

# **EXCHANGE RATE MANAGEMENT**

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By

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## Table of Contents

	Page No.
<b>I. INTRODUCTION</b>	<b>1</b>
<b>II. EXCHANGE RATE AND EXPORTS</b>	<b>1</b>
<b>III. EXCHANGE RATES AND IMPORTS</b>	<b>3</b>
<b>IV. FOREIGN TRADE EQUILIBRIUM</b>	<b>4</b>
<b>A. FREE FLOAT</b>	<b>5</b>
<b>B. FIXED RATE</b>	<b>5</b>
<b>C. TEMPORARY SHOCKS</b>	<b>6</b>
<b>D. LEADS AND LAGS</b>	<b>6</b>
<b>E. FUTURES and FORWARDS in FE</b>	<b>6</b>
<b>F. CONCLUSION</b>	<b>7</b>
<b>V. EXCHANGE RATE MANAGEMENT</b>	<b>7</b>
<b>A. FREE FLOAT</b>	<b>8</b>
<b>B. Fixed Rate</b>	<b>9</b>
<b>C. Managed Float</b>	<b>10</b>
<b>D. MERCANTILISM</b>	<b>12</b>
<b>VI. REMITTANCES</b>	<b>12</b>
<b>VII. CAPITAL FLOWS AND EXPECTATIONS</b>	<b>13</b>
<b>VIII. TRADE IMBALANCE</b>	<b>15</b>
<b>IX. EXPECTATIONS &amp; CONTAGION</b>	<b>15</b>
<b>X. OPERATIONAL POLICY</b>	<b>16</b>
<b>A. MARKET</b>	<b>16</b>
<b>B. FUNDAMENTALS</b>	<b>16</b>
<b>C. VOLATILITY &amp; SPECULATION</b>	<b>17</b>

## **I. INTRODUCTION**

Given the complexity of the subject of exchange rates, their effects and determinants, it is not surprising that Public debate has been marked by a lot of confusion and half-truths. Before addressing the very difficult issue of exchange rate management in an open and free economy, it is useful to get some of the basic facts straight. We start with the issues on which economic theory and evidence is relatively strong, and gradually move on to aspects and issues in which judgement and intuition plays a greater role. The next two sections address the basic issue of the effect of real exchange rate on exports and imports.<sup>1</sup> Section 4 deals with the effect of exchange rate on the trade balance and the different exchange rate regimes. Section 5 addresses the issue of exchange rate management in a Goods and Services (trade) economy. Section 6 introduces remittances into the system. Section 7 introduces capital flows and market expectations into the economic picture. Section 8 and 9 very briefly consider how to deal with “excess capital inflows”(trade imbalance) and contagion (outflows).

## **II. EXCHANGE RATE AND EXPORTS**

The exchange rate affects exports. The real exchange rate is the relative price of the source country’s goods relative to the price of goods in the destination country. A rise in this relative price must have a negative effect on exports in a free market. The degree to which this happens will in general vary from country to country and commodity to commodity. The overall effect of a country’s exchange rate on its total exports is therefore an empirical question.

In India’s case, a careful empirical study by Virmani (1991) showed that it is necessary to separate exports into three categories: Manufactures, Primary

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<sup>1</sup> They can be skipped by anyone already convinced that the exchange rate has a significant effect on imports and exports, particularly of manufactures.

and others, if we want an accurate estimate of this effect. India's Manufactured exports were found to be most responsive to changes in the real effective exchange rate (REER). As they constitute over 70% of exports this is a fact that cannot be ignored. It is also found that the effect of very large changes in the exchange rate such as the 1966 devaluation take at least two years to work through to their full impact. One therefore expected a similar lag in the effect of the 1991 devaluation on exports.

World demand represented by world GDP (or World imports) also has a strong effect on our exports of manufactured goods; about 60% of the effect is within the same year, while the rest is in the subsequent year.<sup>2</sup> On the supply side, domestic output of manufactured goods and rainfall were both found to raise the supply price of exports. The former leads to a tightening of the Infrastructure constraint and thus has a negative effect on exports. The latter works through the supply of agricultural goods in a situation in which there were a host of import and export controls on agricultural produce. Other factors such as productivity changes, technological upgrade and foreign direct investment will also affect export growth over the medium term. These are, however, very difficult to quantify and therefore to use in an econometric equation.

