CHAPTER 5

SUMMARY OF FINDINGS, POLICY SUGGESTIONS AND DIRECTIONS FOR FURTHER RESEARCH

5.1. Introduction

The noteworthy change is the sharp increase in the cross-border capital flows as a result of financial liberalization during the last two decades has significantly made management of exchange rate a difficult task. The liberalized capital flows across economic and political borders has contributed to wide-ranging of crises with varied intensities and frequencies. The exchange rate stability has come always under attack whenever a sudden stop or reversal of capital flows occurred and triggered more exchange rate volatility. More importantly, there is a significant rise in the precautionary demand for reserves in order to tide over the crises experienced by emerging countries in the 1990s. Some of the recent empirical studies on reserve demand provide evidence in favour of this claim.

Nevertheless, it must be underlined here that large reserve holding Asian countries such as China, Taiwan, South Korea, etc are still maintaining a number of restrictions on capital flows as it would restrict the external vulnerability. In fact, the emerging Asian countries maintain administrative controls to limit capital flight while providing incentives to encourage strong capital inflows. Such asymmetric capital controls has been an integral part of exchange rate management policy of emerging countries. Under this arrangement, capital inflows tend to be long-lasting which will keep persistent pressure on domestic currency to appreciate. Therefore, the available option for authorities which have concern for export growth is to intervene in foreign exchange market to prevent real appreciation of domestic currency.

Further, on the one hand, central bank’s intervention in the foreign exchange market through various channels has been used to reduce exchange rate volatility. On the other hand, changes in foreign exchange reserves also provide signaling mechanism
to calm down the volatility and lessen uncertainty in exchange rate. However, the literature on the empirical side is meager and inadequate and that gap is filled up partially in this study.

In India too, the large accumulation of reserves appears to be an eventual outcome of a shift in policies on reserve and exchange rate management in respect of growing transactions on the capital account and for varied reasons the reserves have been built up. Firstly, a country needs reserves to pay for its import and to service external debt anticipating a temporary shortfall in export earnings or denial of access for foreign exchange. Secondly, reserves are built up as insurance against sudden stops or reversal of foreign capital. Thirdly, the authority may accumulate reserves to prevent real appreciation of domestic currency as it would help sustaining export growth. The first motive reflects the transaction demand while the second motive reflects the precautionary demand for reserves. The third motive describes the mercantilist view that reserve accumulation is triggered by concerns over export competitiveness. There is also another beneficial effect arising out of accumulation of foreign exchange reserves, i.e., it plays a role to control exchange rate volatility.

However, accumulation of larger reserve holding has its own costs. Having realized the existence of such opportunity cost, authorities have laboured themselves to determine the adequacy of reserves. There are number of criteria adopted to determine the same. The reserve adequacy was often determined by simple rule of thumb that the stock of reserve should be at least equivalent to the imports of a few months (Triffin, 1960). Conventionally, reserves equivalent to three months of import was considered to be adequate. This was widely accepted when the cross-border capital flows were absent and on a lesser scale. The amount of reserves so held largely serves as precautionary balance to absorb shocks in external payment. Such shocks arise when there is an unforeseen mismatch between external receipts and payments. However, with the recent surge in capital flows the profile of accumulation of official reserves by the emerging countries has undergone a seesaw changes and they cannot be fully explained by the conventional reserve adequacy indicators.
Besides the problems, caused by volatility in cross-border capital flows, efforts have been also made to link reserve adequacy with external debt position. For instance, Guidotti (1999) and Greenspan (1999) suggested that the level of reserves should be equivalent to short-term external debt which will be due next one year, while average maturity of external debt should be three years and above and hence countries must maintain liquidity at risk. Alternative measures of reserve adequacy which are incorporated in the Report of Committee on Capital Account Convertibility by S.S.Tarapore (2006) therefore suggest wide range of indicators, namely, debt-based, money-based and trade-based indicators.

While a number of adequacy indicators emerged in response to growing intensity and frequency of financial crises all over the world, there is rich theoretical literature which deals with determining the optimal level of reserves, of which the buffer stock model of Frenkel and Jovanovic (1981) is noteworthy, as it offers valuable insight.

