

Chapter 7: Conclusions & Policy Inferences

The results of the analysis show that the consequent to the liberalization of the capital account in early 1990s, capital flows in India have been associated with appreciation of the real effective exchange rate. Further the volatility of capital flows has been found to be significantly linked to the volatility of the real exchange rate. This evidence indicates that the increasing volume and volatility of these flows have adverse consequence such as loss of competitiveness of the export sectors, inflationary pressures leading to lowering of profitability of producers, widening of trade deficit and shock to the real economy. As is the case with many emerging market economies, challenges posed by capital flows have elicited multiple policy responses from the Indian Government and the monetary authority (Reserve Bank of India) to manage these flows and to mitigate the stress imposed by them on the real economy through appreciation of real exchange rate and an increase in volatility of the real exchange rate. The policy responses include foreign exchange market intervention and subsequent sterilization, greater flexibility of exchange rates, phased liberalization of the policy regime for current and capital account outflows, (capital controls) prudential norms etc.

7.1 Inferences for policy on Foreign Exchange Market Intervention and Sterilization:

The Reserve Bank of India (RBI) has regularly intervened in the foreign exchange market to neutralize the impact of large capital flows on the exchange rates. As unsterilized forex market intervention can lead to monetary expansion and the consequent inflation, a loss of competitiveness and a loss of monetary control, RBI has taken measures to offset the impact of such foreign exchange intervention through sterilization. The sterilization operations to mop up excess liquidity in the market have included measures such as repo and reverse repo auctions under the day-to-day Liquidity Adjustment Facility (LAF), outright sales of government securities through Open Market Operations (OMOs) and building up of surplus balances of the government with the RBI (Mohan, 2008) particularly by raising the notified amount of 91-day Treasury Bill, auctions and forex swaps. As a result of large capital flows and the consequent market-based operations, the quantum of securities with the RBI declined progressively. In 2004 RBI introduced innovation in the form of Market Stabilization Scheme (MSS) for sterilization. Under the MSS, the Reserve Bank of India issues/redeems/buys back government treasury bills/bonds to neutralize the impact of capital inflows. The fiscal impact is transparently borne

by the Government. During the period of excess capital inflows there is a simultaneous increase in the holdings of the RBI's foreign exchange reserves and the stock of securities issued under MSS. The interest expenses incurred by the Government on account of issuance under MSS are offset by transfer of earning on the foreign currency assets by the RBI to the Government as surplus profit transfers. The MSS allows absorption of surplus liquidity by instruments of short-term (91-day, 182-day, and 364-day T-bills) and medium term (dated Government securities) maturity. In response to the tightening of domestic liquidity brought about by the global financial crisis in 2008, liquidity was injected into the system through normal redemptions as well as through buyback of MSS-dated securities. In principle, sterilization is more effective when the excess capital flows are judged to be temporary and not "permanent." However, ex ante, it is difficult, if not impossible, to foresee the durability of the observed excess flows. The use of MSS instruments of varying maturities enables judgment of the durability of flows on an ex post basis (Mohan, Kapur 2010).

In addition to Open Market Operations, the RBI has also taken recourse to increasing the cash reserve ratio (CRR) of banks to withdraw excess liquidity from the system and moderate the expansionary impact of large capital flows on the money supply. The CRR was raised from 2004 to mid 2008 to prevent inflationary pressures and rolled back in 2008 in the event of capital outflows in the wake of global financial crisis. These operations provide the RBI with a cushion to control liquidity which can be rolled back in the case of capital reversal thereby giving back the domestic banks their own liquidity (Mohan, Kapur 2010). In addition to manipulating the CRR, the RBI has been resorting to preemptive monetary tightening through the repo and reverse repo rates to limit the effects of excess capital flows.

The sterilization operations are not without costs. The differential between the yield on Government securities and return on foreign exchange assets impose a quasi fiscal cost on the system which is shared by the Central Government in case of MSS and by the RBI in case of LAF. In case of CRR requirements the cost is borne by the Banking system.