A simple examination of the data for the past five-six years suggests that the 1991 devaluation took 2-3 years to have its full impact. It also suggests that the sharp fall in the rate of growth of exports in 1996-7 was due both to a substantial fall of world import growth (one third to half depending on the index used) and a gradual real appreciation of the rupee due to higher inflation in India. The lag would be shorter in this case of gradual change than in the case of major devaluations. A word of caution, however: Simplistic graphical

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<sup>2</sup> The export demand equation explained between 54% and 62% of the variance as measured by the R square.

analysis can be highly misleading if we ignore the lessons of the more rigorous empirical studies.

The above-mentioned study also showed that the effect of changes in the real effective exchange rate on Primary exports was found to be quite weak.<sup>3</sup> There are two reasons for this. During the estimation period (up to 1990) agricultural exports were subject to controls, Quantitative Restrictions and restrictions, which themselves underwent ad hoc changes. This dampens the elasticity. A similar dampening results if the main producer-exporter is a public sector company subject to non- market pressures, such as in the case of certain minerals. As controls and restrictions on agricultural exports are eliminated (and replaced by duties in some cases) we would expect agricultural exports to be equally if not more responsive to exchange rate changes. Supply side factors such as rainfall will play a very important role in agricultural exports, and we expect a strong positive correlation between the level and quality of rainfall and the volume of imports.

The above-mentioned study did not examine the effect of changes in the real effective exchange rate of competitor countries on our exports. We have tentatively identified China, Indonesia, Philippines, Pakistan and Thailand as our closest competitors for manufactured exports.

### **III. EXCHANGE RATES AND IMPORTS**

Exchange rate changes also have an impact on import demand, which is the opposite of that on exports. The effect of exchange rate on Indian imports was found to be lower for manufactured goods and higher for Primary goods (than the impact on exports). Primary goods imports, however, were less responsive than manufactured imports. This was again due to the relatively higher degree of import controls on agricultural, than on manufactured inputs

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<sup>3</sup> The explanatory power of the equation was nevertheless higher at R square of 0.93.

and capital goods over the period of estimation. Both manufactured and primary imports are found to be more sensitive to domestic inflation than to the exchange rate. The amount of discrepancy is however much more pronounced in the case of primary goods, primarily because imports were largely a planning (political) decision, which is very sensitive to high domestic inflation. In a freer and competitive market the discrepancy is likely to be reduced considerably.

Manufactured import growth is also affected by the growth in domestic product. The effect of growth in the manufacturing sector is however about two third larger than that of growth in the Agriculture and allied sector. As expected, imports of agricultural goods are strongly related to rainfall over the period of estimation.

#### **IV. FOREIGN TRADE EQUILIBRIUM**

At this stage, it is useful to consider the issue of exchange rates and exchange rate policy in an economy in which the balance of payments consists largely of exports and imports of Goods and Services (international shipping and insurance). It is assumed that the capital account is controlled and capital flows consist largely of foreign aid, and can thus be treated as fixed and exogenous.

The foreign exchange market in such an economy is relatively easy to depict and analyse. The demand for foreign exchange arises from the importers of goods and services, which can be linked to the analysis and estimates presented in the previous section. Similarly exporters provide foreign exchange supply, and the estimates given in section 2 would show the factors, which will determine this supply. The price of foreign exchange in this market is the exchange rate. If the market is free the demand and supply of foreign exchange will determine its price, just like in any other market.

### **A. FREE FLOAT**

As in a more complex economy the government has three options with respect to the (real) exchange rate regime: Freely floating, fixed rate with large occasional re-valuations and managed float. Consider first a freely floating regime. If the inflation rate of the country is greater than that of its trading partners, and productivity growth is similar, the nominal exchange rate must steadily depreciate in such a regime. Differentials in productivity, and particularly in the productivity of non-tradable services, can partially counter or enhance this depreciation. Similarly, if there is a drought, net exports of agricultural exports will fall, and the nominal exchange rate will depreciate to restore equilibrium in the market. A rise (fall) in the rate of growth of the world economy will lead to increased (reduced) demand for exports, and trigger a nominal appreciation (depreciation) to restore equilibrium.

### **B. FIXED RATE**

If the regime is one of fixed nominal exchange rate, then an adverse inflation differential, a drought or a slow down in the world economy must lead to a decline in reserves. The decline in reserves will continue as long as the situation continues subject to the exhaustion of reserves, or their replenishment through some emergency infusion of aid funds. A fixed exchange rate policy is therefore not a viable option if there is a permanent adverse change in one or more exogenous variables. Both the fixed rate regime and the managed float can be considered in the context of temporary or short-term shocks. The fixed rate regime is viable if the country has large reserves and is subject to a lot of small temporary shocks. In this situation foreign exchange reserves would be built up during positive shocks and run down during negative ones. The occasional large adverse relatively longer lasting shocks would have to be met by occasional large devaluation.