5.2. Summary of findings

Going back to the crux of the thesis, i.e., to empirically verify whether holding large foreign exchange reserves will help reduce exchange rate volatility, two channels have been identified and adopted based on two different theoretical perspectives, as mentioned in introductory Chapter. They have been empirically investigated in Chapter 4 and the results reported.

Firstly, Guha’s (2008) theoretical perspective has been adopted as a reference for empirical Exercise I. Here, the percentage change in foreign currency assets is used to test whether change in reserves stock has contributed to reduction in exchange rate volatility via signaling channel. The other explanatory variables used are interest rate differentials and net FII as percentage of BSE market capitalization.

The variables, interest rate differential, measured as the difference between 3-month US Treasury bill and 91-days Indian Treasury bill rate, is used to capture the effect of short-term movements in debt component of capital flows and net FII as percentage of BSE market capitalization is used to capture the effects of short-term
movements in equity component of capital flows, based on uncovered interest parity under asset approach to foreign exchange market.

The GARCH(1,1) models for percentage change in exchange rate have been estimated for different combinations of explanatory variables along with percentage change in foreign currency assets. It is found that the model with all the three explanatory variables, namely, percentage change in foreign currency assets, interest rate differentials and net FII as percentage of market capitalization, yielded significant estimates. The negative signs in the coefficients of all the explanatory variables indicate that all these variables negatively affected exchange rate volatility. It means that, the important variable in study, namely, the percentage change in reserve stock, has significantly explained the variance of exchange rate and has also reduced exchange rate volatility. This means further that the reserves appear to have signaled the market forces about the information with regard to stability of exchange rate and the ability of central bank as the ultimate authority, to maintain stability in the foreign exchange market in the process of reserve accumulation. The changes in reserve stock levels are also seen to change the expectations of the market players about the future exchange rate movements on an average by improving the market sentiment thereby bringing an orderly condition in the foreign exchange market.

The negative impact of other two variables, namely, interest rate differentials and net FII as percentage of market capitalization that captures the effect of capital flows, on exchange rate volatility can be explained by the asymmetry in the policy perspective on capital flows pursued by India, i.e., capital outflows are restricted while capital inflows are freer.

Secondly, the empirical study carried out by Hviding, Nowak, and Ricci (2004), which provides a sophisticated line of reasoning that high level of reserves help reduce exchange rate volatility through a signaling effect, i.e., via creditworthiness, has been adopted as a reference for the empirical Exercises II and III. Based on this argument the explanatory variables considered are ratio of reserves to broad money and ratio of reserves to imports which are chosen as proxies for reserve adequacy indicators in two different Exercises II and III respectively. Additionally, interest rate differential, measured as the difference between 3-month US Treasury bill and
91-days Indian Treasury bill rate is used to capture the effects of short-term movements in debt component of capital flows based on the uncovered interest parity under the asset approach to foreign exchange market. This variable is chosen as the creditworthiness portrayed by the adequacy of reserves is expected to cushion the disorderly condition in foreign exchange market so as to bring favourable market sentiment about the country’s credibility to honour the debts.

In Exercises II and III, two GARCH (1,1) models for percentage change in exchange rate have been estimated separately using the two proxies for reserve adequacy indicators as key explanatory variables.

The first GARCH (1,1) model using ratio of reserves to broad money as a proxy for reserve adequacy indicator alone did not yield significant results. But the combination of interest rate differentials along with ratio of reserves to broad money yielded significant estimates.

Similarly, the second GARCH (1,1) model using ratio of reserves to imports as a proxy for reserve adequacy indicator alone did not yield significant results. But the combination of interest rate differentials along with ratio of reserves to imports yielded significant estimates.

Thus, as stated earlier, all the three explanatory variables have significantly impacted on the variance of exchange rate and have reduced exchange rate volatility.

It implies that the process of reserve accumulation to higher levels serves as a signaling channel ensuring orderly condition in foreign exchange market via creditworthiness factor by changing the market sentiment, i.e., by improving investor confidence.