There is a dominant economic view that against the various pecuniary and other costs incurred through sterilization must be weighed the benefits of accumulating foreign exchange reserves. These benefits can include reduced volatility in financial markets and in the exchange rate as well as an increase in overall financial stability. In the aftermath of the Balance of Payment crisis

in the 1990s, it was felt that a large buffer of foreign exchange reserves was needed if Indian economy was to be able to withstand possible future difficulties in external financing. Reddy (2002) has stressed the cost of holding reserves can be viewed as an insurance premium to maintain confidence. Although India does not have a strategy of building up reserves for self insurance¹, the reserves got built up as a consequence of intervention by RBI in the forex markets. The decline in foreign exchange reserves in 2008 indicates that substantial foreign exchange reserves helped India to tide over the crisis due to capital flow reversal, manage macroeconomic stability and cushion the effect of these disturbances on the financial systems.

By later 2000s however, India has met or exceeded the conventionally accepted thresholds for precautionary reserve holdings and thus limiting the pressures of currency appreciation associated with foreign currency inflows has gradually become the dominant objective, though it has met with limited success.

The evidence presented in this research shows that for the Indian economy net capital flows are associated with appreciation of real exchange rate. However, change in foreign exchange reserves has a negative effect on the real exchange rates. Thus the accumulation of foreign exchange reserves by the RBI has had an associated effect of restricting the real appreciation in the event of net capital flows. But the accumulation of capital flows as forex reserves even with the sterilization would not completely insulate the Indian economy from the effects of capital flows. This is consistent with an imperfect-substitutability story in which foreign creditors demand assets different from those issued by the Central bank in the course of its sterilization operations (Montiel 1998). Further it is not possible for the RBI to accumulate all the net capital flows coming into the economy. The report of the Working Group of Committee on the Global Financial System in January 2010, has also suggested that a currency cannot be permanently held below its real long –term equilibrium value. Sooner or later inflation pressures from holding down the nominal exchange rate are likely to produce the real appreciation that the authorities wanted to avoid. In recent years as foreign reserves have continuously increased (along with the

¹ Comments of Dr. D Subbarao, Governor RBI at the High level Conference on ‘The International Monetary System’ jointly organized by the Swiss National bank and the IMF in Zurich on May 11, 2010.

rising cost of holding these reserves) and inflation pressures have emerged, the RBI has to be willing to accept currency appreciation.

7.2 Inferences for Policy on Exchange Rate flexibility with intervention for Controlling Volatility

With the opening of the capital account, India has adopted a market determined exchange rate system in March 1993 whereby the exchange rate has been largely determined by demand and supply conditions in the market. This strategy has been adopted to ensure the effectiveness of the monetary policy in a regime of liberal capital account. However, within this framework the exchange rate policy follows broad principles of careful monitoring and market intervention to manage volatility. Such behavior has also been influenced by the perception of volatility in capital flows arising from monetary and financial developments in the advanced economies.

RBI participates in the market to make sales and purchase of foreign currency in order to even out lumpy demand and supply in the relatively thin forex market and to smooth jerky movements with the objective of reducing volatility, prevent the emergence of destabilizing speculative activities.

The empirical evidence presented here shows that the real exchange volatility is significantly linked to the volatility of the Net Capital flows as a whole and particularly to the volatility of the portfolio flows. There is evidence of causality from Volatility of Net Portfolio flows to Volatility of Real Exchange Rate and indications of a unidirectional causality from Volatility of Real Exchange Rate to Volatility of Net Capital Flows and causality from the Volatility of Real Exchange rate to the Volatility of Net Debt Creating flows.

The volatility of real exchange rate in the face of Volatility of short term/speculative portfolio flows needs to be seen in the context of RBI's policy intention to contain volatility rather than removing it completely in a de jure flexible exchange rate regime. In the absence of any counterfactual it would be difficult to make any inferences about the efficacy of the central bank intervention in managing exchange rate volatility and to reduce its linkage to capital flow volatility. This issue needs to be investigated further to evaluate the effectiveness of RBI interventions to control real exchange volatility in the face of volatile capital flows and devise more effective intervention strategies.