### ***C. TEMPORARY SHOCKS***

In any real world situation, and with some exceptions (e.g. periodic droughts), it is often difficult to know for sure whether any particular shock is a temporary short-term one. In this situation a managed float can be a better policy, and can also be considered. In this case one would keep the exchange more or less fixed as long as it appeared that the shock might be temporary letting reserves run down. At some point, depending on the speed of reserve run down and the firming judgement about the likely length of the adverse shock, allow the currency to float down gradually, by decreasing or stopping the amount of reserve sale.

### ***D. LEADS AND LAGS***

Leads and lags in the system can accentuate the effect of short-term shocks and thus increase the relative advantage of a managed float. Even in an economy with a completely closed capital account, importers and exporters of goods and services can slow down or speed up the remittance of foreign exchange to and from the country. This can accentuate the effect of shocks and lead to overshooting. Thus in a free floating regime an adverse shock will lead to an anticipation of depreciation, a slowing down (speeding up) of inward (outward) remittances and thus add to the pressure of depreciation even before there is any significant effect on actual imports and exports. In this case the currency may initially depreciate sharply and then gradually appreciate back to the old level, as the effects of the shock are complete. A managed float can reduce this overshooting by releasing foreign exchange into the market when expectations start to change and buying exchange when the appreciation starts.

### ***E. FUTURES and FORWARDS in FE***

This argument carries weight only if foreign exchange futures and forward markets are non-existent or inefficient. Arguments for a managed float

are therefore as much arguments for developing futures and forward markets. An efficient futures and forward market coupled with dissemination of information available to the government could substantially dampen the over-shooting from the lead-lag phenomenon. As exporters would be able to sell their exchange in the forward market reflecting the likely depreciation over time.

## **F. CONCLUSION**

It is very important to note that in the context of the analysis so far the base situation is one in which the exchange rate is allowed to fluctuate freely to the dictates of the market. Prima facie it is clear that this is the best system for ensuring market equilibrium in response to fundamental changes. It will however involve a certain amount of volatility and perhaps over-shooting. The question of using an alternative system therefore only arises if volatility has adverse impacts on exports or other real economic variables, and this volatility can be reduced by alternative methods of managing the exchange rate. Any such presumed advantage would have to be set against the possibility that adjustment to fundamental changes may be less accurate or slower in the alternative system.

## **V. EXCHANGE RATE MANAGEMENT**

We are looking at what may be called a G&S economy, an economy where we can focus on trade in goods and services and ignore expectation based flow of factors. So far we have looked at the equilibrium in the foreign exchange market, assuming that other items such as domestic output to be given from outside (i.e. a partial equilibrium analysis). But macro variables such as output, inflation and foreign exchange can in principle affect each other. There is a condition called the Marshal-Lerner condition, which must be satisfied if the results of the previous section given hold when all (endogenous) variables in

the economy interact and are simultaneously determined. Doubts have been expressed whether these conditions hold in the case of hyperinflation economies. There is however a broad consensus that these conditions do in fact hold in the case of moderate inflation economies such as India. More particularly, the experience of previous devaluations in India has demonstrated that these equilibrating conditions do in fact hold. We can therefore be quite confident about the relevance of the previous section's analysis.

#### **A. FREE FLOAT**

As a genuinely free float means that the price determination is left to the market, the central bank should follow a totally non-interventionist role in the market for exchange rate if foreign exchange markets, including futures and forwards are complete and reasonably efficient. The exchange rate would appreciate or depreciate depending on the nature of the internal and external shocks. In a managed float one may have the option of bringing about a much more gradual depreciation of the currency than is likely to happen in a free floating regime. The presumption is that market participants have as much if not more information and competence as the Central bank. Any special information that is available with the Central bank or Government can always be made available, along with any analysis which government feels is required for making rational decisions. In this kind of situation I would strongly recommend that exchange rate determination be in fact left to the market.

For comparative purposes it is useful to see what would happen in this market if there were a reduction in the foreign aid. The real effective exchange rate must depreciate by such an amount as to reduce the trade deficit by an amount equal to the reduction in aid. The required depreciation depends on the responsiveness of exports and imports to this change. As soon as the facts about aid reduction become known, the market would know that this requires a reduction in the current account deficit, and this in turn requires a depreciation

of the rupee. There would consequently be a fairly rapid adjustment of the market exchange rate. This in turn would mean that importers and exporters would get an immediate signal to reduce imports and increase exports respectively.

