circumstances. Most central banks try to build in automatic stabilizers in the liquidity management framework, e.g., by setting reserve requirements on an average basis to allow the financial system the leverage to adjust to temporary/seasonal liquidity shocks on its own account without central bank action and exercising an explicit preference for encasing short-term interest rates in a corridor around some optimal rate than at a point target. Hence the transformation of monetary policy in the wake of financial sector reforms is far from complete.

IV. The Performance of Inflation Targeting

There is considerable debate about whether IT improves performance in regard to inflation and output. Ball and Sheridan (2003) argue that the adoption of IT does not lead to a systematic improvement in the growth-inflation tradeoff, Hu (2004) argues otherwise. Fraga et al. (2003) concentrate exclusively on emerging market economies (including India) and show that economies working within an IT framework have higher volatilities of output, inflation, interest rates and exchange rates than developed countries using IT (Table 4).

Table 4: Volatility and Average of Selected Variables for 1997:1–2002:2 (quarterly data)

	Volatility of basic variables				Average	
Countries	Inflation	Exchange Rate*	GDP growth**	Interest rate	GDP growth	Inflation
Developed Economies						
Australia	2.05	0.13	1.96	0.58	4.78	5.89
Canada	0.83	0.04	1.30	1.14	3.57	1.96
Iceland	2.45	0.15	3.13	3.02	4.17	4.05
New Zealand	1.21	0.16	3.61	1.47	3.09	1.65

Norway	0.77	0.10	2.25	1.46	2.66	2.44
Sweden	1.11	0.12	2.41	0.44	2.58	1.24
Switzerland	0.54	0.08	1.14	0.92	1.79	0.85
United Kingdom	0.92	0.06	0.79	1.13	2.61	2.46
Average	1.24	0.11	2.07	1.27	3.16	2.57
Median	1.02	0.11	2.11	1.13	2.88	2.20
Emerging Market Economies						
Brazil	2.09	0.31	2.06	7.06	1.81	5.89
Chile	1.30	0.17	3.25	-	3.11	3.88
Colombia	5.43	0.25	3.38	10.02	0.81	12.51
Czech Republic	3.46	0.09	2.73	5.81	1.18	5.31
Hungary	4.09	0.16	-	1.13	-	11.21
Israel	3.18	0.10	3.36	3.34	2.98	4.35
Mexico	5.98	0.07	3.17	7.26	4.05	11.72
Peru	3.04	0.11	3.45	5.50	2.11	3.89
Poland	4.13	0.11	2.40	4.14	3.85	8.40
South Africa	2.13	0.26	1.11	3.65	2.26	6.51
South Korea	2.36	0.14	6.38	5.52	4.31	3.73
Thailand	3.25	0.14	6.13	6.72	0.08	2.88
Average	3.37	0.15	3.40	5.47	2.41	6.69
Median	3.22	0.14	3.25	5.52	2.26	5.60

Notes: * refers to the coefficient of variation (standard deviation/mean)
** growth rate measured comparing the current quarter to the same quarter of the previous year.

Source: International Financial Statistics, IMF (quarterly data)

Preparing for a switch to an IT regime requires considerable background work. Financial markets should be sufficiently developed and global capital markets should have adequate confidence in these markets, thus enabling the adoption of a sufficiently flexible exchange rate regime. All countries that have adopted IT have a high degree of central bank independence with considerable, if not total, freedom in setting monetary policy instruments and a minimal burden of financing government deficits. Further central banks should be able to use short-term interest rates as the main operating instruments and rely on well-developed financial markets to alter longer-term rates and transmit the effects of those changes to aggregate demand and inflation. Inflation targets are announced on the basis of forecasted inflation insofar as they represent a promise to offset the foreseeable deviations of future inflation from

the pre-specified targets over a period of one to two years. All countries using IT aim to enhance the credibility of the general macroeconomic policy by mutual agreement between the monetary and fiscal authorities about inflation targets and the associated need for fiscal restraint. Further, in most countries IT has been introduced when the inflation rate was already low — below 10 percent. Hence IT has contributed to building the credibility of the monetary mechanism and maintaining a low rate of inflation rather than bringing down inflation on its own.

V. Recent Indian Experience with Nominal Targeting

The RBI has never pursued a pure nominal targeting regime, opting for a combination of rules-based and discretionary measures with the rules-based target changing over time. In the 1980s and early 1990s India opted for the anchor of a nominal exchange rate peg, externally, and internally by monetary control. However, both these policy mechanisms have faltered. An inflexibly pegged exchange rate has proved to be unsustainable in the presence of strong capital flows[8] whereas the instability of the money demand function as well as its supply (Jha and Rath, 2003) indicates that monetary targeting, by itself, is no longer a feasible option.

Empirical evidence suggests that in emerging market economies such as India central bank interest rates react more strongly to changes in the exchange rate rather than changes in the inflation rate or output gap (Mohanty and Klau, 2004). Hence, at this point in time, it does not seem that the standard tool to target inflation — short term interest rate — is going to be particularly useful. In section VIII I buttress this

[8] Joshi and Sanyal (2004) indicate the RBI has been targeting REER of the Indian rupee with regard to the currencies of five countries, U.S.A., Japan, UK, Germany and France, at the 1993–94 level. Patel and Srivastava (1997) note that such targeting has had more than a transitory effect. Unlike in many Latin American countries REER targeting (even when requiring nominal devaluations) has not been particularly inflationary in India. However this benign relationship may break as reforms lead to greater capital mobility.

with estimates of a VAR model for India. It appears that even if the RBI wanted to it would be difficult for it to pursue a credible IT strategy.