7.3 Inferences for Policy on Phased Liberalization of the Capital Account:

India has followed a policy of gradual and phased liberalization of capital flows since 1990s. The thrust of policy reform in India has been a compositional shift in capital flows in favour of non-debt creating flows as compared to debt creating flows which entails liberalization of FDI and portfolio investment flows, strict regulation of external commercial borrowings by domestic firms, especially short-term debt, discouraging the volatile element of flows from NRIs (Mohan 2008). India's policy on equity flows has been quite liberal and stable in contrast with other EMEs which liberalized equity flow and then reversed the liberalization when flows become more stable. One of the rationales for encouraging equity flows vis a vis debt flows is that the equity forms of investment serve to transfer the risk to the supplier of funds and away from the user of funds as the servicing of equity liabilities depend on the returns actually earned. On the other hand debt shifts the risk to the user as it has to be serviced irrespective of the returns earned on the foreign borrowing (CGFS, 2009). In this regard, foreign currency denominated debt compounds the problem of repayment because of the additional risk imposed on account of currency mismatches. In addition to the phased liberalization of inflows, India has taken up gradual liberalization of outflows with the objective of neutralizing the impact of net capital inflows on the conduct of domestic monetary policy. This has been done both by prepaying high-cost government external debt to the Asian Development Bank and the World Bank in February 2003 and also by removing restrictions on overseas investment by domestic entities (Mohan, 2008). As a result ceilings on foreign investment by Indian corporate entities have been progressively raised, limits on prepayment of external commercial borrowings have been increased, and limits under the Liberalized Remittance scheme have been raised.

The evidence presented here indicates that the appreciation of real exchange rates in response to increase in FDI Capital flows has not been statistically significant which goes to show that these flows are not found to have been associated with real appreciation and overheating of the Indian economy. Further the volatility of these flows has been low indicating that they have been more stable. The causality analysis indicates that the volatility of FDI is not succeeded by an increase in volatility of the real exchange rate. The literature shows that FDI flows are accompanied with transfer of technology and management skills, increased domestic capital formation to boost production in the economy. This suggests that that there is a strong case for further liberalization of these flows by removing procedural bottlenecks and improving facilitation for investment.

The evidence presented here indicates that the appreciation of real exchange rate in response to increase in Portfolio Capital flows has been statistically significant which goes to show that these flows are found to have been associated with real appreciation and overheating of the Indian economy. Further the volatility of these flows has been high indicating that they have been more unstable and volatile. Moreover, the association between Real Exchange Rate volatility and the volatility of Portfolio flows is statistically significant indicating that these flows have been found to be associated with the Volatility of the Real Exchange Rate. The causality analysis indicates that there exists causality from Volatility of Net Portfolio flows to Volatility of Real Exchange Rate. The literature shows that increased foreign investment in equity can increase domestic capital formation. But these flows have destabilizing effects due to their volatility and tendency to reverse at short notice as was observed during the global financial crisis of 2008. This suggests that that there is a strong case for further strengthening of the domestic equity markets at the same time there is a need to check the volatile elements of these inflows.

The evidence presented here indicates that the appreciation of Real Exchange Rate in response to increase in Debt Creating flows (comprising of commercial borrowings, banking capital, loans and NRI deposits etc) has been statistically significant which goes to show that these flows are found to have been associated with real appreciation and overheating of the Indian economy. Further the volatility of these flows has been high indicating that they have been more unstable and volatile. The causality analysis shows that there is a causality form real exchange rates to volatility of these flows. These flows have destabilizing effects due to their volatility and transfer of risk to the recipients compounded with currency risks if denominated in the foreign currency. Given the higher growth rate and inflation rates in India and the low yields in advanced countries the interest differential between India and the capital exporting countries there is a potential for large volumes of these flows to India if allowed unrestricted that would lead to adverse macroeconomic effects on real appreciation, monetary expansion and induce financial instability on account of their reversal in the event of higher real exchange rate volatility. This suggests that that there is a strong case for greater caution in liberalization of debt flows and even greater emphasis on restricting the volatile elements of these inflows. The policy preference should be given to local currency-denominated liabilities as compared to foreign currency denominated liabilities to avoid currency mismatches and exchange rate risks. In terms of various categories of debt creating flows, there is a merit in more stringent restrictions on the foreign borrowings by

banks (banking capital) as compared to the foreign debts of firms (external commercial borrowings). This is because, failure of nonfinancial corporate entity does not have any systemic implications but bank failures lead to adverse substantial systemic consequences for financial stability. They create and exacerbate financial instability due to lending booms and unsustainable surge in asset prices associated with capital flows (Mohan and Kapur, 2010).

