

## Chapter 1: Introduction

India has witnessed a large trend increase in cross border flows since the introduction of the economic reforms process in the external sector in early 1990s consequent to the Balance of Payment (BoP) crisis. Net capital flows to India increased from \$ 7.1 billion in 1990-91 to \$ 8.85 billion in 2000-01 and further to \$ 89.30 billion during 2012-13. Underlying this growing trend in the volume of net capital flows has been an even more prominent growth in gross inflows and outflows. Gross volume of capital inflows amounted to \$ 22.77 billion in 1990-91 and \$471.70 billion in 2011-12 against an outflow of US \$ 15.71 billion and US \$ 382.40 billion respectively. Expressed in percentage of GDP, the net capital flow increased from 2.2% of GDP in 1990-91 to around 3.63 % in 2010-11 and further to 4.84 % in 2012-13. The increase in net capital flows comprises of a significant increase in its components which are Foreign Direct Investment Flows (FDI), Portfolio Flows and Debt Creating Flows in the form of Banking Capital, External Commercial Borrowings of corporate entities and Non-resident Indian Deposits. The upswing in the capital mobility to India and other emerging markets suffered a brief setback in the global financial crisis in 2008. But after ebbing of the crisis, capital flows to emerging market economies rebounded in late 2009 and 2010.

A significant feature of capital flows in India is the growing trend of capital outflows facilitated by relaxation of the ceilings on capital outflow to facilitate direct overseas investment by Indian companies through joint ventures and wholly owned subsidiaries, financial support to exports especially project exports and easing of the limits on outbound investment by individuals. Outbound FDI flows from India jumped from US \$ 0.76 billion in 2000-01 to US \$ 16.52 billion in 2010-11 though it has witnessed a down trend recently.

The surge of capital inflows that India experienced after the liberalization in early 1990s can be attributed to a variety of push and pull factors. While the relatively high interest rate differentials between India and rest of the world have played an important role in pushing foreign capital after the opening of financial markets in 1990s, at the same time internal pull factors such as the significant institutional, regulatory and policy changes following the balance of payment crisis in 1991 such as switch to flexible exchange rate regime, full current account convertibility,

dismantling of trade restrictions, consolidation of external debt, liberalization of investment policies relating to FDI, Portfolio flows etc. have been equally important in attracting these flows to India. Domestic macroeconomic conditions and institutional framework factors such as strong macroeconomic fundamentals, a resilient financial sector, sophistication of the domestic equity market, the improved performance of the corporate sector, investment opportunities and attractive valuations also provided confidence to the foreign investors.

Another important feature of the capital flows to India has been their increasing volatility over time as is the case with flows to other emerging market economies. Capital inflows, especially short term capital flows, maybe reversed at a short notice, possibly leading to a financial crisis. Almost all the studies on currency crisis identified the presence of short term capital, what is called as “hot money” variety, which are volatile in nature, as the main factor responsible for increase in financial fragility and eventually economic crisis in the East Asian and Latin American countries in the late 1990s. The volatility of capital flows is often a symptom of underlying global factors. Financial or monetary shocks in investor countries, sharp changes in expectations, contagion etc. over which the recipient country has little control, are known to destabilize capital movements in these economies. Domestic factors such as macroeconomic conditions, loss of investor confidence and lack of developed financial systems are also known to contribute to volatility of the capital flows. The rise in volatility of capital flows has been more prominent in India in the recent years since 2003-04 with the net capital flows jumping to a level of 9% of GDP in 2007-08 and then slumping to a level of 0.8 % of GDP in the very next year 2008-09 in the backdrop of the global financial crises.

From a theoretical perspective, under assumptions of perfect markets and full information, liberalization of capital flows can benefit both the source and recipient countries by leading to a more efficient allocation of resources between these two countries (IMF, 2012). Cross-border movement of capital from a country with lower rate of return to a country with higher rate of return benefits investors in the source countries, besides giving them an opportunity for cross-border risk mitigation through international diversification of their investments. The resulting global allocation of resources, in turn facilitates an increase in investment in the capital scarce recipient countries with an associated transfer of technology thereby stimulating economic growth and improving the standard of living of in these countries. Capital flows contribute to financing current account deficits and increase welfare by enabling households in consumption

smoothing over time. In addition, liberalization of capital flows can benefit the recipient emerging market countries through accelerated development of domestic financial systems due to greater competition and policy discipline.

However, doubts have been raised on the potential gains from the unfettered opening up of the capital account. Large capital flows, over and above the financing needs of the recipient country, may lead to excessive expansion of aggregate demand and can be associated with negative effects on the financial sector. Standard open economy models, such as the intertemporal model of consumption and investment in an open economy with capital mobility (in the tradition of Irving Fisher), suggest that a surge in capital inflows is likely to be associated with appreciation of real exchange rate, accumulation of foreign exchange reserves, rapid growth in money supply, inflationary pressures, widening of current account deficits involving both an increase in national investment and a fall in national saving, rise in private consumption driven by rising imports of goods, etc (Mejia, 1999). The volatility of capital flows and the potential economic instability associated with it further adds to the woes of the target country.

The concept of real exchange rate has been most widely used to analyze the impact of capital flows on the economies of the developing countries. The real exchange rate is an important measure of the competitiveness of an economy as it is associated with export growth. The impact of the capital inflows on the domestic economy which is mainly captured through the appreciation of Real Exchange Rate is referred to as the “the transfer problem”.