Even assuming that IT does guarantee price stability does this guarantee the attainment of financial stability? RBI (2004) notes that the 1990s - a decade of relative price stability- witnessed a number of episodes of financial instability indicating that price stability is not a sufficient condition for financial stability. Large movements in capital flows and exchange rates affect the conduct of monetary policy continually. Thus financial instability impacts on the traditional tradeoff between inflation and growth. Bernanke and Gertler (2001) Bernanke (2003), Bean (2003), and Filrado (2004) have argued that even if price stability does not imply financial stability in the short run, a policy focused exclusively on price stability is still desirable since there is no evidence that such a policy would endanger financial stability. Price stability and financial stability would reinforce each other in the long run but in the short run central banks in emerging market economies would often face tradeoffs between the two. In an economy with relative price stability the interest rate should not remain passive (as it would in an IT regime) if the economy faces a sudden capital outflow. Thus RBI (2004) notes '(while) there is very little disagreement over the fact that price stability should remain a key objective of monetary policy, reservations persist[9] about adopting it as the sole objective of monetary policy' (pp. 56).

In the Indian case there is the further problem that the monetary authority faces a persistent fiscal overhang. The central bank does not have the option of not supporting a high fiscal deficit. If fiscal policy is imprudent and the central bank does not help finance the deficit, the end result would still be inflationary as the public

[9] See also Epstein (2004).

debt/GDP ratio would turn unsustainable in the medium term and the price level could at least partially be determined by the fiscal theory of the price level. [10]

Fiscal deficits are inflationary and put pressure on real interest rates and crowd out private investment (Engen and Hubbard, 2004). There is a vicious cycle between inflation and budget deficits — high deficits cause higher inflation, which raise interest rates, which then raise the deficit itself by raising debt service payments. Further, higher inflation reduces the real value of tax collections.

In the literature much emphasis has been placed on frameworks based on the clear mandates of central bank independence and fiscal responsibility legislation. Fiscal rules restrict unbridled government spending which checks the excessive build-up of deficits and public debt, which imparts stability to the economy. Concurrently fiscal rules may restrict the government's ability to take countercyclical policy measures and hence contribute to increased business cycle volatility. Overall fiscal policy rules are likely to be effective if accompanied by strong commitments and increased transparency (Bayoumi and Eichengreen, 1995). Hence there is widespread consensus in favour of central bank independence backed by fiscal discipline. Such clear-cut arrangements are essential pre-requisites to contain inflation and stabilize inflationary expectations.

Although price stability, output growth, reduction of exchange rate volatility and financial stability are the goals of monetary policy for the RBI none of these are under its direct control. The RBI sets intermediate targets which it can control and which have a stable relationship with the ultimate goals of monetary policy. A narrow target such as base money may be fully within RBI control but incapable of providing an effective means to pursue the ultimate objectives of monetary policy. A broad

[10] In Latin America Jacome and Vazquez (2005) find no causal relationship between central bank independence and inflation, although the association between the two is strong.

target such as nominal income may be closely related to the ultimate objectives of monetary policy but may not be amenable to RBI control. Both money supply and money demand have become unstable in India since the initiation of financial sector reforms. Other nominal targets have similar problems. Hence a purely rules-based monetary policy regime seems unhelpful.

VI. Recent Developments in Monetary Policy Design in India

With the progressive widening of fiscal deficits from the 1960s onwards, the burden of financing was borne by the RBI and the banking system. The support of the banking system to the Government's borrowing program took the form of progressive increases in the Statutory Liquidity Ratio (SLR) to 38.5 percent by the early 1990s. Although interest rates on government securities were steadily raised to enhance their attractiveness it became increasingly difficult to get voluntary subscriptions even at high rates of interest. Cash reserve ratio (CRR) was increased from 3 percent in the early 1970s to almost 25 percent (if incremental reserve requirements are taken account of) by the early 1990s. Nevertheless, liquidity growth remained excessively high during the 1970s and 1980s and later spilled over onto inflation. With expansionary fiscal policy there are limits to the effectiveness of monetary policy in containing inflation. The combined deficit of central and state governments has been close to 10 percent of GDP for more than 15 years and the share of net bank credit to the Government in financing the fiscal deficit remains high (hovering around 10 percent of GDP for much of the past decade).

The Chakravarty Committee on Monetary Policy constituted in 1985 recommended that price stability emerge as the 'dominant' objective of monetary policy with concomitant commitment to fiscal discipline (RBI 2002, pp. 67). Price

stability was seen to be critical to sustain the process of reforms begun in 1991 (RBI 1993). In the latter half of the 1990s, as the economy slowed down, monetary policy pursued an accommodative stance with an explicit preference for a softer interest rate regime while continuing a constant vigil on inflation. In the RBI's view there are several constraints in pursuing a sole price stability objective.

(i) The recurrence of supply shocks limits the role of monetary policy in the inflation outcome. Structural factors and supply shocks from within and abroad make inflation in India depend on monetary as well as non-monetary factors (McKibbibn and Singh 2003).

(ii) The persistence of fiscal dominance implies that debt management gets inextricably linked with monetary management.

(iii) The absence of fully integrated financial markets suggest that the interest rate transmission channel of policy is weak and yet to evolve fully. In particular the lags in the pass-through from the policy rate to bank lending rates constrain the adoption of inflation targeting.

(iv) High frequency data requirements including those of a fully dependable inflation rate for targeting purposes are yet to be met. (RBI 2004).

The RBI formally adopted a multiple indicator approach in April 1998. . These are (i) to maintain a stable inflation environment; (ii) to maintain appropriate liquidity conditions to support higher economic growth; (iii) to ensure orderly conditions in the exchange market; to avoid excessive volatility in the exchange rate; and (iv) to maintain a stable interest rate environment (RBI, 2002).

Besides broad money which remains an information variable, a host of macroeconomic indicators including interest rates, rates of return in different markets (money, capital and government securities markets) along with such data as on

currency, credit extended by banks and financial institutions, fiscal position, trade, capital flows, inflation rate, exchange rate, refinancing and transactions in foreign exchange available on high frequency basis are juxtaposed with output data for drawing policy perspectives in the process of monetary policy formulation.