The evidence presented here also indicates that the appreciation of Real Exchange Rate in response to increase in Net Capital flows has been statistically significant which goes to show that increasing capital flows are found to have been associated with real appreciation and overheating of the Indian economy. This suggests that there is a strong case for further liberalization of Capital Outflows by progressively relaxing restrictions on overseas investments by corporate entities, institutional investors and individuals. These outflows would reduce the volume of net inflows and would mitigate the adverse effects of excess capital flows over and above the absorption capacity on real exchange rate appreciation and the consequent loss of competitiveness and overheating of the Indian economy. Another advantage of the policy is that it enables the domestic residents to take advantage of the diversification opportunity outside the country. The difficulty is that this policy of liberalization of outflows if not carefully designed can actually result in even greater net inflows of speculative type encouraged by the increase in confidence in repatriating these flows.

The evidence presented further indicates that the association between the Real Exchange Rate Volatility and the Volatility of Net Capital flows is statistically significant indicating that these flows have been found to be associated with the volatility of the exchange rate with consequent adverse impact on the financial sector and the real economy. The causality analysis indicates that there is a unidirectional causality from Volatility of Real Exchange Rate to the volatility of Net Capital flows. This calls for a policy appraisal on the systems put in place for reducing the volatility of Real Exchange Rate. This calls for further research on the role of the domestic macroeconomic and financial factors on the volatility of Real Exchange Rate.

7.4 Inferences for Policy on Capital Controls:

India has been applying capital controls utilizing both quantity and price based variables to reduce the volume of flows that are perceived as volatile and destabilizing. These controls have

been mainly imposed on the debt side of the flows². Some of the controls on debt flows include a ceiling on the extent of FII investment in sovereign and corporate debt instruments which is in the form of a quantitative control and withholding tax which is a price variable. External Commercial borrowing by Indian firms that are channeled through both the automatic and the approval routes are subject to interest rate ceiling and those under automatic route are subject to quantitative restrictions as well. Flow of Non-Resident Indians (NRI) deposits is controlled through an interest rate ceiling, a price variable. The adoption of Capital controls is a precautionary measure to reduce the destabilizing effects associated with the short term/volatile inflows which could otherwise lead to real appreciation of the exchange rate and monetary expansion during inflow and traumatic financial distress during outflows. Controls on Capital inflow have the potential to help monetary policy at least in the short run by moderating the size or the volatility of the capital flows and modify their composition in favour of more stable flows.

In view of the evidence presented here of the significant association between Real Exchange Rate Volatility with the Volatility of the Net Capital Flows on one hand and the Volatility of the Portfolio Flows on the other, and the significant causality from Portfolio Flows Volatility to Real Exchange Rate Volatility, there is a strong case for India to limit the inflow of volatile short term capital flows through further use of market based capital controls such as tax on some classes of foreign exchange transactions. As seen in the literature, in recent years several emerging market economies have used variants of tax on certain foreign exchange transactions referred to as Tobin Tax to discourage heavy, short term capital flows with varying degree of success in reducing exchange rate volatility and in reducing the distress in the event of capital reversal as observed in the global financial crisis of 2008. Further, as described in the literature, capital controls, despite the potential distortions, can have several benefits too in terms of altering the composition of flows in favour of long duration flows thus controlling the entry of short term flows which are volatile and destabilizing in nature.