If markets for foreign exchange (as in the case of India) are thin and futures and forward markets not well developed a very mild form of managed float, which most observers would still call a free float could be used. The Central bank would focus on intra day and inter day volatility. A virtually automatic system of intervention could be set up for dampening volatility. This would involve a central rate and a narrow price band of the order of 1 to 2.5%. The central band would be an average of the exchange rate over the past year (or last few months), while the band would be based on the daily and weekly variation over the same period. The central bank would buy and sell reserves during the day to restrain the exchange rate from going outside the band. At the end of the day the central rate would be adjusted in based on a formula, which took account of the position at the end of the day and the net sale/purchase of reserves.

Taking again the case of the anticipated decline in foreign aid, the adjustment in this case would be stretched out and the response of importers and exporters delayed, with a consequent loss in reserves. This cost would, however, be offset by the gain from reduced volatility arising from the mismatch between exchange inflows and outflows in a thin market.

### **B. Fixed Rate**

The fixed rate regime has already been described in the previous section. In an economy wide context the monetary effects of this system also need to be considered. Any change in foreign exchange reserves is accompanied by a corresponding change in base or high-powered money. Thus an expansion in FE reserves will lead to expansion of money supply and inflation. The latter

would result in a real appreciation of the currency, thus eventually restoring equilibrium in the market for foreign exchange. If monetary expansion is thwarted through sterilisation measures, inflation may be contained close to old levels, but financial market dis-equilibrium and reserve gains would continue. There could also be adverse effects on production and growth in an economy such as ours, because of existing unemployment and under-employment.

Similarly a reserve reduction would tend to bring a monetary contraction, a rise in interest rates and a squeeze on investment and production. Because of the so-called “downward stickiness of prices” there would be an additional cost in terms of lost output and employment. This price could be quite high if the change in fundamentals is large. If the contraction in money supply is resisted by expanding domestic reserves, thus maintaining monetary growth, employment and growth may continue at old rates. Reserve losses would, however, continue till a crisis ensues.

### ***C. Managed Float***

It is useful to see how a managed float would function in this economy. The real effective exchange rate is the key concept around which exchange rate management must revolve in this system. The first problem is therefore to define a benchmark period for the real effective exchange rate. This would be a recent year or twelve month period during which the current account deficit matched the externally determined capital inflows i.e. reserves were constant. There are two basic issues in exchange management in this context. The response to a change in fundamentals, and the management of short-term changes and cycles, till such time as one can determine whether a change in fundamentals has taken place.

Any change in fundamentals would require a change in the real effective exchange rate. When it is clear that an adverse change in fundamentals has taken place, the best option is a nominal depreciation of the exchange rate. If

this is accepted, the managed float merely provides an opportunity of slowing down the adjustment to equilibrating real effective exchange rate. The speed of this adjustment has to be decided by evaluating the trade off between adjustment smoothing and reserve losses. If the market knows information (about aid reduction say), this will involve even greater loss in reserves than the modified free float. To the extent that this is done by suppressing information that becomes available to the government before becoming public knowledge, there will be no loss of reserves. In my view, therefore, the market must be allowed to depreciate in response to an adverse change in fundamentals.

In the case of a positive change in fundamentals such as an improvement in the terms of trade, equilibrium can be restored through either a nominal appreciation or an increase in inflation. Thus the managed float provides a genuine option of absorbing part of the change in the form of reserve build-up with partial sterilisation. The degree and timing of the reserve build-up and the extent to which it is sterilised will depend on the nature of the change requiring a policy response. Thus the basic medium term approach to exchange management (response to fundamental changes in the economic environment) must be an asymmetric one, mirroring the price asymmetry, which characterises the economy. That is to allow nominal depreciation in response to an adverse change, while using a combination of a reserve build-up [and partial sterilisation] and nominal appreciation in response to a positive change.

It is seldom known with certainty whether a fundamental change has occurred and how long it is likely to last. The problem that a policy of managed float must therefore address is the difficulty of distinguishing between short run fluctuations and temporary changes on the one hand from longer lasting and more permanent changes. This translates into the challenge of determining the reserve losses one should be willing to sustain in the face of a market, which is moving steadily in the direction of depreciation. The broad medium term

approach must therefore be combined with short-term rules for intervention. This is essentially a variant of the approach mentioned earlier for reducing daily and weekly volatility. This would include a price band, combined with reserve loss limits and rules for adjustment of the band at the end of each day.