The large list of indicators has been criticized as a 'check list' approach, which tends to water down the concept of a nominal anchor. However, it is very difficult to find a variable, which would be able to encapsulate the large number of factors which need to go into monetary policy making at this stage of transition from a relatively autarkic administered economy to a relatively open market-oriented one.

Short-term interest rates have emerged as instruments to signal the stance of monetary policy. The RBI uses a mix of policy instruments including changes in reserve requirements and standing facilities and open market (including repo) operations which affect the quantum of marginal liquidity and changes in policy rates, such as the Bank Rate and reverse repo/repo rates, which impact the price of liquidity. The RBI had originally conducted its monetary policy through a standard mix of open market operations and changes in the Bank Rate.

The liberalization of the Indian economy required a comprehensive recast of the operating procedures of monetary policy. The RBI shifted from direct to indirect instruments in consonance with the increasing market orientation of the economy. Further, shifts in monetary policy transmission channel necessitated policy impulses which would travel through both quantity and rate channels and the episodes of volatility in foreign exchange markets emphasized the need for swift policy reactions balancing the domestic and external sources of monetization in order to maintain orderly conditions in the financial markets. Even within the set of indirect instruments the preference is for more market-based instruments, e.g., open market operations.

Monetary authorities have to take cognizance of not only domestic but also external shocks and the RBI is required to monitor various segments of financial markets to ensure orderly conditions.

A more serious challenge to monetary policy comes from the capital account, especially the high volatility of capital flows vis-à-vis trade flows. Since external borrowings are denominated in foreign currency, large devaluations lead to inflation and cause serious currency mismatches with adverse effects on balance sheets of borrowers. The need for reserves as self-insurance emanates from the volatile nature of capital flows and reflects weakness in the existing international financial architecture. Capital inflows can reverse quickly leaving the country exposed to a liquidity crisis. In this context the distinction between 'push' and 'pull' factors becomes important. While 'push' factors attribute capital flows to conditions in creditor countries, the 'pull' factors refer to conditions in debtor (recipient) countries. India's ratio of net foreign assets to reserve money grew from 11.9 percent in 1990 to 44.5 percent in 1996, 65.8 percent in 2000 and 117.3 percent in 2003.

VII. India's unpreparedness for IT

That transition economies such as India may not be ready for IT is the considered view not just of the RBI but also IMF economists. Thus Masson et al. (1997) argue that economic structures in developing countries (including India) are incapable of supporting an IT regime in the short to medium runs, essentially because such countries do not satisfy a number of prerequisites for the successful implementation of inflation targeting. The authors consider these to be:

(a) **Independence of the central bank**

This refers not just to operational efficiency but also the policy space within which the RBI can operate. There are limits to the effectiveness of monetary policy in containing inflation in the face of expansionary fiscal policy. Domestic and financial markets should have enough depth to absorb the placement of public and private debt instruments; and the accumulation of public debt should be sustainable. In the Indian case while there is some evidence to suggest that the latter condition is satisfied (Jha and Sharma, 2004) the first is definitely not (Sharma, 2004). If these conditions are not all satisfied then the independence of monetary from fiscal policy is compromised — particularly at high rates of monetization of the deficit. The absence of fully integrated financial markets suggest that the interest rate transmission channel of policy is rather weak and yet to evolve fully.

In addition, the central government can, even in this age of financial liberalization, apply subtle pressure on the RBI to alter monetary policy. I give two instances of these. In the latter half of 2004 when inflation topped 8 percent in India and real interest rates had become negative, the RBI wanted to raise the bank rate to lower inflation but could not, under government pressure. Similarly in early 2005 the Governor of the RBI publicly voiced concern over volatile FII inflows and suggested a fiscal approach to capping them. However, the Finance Minister almost immediately rebuffed him.

b. Refraining from using any other nominal anchor

Another important requirement for the successful adoption of IT is that the authorities should desist from targeting any other nominal variable such as the exchange rate. As argued above, India needs to maintain a stable and competitive exchange rate to encourage exports. It is well known that even in developed economies, which have explicitly opted for it, IT is associated with a high degree of exchange rate flexibility.

In view of their vulnerability to exchange rate crises developing countries such as India should be wary of excessive exchange rate flexibility.

c. Predominance of demand as opposed to supply shocks

An implicit assumption behind IT is that monetary policy has to respond primarily to demand side shocks. Balakrishna (1991, 1992) has emphasized the role of supply side shocks in structuralist models of inflation applied to India.[11] These make inflation in India dependent on monetary as well as non-monetary factors. If there is a negative supply shock output falls and inflation rises. If the central bank follows an IT policy it will raise interest rates to lower inflation. The resulting drop in aggregate demand will further exacerbate the output drop. McKibbin and Singh (2003) demonstrate that because of the prevalence of supply shocks an IT regime is not suitable for India. If inflation rises because of a demand shock the pursuit of IT will stabilize both inflation and output. However, if inflation rises because of an adverse supply shock the pursuit of IT will exacerbate the recessionary effect on output by reducing demand.

d. Practical difficulties in the implementation of IT

The high frequency data requirements including those of a fully dependable inflation rate for targeting purposes are yet to be made (RBI 2004). Further, there appears to be consensus that demand side factors alone cannot explain inflation in India (Callen and Chang, 1999), thus making the case for use of an IT program tenuous.

VIII. Checking for Viability of IT in India

A prerequisite for the RBI to pursue IT is that there should exist a stable and significant relationship between the measure of inflation to be controlled and short-term interest rates. I test for this using monthly data over the period April 1992 to

[11] For a review of the literature on inflation in India see Callen and Chang (1999).