7.5 Inferences for Policy on Banking Regulation

In the face of Balance of Payment crisis in the early 1990s and the global financial crisis in 2008 the Banking system in India has largely escaped unscathed. The low vulnerability of the financial

² Comments of Dr. D Subbarao, Governor RBI at the High level Conference on ‘The International Monetary System’ jointly organized by the Swiss National bank and the IMF in Zurich on May 11, 2010.

sector can be attributed to a large extent to the strengthening of the Banking Regulation and supervision in India. This use of prudential measures is an important approach to maintain the soundness of the financial sector during capital inflows, in addition to or supplementary to the more conventional use of sterilization instruments and capital controls. Such regulations have helped to check the credit booms in sectors witnessing high growth possibly fueled by the availability of abundant liquidity arising from excess capital flows (Mohan, Kapur 2010). During the period of strong credit growth (2005-2007) India tightened prudential norms, -- risk weights and provisioning norms- in regard to certain sectors such as real estate and stock markets in which relatively high credit growth was being witnessed. Similarly, risk weights for capital adequacy purposes were raised for sectors such as commercial real estate, residential housing loans, consumer credit, and capital market exposures during 2005-2007. The prudential norms were rolled back in late 2008 in the aftermath of the global financial crisis. India has taken up strengthening of regulatory regime in nonbanking financial companies so as to avoid regulatory arbitrage. Capital adequacy ratio in the Banking sector have been comparable to the international norms, corporate balance sheets are also reported to be robust. Ratio of loans to deposits is less than one indicating that the domestic deposits are sufficient to fund the banking system loans and problems in global financial markets should not have any direct impact on domestic lending. These features have provided a certain degree of resilience to the banking system in the face of large and volatile capital flows.

The empirical evidence presented here indicates causality from Real Exchange Rate Volatility to Volatility of Debt Creating Flows. These flows have destabilizing effects due to their volatility and transfer of risk to the recipients compounded with currency risks if denominated in the foreign currency. In view of the implications of the bank lending behaviors on financial stability there is a need for further strengthening of the banking regulations to control their lending standards in the face of increase in banking capital flows and increasing volatility in the event of change in macroeconomic conditions. The failure in a particular bank in the event of a foreign capital reversal can lead to loss of confidence and trust in other banks which may jeopardize money and credit markets and a distressing effect on the real economic activity as has been witnessed in many emerging market countries in the event of global financial crisis in 2008. A policy of liberalizing banks' access to foreign capital has to be accompanied with capital controls

to check volatility and also sound banking regulations on lending to avoid lending booms and unsustainable surge in asset prices associated with capital flows.

7.6 Inferences for Fiscal Policy

In the recent years, fiscal policy has not played an active major role in managing inflows in India other than the provision of the financial stimulus at the time of global financial crisis of 2008 and its gradual withdrawal thereafter in the face of resumption of capital flows to finance the current account deficit. An attempt has been made to cut expenditure, reduce government deficit and debt through the adoption of the Fiscal Responsibility and Budget Management Act in 2003. The Thirteenth Finance Commission has advocated countercyclical fiscal policy by setting paths for debt reduction. These measure aim at controlling inflationary pressures which can be linked to real appreciation and the loss of competitiveness.

The empirical evidence presented here indicates that association between real exchange rate appreciation and India government consumption expenditure is not statistically significant. This leads to inference that (i) a large share of government consumption expenditure falls on tradables such as oil import, fertilizer import etc which does not create a pressure on the prices of the nontradables which could otherwise cause real appreciation in a significant way. (ii) The dissaving by government in the event of high expenditure has been compensated by high Indian private savings as reflected in modest current account deficits & (iii) Rising government expenditure has been associated with a high growth rate as a result of which the monetary expansion caused by the rising trend of government consumption expenditure has been accommodated by the rising need for money balances in a fast growing economy.

In Indian context there are limitations to tightening of fiscal stance because of committed nature of government expenditure but there is scope for cutting wasteful government expenditure to reduce the inflationary impact of the capital flows. A cut in government expenditure will assist the monetary policy in limiting the appreciation of real exchange rate. Another way fiscal policy can assist in reducing real exchange rate in the face of rising capital inflows is through public investment in infrastructure creation and human capital development (to be financed through broadening of tax base to the extent possible). This would improve the production capacity in the economy and remove the supply constraints that often lead to inflationary pressure due to rise in aggregated demand in the face of capital inflows.

7.7 Conclusions

The main contribution of this research lies in comprehensively analyzing the relationship between the net capital flows, and all its components and the real exchange rate in India consequent to the liberalization of the capital account. Further, other fundamental determinants of real exchange rate like terms of trade, trade openness, productivity differential as suggested in the literature along with monetary and fiscal variables have been included in the analysis. In addition, this study for the first time in the context of India attempts a detailed investigation into the linkage between volatility of the capital flows and that of its components with the volatility of the real exchange rate and the direction of causality between them. An effort has been made to draw inferences from the results for policy making to mitigate the adverse consequences of capital flows on the Indian economy.