The signaling effect operating via creditworthiness channel as indicated by reserve adequacy measures, portraying comfort level of reserve accumulation, have proved more meaningful in providing cushion so as to maintain an orderly condition in the foreign exchange market by reducing exchange rate volatility significantly.
The results of all the three major models of Exercise I and II show that the coefficients of variance equations in GARCH(1,1) models with the inclusion of new explanatory variables are consistent with a reduction of persistence in volatility.

To sum up, the level of reserves in the process of accumulation have a calming effect on foreign exchange market, as the potential for foreign exchange intervention may reduce the willingness of financial operators to take bets on the exchange rate.

The results acquired warrant an illustration on the recent depreciation of Indian rupee as a post-script discussion.

5.3. Post-script developments – A comment

The current situation based on the data and developments in mid-2013 still show a grim state of affairs on depreciating exchange rate to another historical low with Indian rupee falling to 59 and beyond per US dollar. Although, the reasons behind rupee depreciation with respect to domestic factors are as similar to the previous year with huge capital outflow arising out of negative sentiments, the principle reason is the huge increase in current account deficit in the year 2011-12 which stood at 5.4% of GDP. In addition, the currency depreciation will lead to other problems, mainly, inflationary pressures, which may add fuel to the already persisting high inflation in the economy.

In spite of that, it is considered as a temporary phenomenon and commented that the “Indian rupee is not in a shambles” by Raghuram Rajan, the Chief Economic Advisor to the Government of India, as the important factor that is attributed to this rupee fall is the general appreciation experienced by the US dollar against other major currencies and more particularly against the euro. The US dollar has been appreciating as a consequence of downgrading of two French banks and huge withdrawal of deposits from European banks resulting in huge selling of euro and buying of US dollars.
But, the government’s pitch towards fiscal consolidation as envisaged in the budget 2013-14 brings relief as it is expected to bring down fiscal deficit to 4.8% of GDP in 2013-14 which stood at 5.3% by end-March 2013. This will also ease inflation to a greater extent which has already shown signs of decrease of few basis points in April and May 2013 on the Consumer Price Index (CPI). Moreover, India’s debt is within manageable limits and can be indicated by the external debt to GDP ratio of 20% and debt service ratio of 5.6% at end-March 2012, indicating that India still continues to be within the less vulnerable countries when it comes to external debt indicators compared to that of the indebted countries. In addition, the comfort position portrayed by reserve adequacy indicators scaled by any variable that causes risks show that India can mitigate any shock emerging from external factors.

5.4. Policy suggestions

The conventional measures of volatility/variability for exchange rates obtained by historical standard deviation/rolling standard deviation method provides equal weight to historical observations and hence the estimates are biased; therefore, any decision based on such biased estimates will be misleading. Instead, the volatility measures obtained from ARCH/GARCH models are appropriate.

In the process of understanding the relationship between the accumulation of foreign exchange reserves and exchange rate volatility, in the world characterized by openness to speculative capital flows, it is of critical importance that the role of reserve stock must be taken into consideration while shaping the expectations about future exchange rate in order to reduce exchange rate volatility.

In addition, the process of reserve accumulation must be as influential as it tends to reduce exchange rate volatility and must take into account the credibility indicators against short-term capital reversals.

5.5. Directions for further research

The observed exchange rate data used for volatility modeling would also have the impact of intervention component which might have resulted in providing biased
estimates. Hence, the impact on exchange rate volatility that operates via the use of reserves to intervene in the foreign exchange market can be tested for further research alongside with signaling of “comfort level” which indicates a greater potential for foreign exchange intervention. In this respect, a proxy for central bank intervention that captures policy intentions could provide further insights in this line of research. Further research would be needed to identify the channels through which the higher reserve levels are working.

The impact of reserves adequacy on exchange rate volatility can be verified for different episodes, mainly for the sample period, 1997-2002, when Asian Financial crisis started and 2002-2007, when there was a huge surge in capital inflows and appreciation of exchange rate was experienced and 2007 onwards when Global Financial crisis started. Moreover, the level of foreign exchange reserves surged to unprecedented levels only after 1997 for which the reserve adequacy phenomenon can be effectively verified for currency volatility.