March 1998 from the RBI's ***Handbook of Statistics on the Indian Economy.*** The variables used are as follows:

1. IIP: Index of Industrial Production (1980-81=100)
2. REER: Index of real effective exchange rate (36-country), 1985=100
3. Namon: Narrow Money
4. Cmrate: Call money rate
5. Xrate: Exchange rate of Indian rupee vis-a-vis US dollar (monthly averages)
6. CPI: Consumer Price Index for industrial workers (1982=100)
7. WPITR20: Trimmed WPI (Source Mohanty et al. 2000)
8. WPI: Wholesale Price Index (1993-94=100)
9. WPIADM: Wholesale Administered Price index (Source Mohanty et al. 2000)

Monthly dummies were added to the time series and logs were taken of all variables except the call money rate. Augmented Dickey Fuller tests (not reported here to conserve space) indicated that all series are I(1).

To illustrate the bivariate relationships between the three candidate inflation measures and the monthly economic indicators, the P-values from bivariate Granger causality tests are presented in Table 5. Each entry in the table gives the P-values for the null hypothesis that the indicator does not cause the inflation measure — i.e., the probability of obtaining a sample, which is even less likely to conform to the null hypothesis of no Granger-causality than the sample at hand. Values smaller than 5 percent are presented in bold. Three measures of inflation are used — the CPI, WPITR20 (defined below) and a measure of administered prices (mainly fuel prices). These Granger causality results are reported up to eight lags.

The WPITR20 measure of inflation is developed as follows. Assuming that the WPI is the headline measure of inflation, as is the case in India, the trimmed mean inflation index can be expressed by the following formula:

$$WPITR_{\alpha} = \frac{1}{(1-2(\frac{\alpha}{100}))} \sum_{i=k+l}^{n-1} w_i \pi_i \qquad (1)$$

where $WPITR_{\alpha}$ is the trimmed WPI computed by ordering the component price change data π_I and their associated weights w_i and removing the components on each tail of the distribution by α percent. The number of components trimmed from the left and right tails of the distribution are *k* and *l* respectively. In the case of $\alpha = 0$ the trimmed mean would equal the weighted mean whereas in the case of $\alpha = 50$ it would equal the weighted median. The root mean square error (RMSE) for any level of trimming is defined by

$$RMSE_{\alpha} = \sqrt{\sum_{i=1}^{n} (p_t^{\alpha} - \pi_t)^2 / n} \qquad (2)$$

where p_t^{α} is the trimmed WPI with a trimming ratio of α percent from each of the tails of the price distribution at time *t*, π_t is the 36-month centred moving average change in WPI at time *t*, and *n* is the number of samples. Mohanty et al. (2000) conclude that this RMSE is minimized for α=20. This is what we use for our measure of core inflation in India. Data on this variable is available in Mohanty et al. (2000).

The results of the Granger causality test indicate a weak relation between the short-term interest rate (call money rate) and the measures of inflation. In fact only WPITR20 seems to have a causal relation with the call money rate. On the other hand the links between the measures of inflation and IIP, narrow money, exchange rate and

reer are much stronger. Hence the causality tests do not provide support for using interest rates as instruments in a policy of inflation targeting.

Table 5: P values from Bivariate Granger Causality Tests

CPI		IIP	Exrate	Narmon	REER	Cmrate
Lags						
	1	0.22	0.67	0	0.64	0.35
	2	0.4	0.72	0	0.99	0.43
	3	0.69	0.87	0	0.61	0.93
	4	0.1	0.5	0	0.46	0.8
	5	0.01	0.25	0	0.36	0.55
	6	0	0.13	0	0.26	0.58
	7	0	0.12	0	0.12	0.69
	8	0	0.16	0	0.03	0.82
WPITR20						
Lags						
	1	0.06	0	0.07	0.01	0.14
	2	0.01	0	0.01	0	0.09
	3	0	0	0	0	0
	4	0	0	0	0	0.04
	5	0	0	0	0	0.19
	6	0	0	0	0	0.2
	7	0	0	0	0	0.14
	8	0	0	0	0	0.26
WPIADM						
Lags						
	1	0	0.33	0.08	0.75	0.45
	2	0	0.09	0.01	0.56	0.23
	3	0	0.03	0	0.44	0.18
	4	0	0	0	0.2	0.97
	5	0	0	0	0.01	0.44
	6	0	0	0	0	0.41
	7	0	0	0	0	0.4
	8	0	0	0	0	0.12

Figures in Bold significant at 5% level

CPI Consumer Price Index
WPITR Trimmed whoesale price index
WPIADM Price Index for the administered goods
IIP Index of Industrial Production
Narmon Narrow Money
Exrate Exchange Rate Rs/$
Reer Real Effective Exchange Rate
Cmrate Call Money Rate

A drawback of the crude Granger causality testing is that it provides no information about whether the sign of the (dynamic) bivariate relationship is theoretically correct. While bivariate analyses give a rough indication of statistical relationships between inflation itself and leading indicators of inflation, omitted variables bias could distort the estimates significantly. I ran a VAR of the variables in STATA. The program retained the variables: lcpi, liip, lnarmon, lreer, cmrate. Table 6 reports on the Vector error Correction model, under the stipulation there are three cointegrating variables in the system.[12]

[12] Detailed results cane be obtained from the author.