The estimations in this research are conducted on the quarterly data on Indian economy from 1996-97 to 2012-13. The Autoregressive Distributed Lag (ARDL) approach to cointegration is used to examine the relationship between capital flow, its various components and other macroeconomic fundamentals and the real exchange rate. In addition, Unrestricted Vector Autoregressive (VAR) Models are used to study the dynamic relation between the real exchange rate and its determinants. Further the volatility linkage between the capital flow, its various components and the real exchange rate are investigated using cointegration analysis by Johansen (1991, 1995) method and causality relationship using Granger causality on ARCH based, GARCH based and four period moving standard deviation based volatility measures.

The most significant finding of the research is that net capital flows in India are positively associated with the real exchange rate appreciation and the association is statistically significant. Amongst the components of net capital flow, Foreign Direct Investment flows are not found to be significantly associated with the real appreciation but portfolio flows are found to be significantly associated with real appreciation. The change in foreign exchange reserves is found to be negatively associated with real exchange rate. Government consumption expenditure is not found to be significantly associated with real appreciation thereby limiting the role of fiscal policy in managing capital flows. This evidence suggests that the increasing volume and volatility of cross border flows in India have adverse consequence such as loss of competitiveness of the export sectors, inflationary pressures leading to lowering of profitability of producers, widening of trade deficit and shock to the real economy.

As is the case with many emerging market economies, challenges posed by the capital flows have elicited multiple policy responses from the Indian Government and the monetary authority (Reserve Bank of India). These include foreign exchange market intervention and subsequent sterilization, greater flexibility of exchange rates, phased liberalization of the policy regime for current and capital account outflows, (capital controls) prudential norms etc.

The empirical evidence on the negative association between change in foreign exchange reserves and real exchange rate shows that the accumulation of foreign exchange reserves by RBI has prevented the appreciation of the real exchange rate in the face of increase in net capital flows and thereby mitigated its adverse consequences but this does not seem to completely insulate the Indian economy from the effects of capital flows. Further, it is not possible for the RBI to accumulate all the net capital flows coming into the economy. This leads to the inference that a currency cannot be permanently held below its real long-term equilibrium value. Sooner or later inflation pressures from holding down the nominal exchange rate are like to produce the real appreciation that the authorities wanted to avoid. Further, the sterilization operations to limit the monetary expansion due to reserve accumulation are not without costs. There is a dominant economic view that against the various pecuniary and other costs incurred through sterilization must be weighed the benefits of accumulating foreign exchange reserves. These benefits can include reduced volatility in financial markets and in the exchange rate as well as an increase in overall financial stability. The decline in foreign exchange reserves in 2008 indicates that substantial foreign exchange reserves helped India to tide over the crisis due to capital flow reversal, manage macroeconomic stability and cushion the effect of these disturbances on the financial systems. In recent years India has accumulated substantial foreign reserves as a result of market intervention by RBI. As the cost of holding these foreign reserves have continuously increased and inflation pressures have emerged, the RBI has to become more willing to accept currency appreciation.

The empirical evidence presented here shows that the Real Exchange Rate volatility is significantly linked to the volatility of the Net Capital flows. Further there is evidence of causality from volatility of Real Exchange Rate to volatility of Net Capital flows. This issue calls for research on the role of domestic macroeconomic and financial factors in causing the volatility of real exchange rate which in turn is associated with the volatility of the net capital flows.

The evidence presented here indicates that the appreciation of real exchange rate in response to increase in FDI flows has not been statistically significant which goes to show that these flows are not found to have been associated with real appreciation and overheating of the Indian economy. Further the volatility of these flows has been low indicating they have been more stable. The causality analysis indicates that the volatility of FDI is not associated with an increase in volatility of the real exchange. The literature shows that FDI are accompanied with transfer of technology and management skills, increased domestic capital formation to boost production in the economy. This suggests that that there is a strong case for further liberalization of these flows by removing procedural bottlenecks and improving facilitation for investment.