The volatility of capital flows is often associated with high real exchange rate volatility in the emerging country that in turn translates into unpredictable movements in the relative prices in the economy, adversely affecting investment and the consequent economic growth. These adverse consequences are amplified in countries with relatively low level of financial development. The negative impact of the real exchange rate volatility on growth can be transmitted through declining investment and by lower foreign trade -- particularly in the differentiated products.

The increase in magnitude and volatility of capital flows to emerging market economies have stimulated keen interest and research on understanding the effects of these flows on the recipient countries as well as on the policy response adopted by them to safeguard against the macroeconomic instability that appears to be associated with international capital mobility. These issues are of significant importance for India as it has progressively opened up the capital

account since the initiation of reforms in early 1990s and is gradually advancing on to the path of full capital account convertibility.

The behavior of real exchange rate in response to capital inflows and its components has been examined in several empirical studies. A review of the empirical literature shows that the results vary for different groups and individual countries largely conditioned by the magnitude of the capital flows received by the countries and the macroeconomic policy responses and institutional framework put in place by them to manage the capital flows. In the financial account of balance of payments four distinctive types of capital flows usually appear, namely Foreign Direct Investment (FDI), Portfolio investments, Debt Creating Flows and Other Capital. Empirical studies indicate that their impact on the real exchange rate would be different depending on whether they are used to finance purchase of non-tradables, or tradables or are used to finance exports production. The literature on the empirical studies capturing the effect of volatility of capital flows on real exchange rate volatility is limited and inconclusive.

The main objectives of this research are to analyze the relationship between capital flows and its components to India and the real exchange rate; to investigate the linkage between the real exchange rate volatility in India and the volatility of capital flows and that of its components and the direction of causality and based on results of the analysis to draw inferences for policies for effective management of the capital account in India.

Two Models with log-linear specifications are employed to estimate the relation between the dependant variable i.e. real effective exchange rate and the net capital flows and its components along with other explanatory variables. In the first model net capital flows, government consumption expenditure, trade openness, terms of trade, proxy for productivity differential, current account balance, and change in foreign exchange reserves are used as explanatory variables and real effective exchange rate index as dependent variable. The second model uses the disaggregated components of net capital flows i.e. FDI, portfolio flows, debt creating flows and other capital flows in place of net capital flows along with other explanatory variables and the real effective exchange rate index as dependent variable in order to analyze the impact of each of these types of components of capital flows on the real exchange rate and the related adverse effects.

The estimations in this research are conducted on the quarterly data on Indian economy from 1996-1997 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. This estimation procedure has the advantage that it allows for a mixture of explanatory variables which are integrated of different order and that they provide consistent estimates for small samples. In addition Unrestricted Vector Autoregressive (VAR) Models are used to study the dynamic relationship between the real exchange rate and its determinants. VAR based cointegration tests using the methodology developed by Johansen (1991, 1995) and Granger Causality Tests are employed to test the linkage between ARCH based, GARCH based, and moving standard deviation based measures of volatility of real exchange rates and net capital flows and its components.

The most significant findings of the research are that net capital flows in India have been found to have been associated with the real exchange rate appreciation and the association is statistically significant. Amongst the components of net capital flows, foreign direct investment flows are not found to be significantly associated with the real appreciation but portfolio flows and debt creating flows are found to be associated with real appreciation. Government consumption expenditure is not found to be significantly associated with real appreciation thereby limiting the role of fiscal policy in managing capital flows.

There is evidence to indicate a co movement between the volatility of real exchange rate and volatility of net capital flows as reflected by the cointegration relationship between the four period moving standard deviation based volatility measures. A unidirectional causality from volatility of real exchange rate to volatility of net capital flows is found to exist. No causality relation is found to exist between volatility of Net Foreign Direct Investment flows and volatility of real exchange rate in either direction. However, there is evidence of causality from volatility of Net Portfolio flows to volatility of real exchange rate. Further, causality from the volatility of real exchange rate to the volatility of Net Debt Creating flows is found to exist while the reverse is not found to exist.

In the light of the empirical evidence presented here, the study draws inferences for policies for effective management of capital account in India and makes a strong case for a more accommodative policy on real exchange rate appreciation, encouragement to FDI flows, capital

controls to restrict short term flows, further liberalization of capital outflows, stringent restrictions on foreign borrowings by banks, further strengthening of the banking regulations to control their lending standards, a cut in government expenditure and focus on public investment in infrastructure creation and human capital development (to be financed through broadening of tax base to the extent possible) to remove the supply constraints.

While most studies analyze the effect of aggregated capital flows or one particular type of capital flow on real exchange rate, the main contribution of this research lies in comprehensively analyzing the relationship between the net capital flows, and all its components on 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 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 rest of the thesis is organized as follows. Chapter 2 traces the process of evolution of openness of capital account in India and the trends of capital flows their magnitude and composition since the onset of liberalization. Chapter 3 attempts a comprehensive review of the theoretical and empirical literature on the impact of capital flows and their volatility on the domestic economy. Chapter 4 spells out the Research Objective, the Scope, Methodology and the datasets for this research. Chapter 5 presents the results of the econometric analysis of the relation between real exchange rates and its determinants and the dynamic response analysis of real exchange rate to shocks in capital flows and other determinants and interprets them. Chapter 6 analyzes the results of the investigation into the linkage between volatility of real exchange rate and the capital flows. Chapter 7 dwells on the policy inferences and draws conclusions.