Table 6: Vector Error Correction Model from VAR Estimation

	Coef.	*Std. Err.*	*z*	*P>|z|*		*Coef.*	*Std. Err.*	*z*	*P>|z|*
D_lcpi					D_lnarmon				
_ce1					_ce1				
L1	-0.07944	0.070814	-1.12	0.262	L1	-0.7398	0.198593	-3.73	0
_ce2					_ce2				
L1	0.023994	0.021023	1.14	0.254	L1	-0.12046	0.058957	-2.04	0.041
_ce3					_ce3				
L1	0.132008	0.071089	1.86	0.063	L1	0.140916	0.199365	0.71	0.48
lcpi					lcpi				
LD	0.131275	0.181922	0.72	0.471	LD	-0.18655	0.510191	-0.37	0.715
L2D	-0.23919	0.169483	-1.41	0.158	L2D	0.719971	0.475307	1.51	0.13
L3D	-0.00169	0.215543	-0.01	0.994	L3D	1.506578	0.60448	2.49	0.013
L4D	-0.05345	0.218963	-0.24	0.807	L4D	1.047828	0.614073	1.71	0.088
L5D	-0.34028	0.186329	-1.83	0.068	L5D	-0.04321	0.522552	-0.08	0.934
L6D	-0.44903	0.220185	-2.04	0.041	L6D	-0.36949	0.617499	-0.6	0.55
L7D	-0.40205	0.200613	-2	0.045	L7D	-0.51832	0.56261	-0.92	0.357
lnarmon					lnarmon				
LD	-0.02688	0.064869	-0.41	0.679	LD	-0.75277	0.181923	-4.14	0
L2D	-0.16421	0.075696	-2.17	0.03	L2D	-0.62109	0.212286	-2.93	0.003
L3D	-0.03529	0.072121	-0.49	0.625	L3D	-0.65593	0.202259	-3.24	0.001
L4D	0.035828	0.060855	0.59	0.556	L4D	-0.52284	0.170665	-3.06	0.002
L5D	-0.13562	0.058738	-2.31	0.021	L5D	0.020943	0.164727	0.13	0.899
L6D	-0.1029	0.064414	-1.6	0.11	L6D	0.123258	0.180645	0.68	0.495
L7D	0.057869	0.064654	0.9	0.371	L7D	-0.25163	0.18132	-1.39	0.165
lreer					lreer				
LD	-0.27617	0.073794	-3.74	0	LD	-0.26306	0.206952	-1.27	0.204
L2D	-0.3703	0.092663	-4	0	L2D	-0.37759	0.259871	-1.45	0.146
L3D	-0.20022	0.08892	-2.25	0.024	L3D	-0.48248	0.249372	-1.93	0.053
L4D	-0.27274	0.073683	-3.7	0	L4D	-0.55818	0.20664	-2.7	0.007
L5D	-0.21478	0.080797	-2.66	0.008	L5D	-0.40356	0.226592	-1.78	0.075
L6D	-0.21545	0.071716	-3	0.003	L6D	-0.4324	0.201124	-2.15	0.032
L7D	-0.1278	0.070095	-1.82	0.068	L7D	-0.4683	0.196579	-2.38	0.017
cmrate					cmrate				
LD	-0.00026	0.000579	-0.45	0.655	LD	0.005749	0.001624	3.54	0
L2D	-0.00038	0.000604	-0.64	0.525	L2D	0.00444	0.001695	2.62	0.009
L3D	-0.00094	0.00053	-1.77	0.076	L3D	0.002242	0.001487	1.51	0.132
L4D	-0.00141	0.000513	-2.75	0.006	L4D	0.001989	0.001438	1.38	0.167
L5D	-0.00117	0.000452	-2.58	0.01	L5D	0.000425	0.001268	0.34	0.737
L6D	-0.00061	0.00032	-1.91	0.056	L6D	1.42E-05	0.000897	0.02	0.987
L7D	-0.00026	0.000223	-1.17	0.242	L7D	0.00081	0.000626	1.29	0.196
liip					liip				
LD	-0.04796	0.10167	-0.47	0.637	LD	-0.8081	0.285128	-2.83	0.005
L2D	-0.02251	0.092856	-0.24	0.808	L2D	-0.50525	0.260411	-1.94	0.052
L3D	0.001402	0.080376	0.02	0.986	L3D	-0.1761	0.22541	-0.78	0.435
L4D	0.00135	0.066451	0.02	0.984	L4D	0.102729	0.186358	0.55	0.581
L5D	-0.01413	0.058448	-0.24	0.809	L5D	0.183835	0.163915	1.12	0.262
L6D	0.014915	0.048856	0.31	0.76	L6D	0.086086	0.137014	0.63	0.53
L7D	0.003105	0.027414	0.11	0.91	L7D	0.003843	0.076881	0.05	0.96
_cons	0.012931	0.003442	3.76	0	_cons	0.009592	0.009653	0.99	0.32

Table 6: Vector Error Correction Model from VAR Estimation (cont'd)