The evidence presented here indicates that the appreciation of real exchange rate in response to increase in Portfolio Capital flows has been statistically significant which goes to show that these flows are found to have been associated with real appreciation and overheating of the Indian economy. Further the volatility of these flows has been high indicating they have been more unstable and volatile. The causality analysis indicates that there exists causality from volatility of Net Portfolio flows to volatility of Real Exchange Rate. The literature shows that increased foreign investment in equity can increase domestic capital formation. But these flows have destabilizing effects due to their volatility and tendency to reverse at short notice as was observed during the global financial crisis of 2008. This suggests that that there is a strong case for further strengthening of the domestic equity markets at the same time there is a need to check the volatile elements of these inflows. Further there is need to evaluate the effectiveness of RBI interventions in forex market to control real exchange volatility in the face of volatile portfolio flows and devise more effective intervention strategies.

The evidence presented here indicates that the appreciation of real exchange rates in response to increase in Debt Creating flows (comprising of commercial borrowings, banking capital, loans and NRI deposits etc) has been statistically significant which goes to show that these flows are found to have been associated with real appreciation and overheating of the Indian economy. The causality analysis shows that there is a causality form real exchange rate to volatility of these flows. These flows have destabilizing effects due to their volatility and transfer of risk to the recipients compounded with currency risks if denominated in the foreign currency. Given the higher growth rate and inflation rates in India, the low yields in advanced countries and the interest differential between India and the capital exporting countries there is a potential for large

volumes of these flows to India if allowed unrestricted. This would lead to adverse macroeconomic effects on real appreciation, monetary expansion and induce financial instability on account of their reversal in the event of higher real exchange rate volatility. There is a strong case for greater caution in liberalization of debt flows with more stringent restrictions on the foreign borrowings by banks (banking capital) as compared to the foreign debts of firms (external commercial borrowings) and even greater emphasis on restricting the volatile elements of these inflows.

Further, there is a strong case for further liberalization of Capital Outflows by progressively relaxing restrictions on overseas investments by corporate entities, institutional investors and individuals. These outflows would reduce the volume of net inflows and would mitigate the adverse effects of excess capital flows over and above the absorption capacity on real exchange rates appreciation and the consequent loss of competitiveness and overheating of the Indian economy. Another advantage of the policy is that it enables the domestic residents to take advantage of the diversification opportunity outside the country. The difficulty is that this policy of liberalization of outflows if not carefully designed can actually result in even greater net inflows of speculative type encouraged by the increase in confidence in repatriating these flows.

India has been applying capital controls utilizing both quantity and price based variables to reduce the volume of flows that is perceived as volatile and destabilizing. It appears that in the course of liberalization of capital flows to India the policy makers have used policy levers on the debt side of the flows but no effective checks have been put on the flows based on their duration i.e. short-term versus long term flows. In view of the significant association between the real exchange rate volatility and the volatility of the net capital flows there is a strong case for India to limit the inflow of volatile short term capital flows through further use of market based capital controls such as tax on some classes of foreign exchange transactions. In recent years several emerging market economies have used variants of tax on certain foreign exchange transactions referred to as Tobin tax to discourage heavy, short term capital flows with varying degree of success in reducing exchange rate volatility and in reducing the distress in the event of capital reversal as in the global financial crisis of 2008.

In view of the implications of the bank lending behaviors on financial stability there is a need for further strengthening of the banking regulations to control their lending standards in the face of

increase in banking capital flows. A policy of liberalizing banks' access to foreign capital has to be accompanied with capital controls to check volatility and also sound banking regulations on lending.

In the Indian context there are limitations to tightening of fiscal stance because of committed nature of political economy government expenditure but there is scope for cutting wasteful government expenditure to reduce the inflationary impact of the capital flows. A cut in government expenditure will assist the monetary policy in limiting the appreciation of real exchange rate. Another way fiscal policy can assist in reducing real exchange rate in the face of rising capital inflows is through public investment in infrastructure creation and human capital development (to be financed through broadening of tax base to the extent possible). This would improve the production capacity in the economy and remove the supply constraints that often lead to inflationary pressure due to rise in aggregated demand in the face of capital inflows.