#### ***D. MERCANTILISM***

Public debate on the issue of exchange rate has confused two issues.

- (a) The appropriate exchange rate response to an adverse change such as a fall in external demand: This analysis starts from a position of approximate balance, and the issue is one of policies needed to restore the balance. Our discussion in this note is focused on this issue.
- (b) The use of the exchange rate as a mercantilist tool for generating growth or employment. This issue is even more complex, as the precise nature of the initial imbalance and its causes must first be defined. This cannot be done without going into the fields of growth theory and the theories of full employment, under-employment and capacity utilisation. This red herring should therefore be ignored while considering the problem of exchange rate management.

## **VI. REMITTANCES**

The goods and services model ignores the issue of labour export and earnings remittances, which have grown in importance since the oil shock. One of the important new issues that arise in this context is the ease with which this remittance can be diverted to the hawala market. Channelling of imports or exports into the hawala market requires mis-declaration on officially submitted declarations, and therefore has greater probability of detection. In the case of hawala there is no such official record, and it is virtually impossible to detect either the remitter or receiver of foreign exchange. Only the intermediary has some probability of detection.

The existence of such remittances therefore raises the volume of foreign transactions, which can be slowed or expedited. It also makes a part of the foreign exchange subject to a free float through the Hawala market. The market therefore becomes a dual one, and one has to be alert to the possibility of policy actions leading a shift from the legal to the hawala market and vice versa. With the exchange rate reforms over the last five years, the hawala premium has declined. This has shifted much of the remittance to the legal market, with the result that the level of remittances has jumped substantially.

## **VII. CAPITAL FLOWS AND EXPECTATIONS**

The introduction of private capital flows transforms the nature of the foreign exchange markets. It is helpful to start by considering a situation in which only foreign direct investment is allowed, but can go freely in or out. Such investment generally has long-term horizon, and must therefore be based on projections about the future development of the economy. Expectations therefore enter the picture. By their very nature expectations depend both on the fundamentals of the economy but also on intangible factors such as social and political conditions and personal attitudes. Though the fundamental determinants of direct investment are known, the quantification of the impact of different variables is found to be much more difficult than in the case of imports and exports. There is also no way precisely to determine the importance that will be attached to the intangible factors at any given time (there is no theoretical framework). Expectations can therefore have a highly variable effect on the flow of direct foreign investment. From experience we have learnt, however, that political uncertainty, social upheaval and perceptions of governmental indecisiveness or incompetence has a negative effect on expectations.

The second important effect is that the exchange rate is no longer determined by what happens on the trade account. Certain factors, which determine the trade balance, may have a balancing effect on capital flows, while other may enhance the imbalance. For instance a deterioration of the terms of trade will worsen the trade balance, while at the same time making it less attractive for foreign investment to flow in. This will magnify the needed exchange rate adjustment. In other cases the change may be self-equilibrating or affect only one side of the balance of payments.

The third effect of private investment flows is that the exchange rate and its future evolution is an important factor in determining the profitability of foreign investment, and therefore on the amount of investment flows. This introduces circularity into the determination of exchange rates, which can magnify the effect of fundamental or other changes.

The problem of expectations is greatly accentuated as private financial capital flows are allowed. Not only are expectations variable, but these can now have enormous effect on the flows of capital over a very short time. Both the maximum effect and the time period over which this can happen depends on the degree of freedom given or on the openness of the capital account. Thus a new phenomenon of asset bubbles and collapses, stock manias and crashes enters the picture, and can lead to sudden dramatic changes in the capital flows.

From the perspective of exchange rate management policy there are two new issues, which arise with the introduction of private capital flows. One is the possibility of the current account balance and the capital balance moving in different directions (capital flows increase, CAD declines] or substantially out of step (capital flows increase more than the current account) over the medium term (5 years say)]. The second issue is the approach one should adopt towards management of changes in demand and supply of foreign exchange arising from sharp changes in expectations.