	Coef.	*Std. Err.*	*z*	*P>|z|*		*Coef.*	*Std. Err.*	*z*	*P>|z|*
D_lreer					D_cmrate				
_ce1					_ce1				
L1	0.23669	0.215595	1.1	0.272	L1	-9.2662	57.82143	-0.16	0.873
_ce2					_ce2				
L1	-0.04971	0.064005	-0.78	0.437	L1	25.56354	17.16572	1.49	0.136
_ce3					_ce3				
L1	-0.74058	0.216432	-3.42	0.001	L1	76.52269	58.04598	1.32	0.187
lcpi					lcpi				
LD	0.126411	0.553869	0.23	0.819	LD	91.91419	148.5447	0.62	0.536
L2D	-0.40329	0.515999	-0.78	0.434	L2D	-163.033	138.388	-1.18	0.239
L3D	0.164285	0.65623	0.25	0.802	L3D	-180.547	175.9973	-1.03	0.305
L4D	-0.38158	0.666645	-0.57	0.567	L4D	149.13	178.7906	0.83	0.404
L5D	-1.45388	0.567289	-2.56	0.01	L5D	-67.6367	152.1437	-0.44	0.657
L6D	-0.08419	0.670364	-0.13	0.9	L6D	-18.56	179.7879	-0.1	0.918
L7D	-1.08	0.610776	-1.77	0.077	L7D	91.90868	163.8068	0.56	0.575
lnarmon					lnarmon				
LD	-0.35526	0.197497	-1.8	0.072	LD	-95.0976	52.9677	-1.8	0.073
L2D	0.031007	0.230461	0.13	0.893	L2D	-68.2513	61.80825	-1.1	0.269
L3D	0.036477	0.219575	0.17	0.868	L3D	4.176049	58.8887	0.07	0.943
L4D	0.067441	0.185276	0.36	0.716	L4D	-77.564	49.68986	-1.56	0.119
L5D	0.170845	0.17883	0.96	0.339	L5D	-100.689	47.96118	-2.1	0.036
L6D	0.256766	0.19611	1.31	0.19	L6D	-12.5069	52.59573	-0.24	0.812
L7D	0.039763	0.196843	0.2	0.84	L7D	21.21489	52.79226	0.4	0.688
lreer					lreer				
LD	0.190545	0.224669	0.85	0.396	LD	-208.699	60.25501	-3.46	0.001
L2D	0.262241	0.282119	0.93	0.353	L2D	-120.102	75.66264	-1.59	0.112
L3D	-0.02626	0.270721	-0.1	0.923	L3D	-16.066	72.60589	-0.22	0.825
L4D	-0.05946	0.224331	-0.27	0.791	L4D	-117.275	60.16426	-1.95	0.051
L5D	-0.27537	0.245991	-1.12	0.263	L5D	-17.1516	65.97329	-0.26	0.795
L6D	0.023921	0.218342	0.11	0.913	L6D	-17.2904	58.55819	-0.3	0.768
L7D	0.121808	0.213409	0.57	0.568	L7D	-13.6142	57.23499	-0.24	0.812
cmrate					cmrate				
LD	0.003935	0.001763	2.23	0.026	LD	-0.68795	0.472923	-1.45	0.146
L2D	0.002514	0.00184	1.37	0.172	L2D	-0.45325	0.493473	-0.92	0.358
L3D	0.00029	0.001615	0.18	0.858	L3D	-0.77772	0.433042	-1.8	0.073
L4D	-2.98E-06	0.001561	0	0.998	L4D	-0.41319	0.418531	-0.99	0.324
L5D	0.000851	0.001376	0.62	0.536	L5D	-0.06012	0.369058	-0.16	0.871
L6D	0.000101	0.000974	0.1	0.917	L6D	-0.11483	0.261236	-0.44	0.66
L7D	0.000975	0.000679	1.43	0.151	L7D	0.17633	0.182181	0.97	0.333
liip					liip				
LD	0.510806	0.309539	1.65	0.099	LD	9.845296	83.01653	0.12	0.906
L2D	0.457648	0.282705	1.62	0.105	L2D	28.21744	75.82004	0.37	0.71
L3D	0.470819	0.244708	1.92	0.054	L3D	9.145638	65.62938	0.14	0.889
L4D	0.477246	0.202312	2.36	0.018	L4D	1.771472	54.25899	0.03	0.974
L5D	0.438266	0.177948	2.46	0.014	L5D	-0.14672	47.7246	0	0.998
L6D	0.273063	0.148744	1.84	0.066	L6D	23.42168	39.89235	0.59	0.557
L7D	0.038602	0.083463	0.46	0.644	L7D	0.188936	22.38441	0.01	0.993
_cons	-0.01987	0.010479	-1.9	0.058	_cons	-0.0002	2.810493	0	1

Table 6 (cont'd)

	Coef.	*Std. Err.*	*z*	*P*>|*z*|
D_liip				
_ce1				
L1	0.853878	0.430052	1.99	0.047
_ce2				
L1	0.402199	0.127672	3.15	0.002
_ce3				
L1	-0.15359	0.431722	-0.36	0.722
lcpi				
LD	-1.21458	1.104815	-1.1	0.272
L2D	-3.10089	1.029274	-3.01	0.003
L3D	-1.12249	1.308996	-0.86	0.391
L4D	2.452112	1.329771	1.84	0.065
L5D	-0.25746	1.131583	-0.23	0.82
L6D	-0.96154	1.337189	-0.72	0.472
L7D	-3.2064	1.218328	-2.63	0.008
lnarmon				
LD	-1.17364	0.393952	-2.98	0.003
L2D	-0.75912	0.459705	-1.65	0.099
L3D	-1.61192	0.43799	-3.68	0
L4D	-0.23846	0.369573	-0.65	0.519
L5D	-0.42517	0.356716	-1.19	0.233
L6D	0.068239	0.391186	0.17	0.862
L7D	-1.19182	0.392647	-3.04	0.002
lreer				
LD	-0.42598	0.448152	-0.95	0.342
L2D	-0.61895	0.562748	-1.1	0.271
L3D	-1.31204	0.540013	-2.43	0.015
L4D	-0.22143	0.447477	-0.49	0.621
L5D	-0.90564	0.490682	-1.85	0.065
L6D	-1.02694	0.435532	-2.36	0.018
L7D	-0.80851	0.425691	-1.9	0.058
cmrate				
LD	0.001816	0.003517	0.52	0.606
L2D	0.00086	0.00367	0.23	0.815
L3D	-0.00173	0.003221	-0.54	0.591
L4D	-0.00314	0.003113	-1.01	0.313
L5D	-0.00522	0.002745	-1.9	0.057
L6D	-0.00404	0.001943	-2.08	0.038
L7D	0.001187	0.001355	0.88	0.381
liip				
LD	0.769114	0.617443	1.25	0.213
L2D	0.880477	0.563919	1.56	0.118
L3D	1.152687	0.488125	2.36	0.018
L4D	0.94987	0.403556	2.35	0.019
L5D	1.019589	0.354956	2.87	0.004
L6D	0.878757	0.296703	2.96	0.003
L7D	0.511007	0.166486	3.07	0.002
_cons	0.012779	0.020903	0.61	0.541

Figure 1 shows that the confidence band for the impulse response function of cmrate on lcpi is very wide, hence adding to our agnosticism about the efficacy of inflation targeting in India.

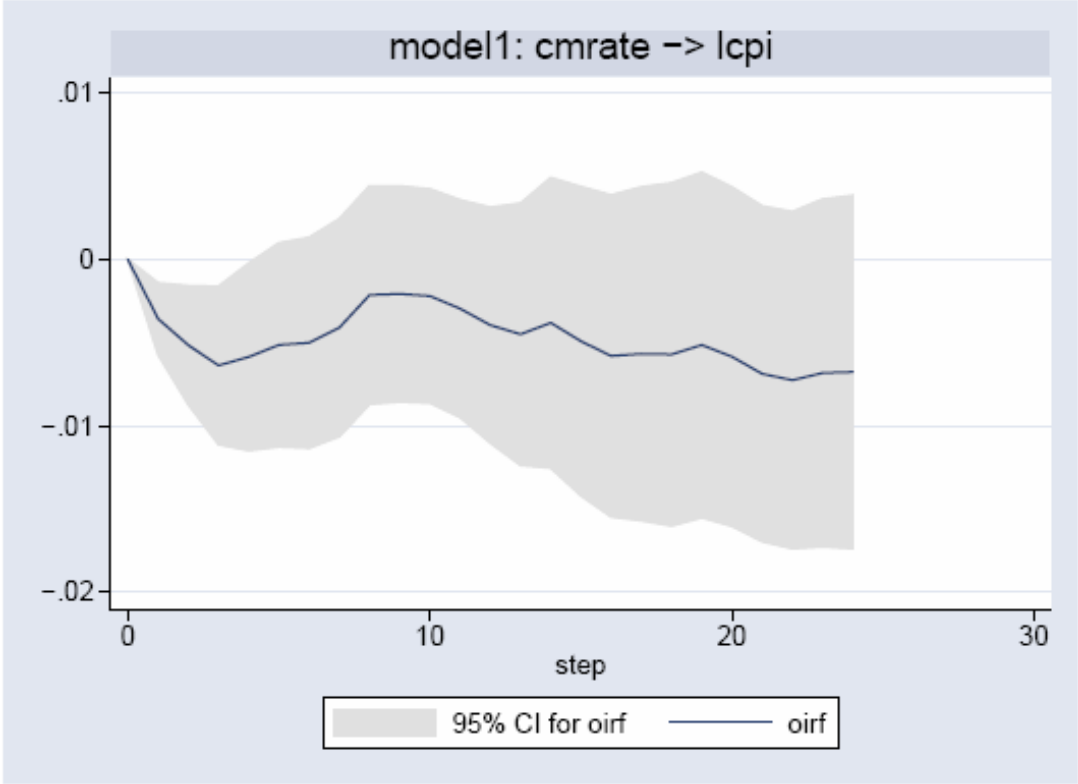

Figure 1

The ECM for lcpi is not significantly responsive to any of the error correction terms. Hence it appears that inflation targeting may be difficult to pursue in the Indian context.

IX. Conclusions: Options for IT in India

This paper has argued that the primary objective of Indian monetary policy, at least in the medium term, has to be the attainment of higher economic growth. Moreover, since India has high inflation aversion, this objective does not conflict with that of short-term stabilization.

The design of monetary policy in India is circumscribed by the fact that the liberalization of financial markets is far from complete so that the interest rate transmission channel is incomplete. Further the banking system has strong monopoly elements and the government owns overwhelming stake in the banking sectors. Further, as the financial sector liberalizes some major government owned mutual fund operations have had to be bailed out. The development of such contingent liabilities along with the already high fiscal deficit exacerbates monetary policy difficulties in the Indian context with no respite in sight.

Monetary policy in India has to be conducted against this background. This paper has argued that the multi-objective formulation pursued by the RBI has merit and that such monetary policy should be pursued to maintain stable interest and inflation rates and a slightly undervalued currency in order to engineer higher export led growth.

This policy has, however, led to substantial capital inflows with attendant build-up of reserves and necessitated considerable sterilization operations. This has now emerged as a significant problem with its continuance at the current pace seemingly unsustainable if for no other reason than the fact that such reserves attract low yields. At the current point in time two policy packages to address this issue have been discussed. The first is geared towards fiscal correction and monetary expansion. A second policy measure is weighted towards real exchange rate appreciation (more in line with IT) and would involve relatively larger current account deficits. Real appreciation, in turn, could be secured by nominal appreciation or by permitting higher inflation. Both policies would lead to low inflation rates and reduced inflows of foreign capital and, therefore, lower accumulation of reserves at given rates of sterilization. Policy packages that use import liberalisation would, like real

appreciation, permit higher absorption via higher current account deficits but without penalising exports. The optimal package for India is a judicious combination of these two broad sets of policies with greater emphasis on fiscal consolidation and import liberalisation, rather than real exchange rate appreciation via nominal appreciation or inflation. These are essential elements of an appropriate monetary policy regime for India.

Since rapid export growth is important, it makes sense to err on the side of undervaluation of the exchange rate. This would enable India to capture a larger share of world markets. Growing exports, in turn, raise the incentive to invest. The propensity to save also rises in response to the increased profitability of export-oriented investment. Moreover, an undervalued exchange rate is likely to boost saving by raising the share of profits in national income. This argument should not be read as implying that unlimited real depreciation is feasible or desirable just that there should be a bias towards mild undervaluation because it can play a supportive role to complementary outward-oriented trade policies in generating a virtuous circle of higher saving, investment, and growth. Along this path import demand would grow concomitantly and getting a current account surplus is not inevitable.