## **VIII. TRADE IMBALANCE**

The first problem is best addressed through a specific example. Suppose a change in the control regime coupled with economic reforms lead to a rise in capital flow that are expected to be sustained for at least five to ten years. After this it may stop and perhaps even reverse gradually. If all markets functioned perfectly this would involve an appreciation of the exchange rate, a significantly lower growth of exports and a higher trade deficit over these 5 to 10 years. The case for a free float regime rests on the argument that as long as the economy grows at its full potential, and there are no arguments to the contrary, there is no need to worry about exports or the trade balance per se. If and when the capital flows slow or cease, the exchange rate will depreciate, exports will pick up and the trade balance will improve to the extent needed. The counter case for a managed float is based on the argument of hysteresis and some form of partially irreversible damage to export industry. Thus in a managed float regime, the central bank would allow only part of the effect to be passed through directly to the market, by accumulating reserves during this 5-10 year period. My recommendation would be to start progressively reducing the amount of reserves purchased by the central bank after six months, even if one is reasonably certain that the capital flow will last for only five years. It would be more helpful to focus on strengthening the general competitiveness of the economy to meet any challenge after five years.

## **IX. EXPECTATIONS & CONTAGION**

The second problem is one of a sharp change in expectations. In my view no economy can stand up very long to the pressures on the exchange rate unleashed by very sharp changes in expectations. The management problem is therefore not one of resisting such changes but of minimising negative feedbacks & overshooting, and trying to obtain as soft a landing as possible. In our

case, this would have been much easier if the basic system was in equilibrium before the new developments in Asia. There has however been a sharp drop in exports since November 1996 suggesting that the real effective exchange rate may have shifted out of equilibrium. Recent reserve losses and net outflows on FII account would strengthen this conclusion. It would therefore appear that an adjustment to the real effective exchange rate benchmark of 1993-4 is likely. The challenge would be to keep it from overshooting the March 1993 real effective exchange rate benchmark, in the light of spreading contagion to S. Korea and possibly even Japan.

## **X. OPERATIONAL POLICY**

There are three basic elements of exchange rate policy at this juncture.

### **A. MARKET**

We must believe and state publicly that the exchange rate will be determined by the forces of demand and supply in the market for foreign exchange. This means some mix of reserve accumulation and moderated nominal appreciation in the upward direction, coupled with accelerated policy reform to free imports of goods services etc., and downward (depreciation) flexibility in the exchange rate. Any absolute commitment to use foreign exchange reserves to fight market forces pushing depreciation would be foolhardy, and very likely to fail in the current period of global turmoil.

### **B. FUNDAMENTALS**

Government exchange rate policy must focus on the Medium term fundamentals. Since November 1996, when export growth collapsed, this has meant that we **must allow** the nominal exchange rate to depreciate whenever there is an excess demand for dollars. This must be are approach as long as the

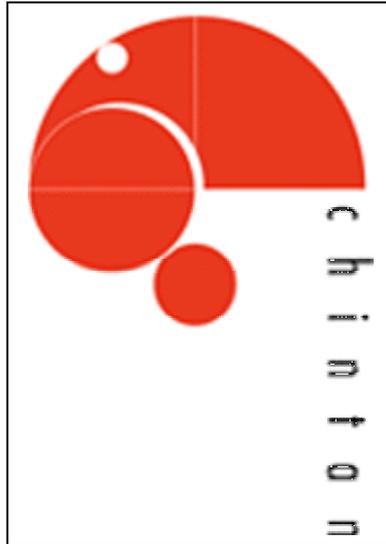
rate of growth of exports does not reach a respectable value (Max.) (World, LDC, South East & East Asian export growth)].

A possible range for fundamental depreciation is the range between the mean REER of the 1993-94 10 country index i.e. a nominal rate of Rs 40.25/\$ [as of august 1997] and the nominal rate based on the March 1993 average REER.

We should also weave our belief in the fundamentals of the market into our public statements, without ever committing ourselves to any particular number for the exchange rate. The statement of a former high official of RBI about Rs. 37.50/\$ being consistent with fundamentals, and the Economic Times report stating that Rs. 38.5/\$ is consistent with the fundamentals can make it more difficult to manage speculative pressures and expectations. At any given time we can only have a range of exchange rate consistent with our perception of fundamentals. This perception must be continuously crosschecked with the market, so that our perception of fundamentals incorporates the markets' perception of fundamentals.

### ***C. VOLATILITY & SPECULATION***

Over the short term, the RBI/government's objective, actual and publicly stated, has to be to dampen volatility and speculative pressures. It is important to make this clear to the market. Any particular action by RBI can then be interpreted as directed at reducing volatility and/or speculation. Even if RBI is acting on the basis of its understanding of fundamentals, it need not make this too explicit.



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