Clearly India has been conducting some form of real exchange rate targeting leading to a sharp rise in foreign exchange reserves. Some authors, e.g., Lal et al. (2003) indicate that this has come at high economic costs – a claim that has been successfully disputed.[13] . The pursuit of IT would require India to pursue a clean float

[13] Lal et al. (2003) argue that India's growth rate in the 1990s could have been up to 2.7 percent per annum higher if the foreign exchange inflows during the decade had been fully absorbed. This has been disputed by Joshi and Sanyal (2004). If net foreign inflows had been absorbed domestic spending (and not foreign exchange reserves) would have risen. Reserves as a proportion of GDP rose over the 1990s by an average of about 1.2 percent per annum. If the entire increase in reserves had been absorbed into investment each year, the ratio of investment to GDP averaged over the decade would have been 1.2 percent higher than it actually was. Given fixed ICOR (of 2.8 in the 1990s) the increase in India's growth rate of GDP would have been only 1.2/2.8 = 0.4 percent per annum (approx.) higher over the decade. This sacrifice would be even lower if (i) the ICOR would have risen (in line with the

reducing the need for lage reserves. But the price to be paid is the possibility of a highly unstable or inappropriate exchange rate. India's policymakers were wise to reject this regime and opt for managed floating plus selective controls on capital flows. However, reserves are now at a very comfortable level but are continuing to rise at a rapid pace. The question of whether and how to absorb foreign inflows is far more pertinent now than it was in the 1990s.

Clearly sterilisation has outlived its usefulness.[14] Some sterilised reserve accumulation can continue to maintain the present ratio of reserves to GDP. Further increases in the ratio should be avoided except as a purely short-term response to manifestly short-term inflows. The policies espoused here have the advantage that in addition to promoting balance of payments adjustment, they are desirable independently of the balance of payments and of the 'temporary' or 'permanent' character of the inflows. Naturally, due to political constraints, these policies can only be pursued at a moderate pace. If there is continued acceleration of inflows, despite the adoption of the suggested strategy, the government should consider tightening capital inflow controls[15] so that the strategy is not derailed. The appendix to this paper underscores the importance of capital controls in insulating India from the 1990s Asian crisis although its fundamentals were no better than those of many of the worst affected countries. Hence the use of selective capital controls should be an integral part of India's monetary policy framework. A corollary would be that capital account convertibility is eschewed.

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assumption of diminishing returns to capital). (ii) Some of the reserve accumulation spilled over onto higher consumption, thus reducing the growth rate. (iii) Furthermore, the level of foreign exchange reserves in India was inadequate in 1991. Building up of foreign reserves from that low base was necessary.

[14] The recent rise in petroleum prices and the inability to raise domestic prices has widened the trade deficit thus providing a potential role for the accumulated reserves.

[15] Through a Chilean-type tax, for example.

It is not being suggested that India should resist an exchange rate appreciation indefinitely. Once Indian GDP has grown in excess of 8 percent for more than two decades so that real incomes have gone up substantially and unemployment and poverty have dropped sharply India could contemplate changes in the monetary policy regime essentially in the direction of relaxing the undervaluation of the exchange rate. However, even at that point, given the importance of variables other than inflation in an optimal monetary policy framework, there would be no argument for moving to IT.

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Appendix:
Capital Controls: or why did India escape the East Asian crisis?

It is instructive to compare India and the East Asian countries in 1996 (i.e. just before the East-Asian crisis of 1997). The first six columns of Table A1 indicate that, in most respects, India's 'fundamentals' (fiscal balance, inflation, current account balance, non-performing assets, debt-exports ratio and debt-service ratio) were worse or no better than the crisis-countries. All these countries were on loose dollar pegs. India was only marginally different from the rest except for the fact that India did not allow its real exchange rate to appreciate.

The critical difference between India and the crisis-countries can be seen in the last two columns of Table A1. India managed to keep short-term debt under control, both in relation to total debt and in relation to foreign exchange reserves and thus avoided an unstable debt structure, an outcome that was the direct result of controls on debt-creating short-term inflows.

India was able to resist the pressure to adopt capital account convertibility because of three reasons: first, the ideology of *laissez faire* is still not dominant in India, second, foreign banks, which are normally a strong pressure group in favour of capital account convertibility, had a very small presence. Finally, India was 'too big to be bullied' into adopting capital account convertibility by Wall Street, the IMF and the U.S. Treasury (Joshi and Sanyal 2004).

Table A1

Various Countries: Indicators of Crisis-Vulnerability, 1996

	FB/GDP (%)	ΔP/P (% p.a.)	CAB/XGS (%)	NPA (%)	NCEDT/XGS (%)	TDS/XGS (%)	SDT/EDT (%)	SDT/RES (%)
India	-9.0	9.0	-11.7	17.3	103.6	21.2	5.3	27.1
Indonesia	-1.0	8.0	-13.0	8.8	180.5	36.6	25.0	166.7
Korea	0.0	4.9	-14.6	4.1	82.0	9.4	49.4	192.7
Malaysia	0.7	3.5	-6.4	3.9	40.4	9.0	27.9	39.7
Philippines	0.3	8.4	-9.9	n.a.	80.1	13.4	19.9	67.9
Thailand	0.7	5.8	-19.5	7.7	110.9	12.6	41.5	97.4

Notation

FB/GDP: Fiscal Balance as a proportion of GDP
ΔP/P: Rate of Consumer Price Inflation
CAB/XGS: Current Account Balance as a proportion of exports of goods and services
NPA: Non-performing Assets of commercial banks as a proportion of total advances
NCEDT/XGS: Non-Concessional External Debt as a proportion of exports of goods and services
TDS/XGS: Debt Service as a proportion of exports of goods and services
SDT/EDT: Short-term external debt as a proportion of total external debt
SDT/RES: Short-term external debt as a proportion of foreign exchange reserves

Sources

FB/GDP, NPA: Bank of International Settlements Annual Reports 1997/98 and 1999/00 and Government of India, Economic Survey, 1999/00
CAB/XGS, NCEDT/XGS, TDS/XGS, SDT/EDT, SDT/RES: World Bank, Global Development Finance 1999
ΔP/P: I.M.F. International Financial Statistics