Chapter 1

Introduction

The concept of exchange rate regime has always been at the forefront of economic policy making and formulating economic development and growth strategies of any country. In the recent years, it has become all the more important in view of ongoing global imbalances. The channel through which the exchange rate regime might influence growth is trade, investment and productivity. Although there has been no conclusive evidence on exchange rate regime and its impact on growth, but the flexible exchange rate regimes provide more headroom for the conduct of monetary policy. Prof Robert Mundell showed that in a system of floating exchange rates, fiscal policy becomes blunt and monetary policy assumes importance as a tool of macroeconomic management. Under such an arrangement, the Central Banks should have autonomy to regulate interest rates and ensure unrestricted capital mobility. In contrast, a fixed exchange rate regime renders the monetary policy ineffectual and the fiscal policy becomes the instrument of policy.

Exchange rate regime may be explained as the arrangement or strategy that is used by the governments in order to administer their respective currencies in the context of the other major currencies of the world. There are some basic exchange rate regimes that are used worldwide can be broadly classified as the floating exchange rate, the pegged float exchange rate and the fixed or pegged exchange rate. However, in narrower sense, there are varieties of exchange rate regimes that can prevail across countries. It is important to note that the prevailing exchange rate regimes may differ from their officially announced exchange rate regimes. Thus, IMF provides a de facto classification of various exchange rate regimes prevailing across countries. The scheme ranks exchange rate arrangements on the basis of their degree of flexibility and the existence of formal or informal commitments to exchange rate paths. It distinguishes among different forms
of exchange rate regimes, in addition to arrangements with no separate legal tender, to help assess the implications of the choice of exchange rate arrangement for the degree of monetary policy independence. The system presents members' exchange rate regimes and monetary policy frameworks to provide greater transparency in the classification scheme and to illustrate the relationship between exchange rate regimes and different monetary policy frameworks. The various exchange rate regimes as classified by the IMF are discussed as follows.

(i) Exchange arrangements with no separate legal tender: The currency of another country circulates as the sole legal tender (formal dollarization), or the member belongs to a monetary or currency union in which the same legal tender is shared by the members of the union. Adopting such regimes implies the complete surrender of the monetary authorities' control over domestic monetary policy.

(ii) Currency board arrangements: A monetary regime based on an explicit legislative commitment to exchange domestic currency for a specified foreign currency at a fixed exchange rate, combined with restrictions on the issuing authority to ensure the fulfillment of its legal obligation. This implies that domestic currency will be issued only against foreign exchange and that it remains fully backed by foreign assets, leaving little scope for discretionary monetary policy and eliminating traditional central bank functions, such as monetary control and lender-of-last-resort. Some flexibility may still be afforded, depending on how strict the banking rules of the currency board arrangement are. As on July 31, 2006, there were seven countries having such arrangement which were Bosnia and Herzegovina, Brunei Darussalam, Bulgaria, Hong Kong SAR, Djibouti, Estonia and Lithuania.

(iii) Conventional fixed peg arrangements: The country pegs its currency within margins of ±1 percent or less vis-à-vis another
currency; a cooperative arrangement, such as the ERM II; or a basket of currencies, where the basket is formed from the currencies of major trading or financial partners and weights reflect the geographical distribution of trade, services, or capital flows. The currency composites can also be standardized, as in the case of the SDR. There is no commitment to keep the parity irrevocably. The exchange rate may fluctuate within narrow margins of less than ±1 percent around a central rate, or the maximum and minimum value of the exchange rate may remain within a narrow margin of 2 percent—for at least three months. The monetary authority maintains the fixed parity through direct intervention (i.e., via sale/purchase of foreign exchange in the market) or indirect intervention (e.g., via the use of interest rate policy, imposition of foreign exchange regulations, exercise of moral suasion that constrains foreign exchange activity, or through intervention by other public institutions). Flexibility of monetary policy, though limited, is greater than in the case of exchange arrangements with no separate legal tender and currency boards because traditional central banking functions are still possible, and the monetary authority can adjust the level of the exchange rate, although relatively infrequently.

(iv) Pegged exchange rates within horizontal bands: The value of the currency is maintained within certain margins of fluctuation of more than ±1 percent around a fixed central rate or the margin between the maximum and minimum value of the exchange rate exceeds 2 percent. As in the case of conventional fixed pegs, reference may be made to a single currency, a cooperative arrangement, or a currency composite. There is a limited degree of monetary policy discretion, depending on the band width. These countries include Hungary and Tonga.

(v) Crawling pegs: The currency is adjusted periodically in small amounts at a fixed rate or in response to changes in selective quantitative indicators, such as past inflation differentials vis-à-vis...
vis major trading partners, differentials between the inflation target and expected inflation in major trading partners. The rate of crawl can be set to adjust for measured inflation or other indicators (backward looking), or set at a preannounced fixed rate and/or below the projected inflation differentials (forward looking). Maintaining a crawling peg imposes constraints on monetary policy in a manner similar to a fixed peg system. Countries falling under this category of exchange rate regime included Azerbaijan, Botswana, Costa Rica, Iran and Nicaragua.

(vi) Exchange rates within crawling bands: The currency is maintained within certain fluctuation margins of at least ±1 percent around a central rate, or the margin between the maximum and minimum value of the exchange rate exceeds 2 percent, and the central rate or margins are adjusted periodically at a fixed rate or in response to changes in selective quantitative indicators. The degree of exchange rate flexibility is a function of the band width. Bands are either symmetric around a crawling central parity or widen gradually with an asymmetric choice of the crawl of upper and lower bands (in the latter case, there may be no preannounced central rate). The commitment to maintain the exchange rate within the band imposes constraints on monetary policy, with the degree of policy independence being a function of the band width.

(vii) Managed floating with no predetermined path for the exchange rate: The monetary authority attempts to influence the exchange rate without having a specific exchange rate path or target. Indicators for managing the rate are broadly judgmental (e.g., balance of payments position, international reserves, parallel market developments), and adjustments may not be automatic. Intervention may be direct or indirect. As on July 31, 2006, there were 51 countries with managed float without predetermined path for exchange rate. These included Argentina, Bangladesh, Cambodia, Gambia, Ghana, Haiti,
Jamaica, Lao P.D.R., Madagascar, Malawi, Mauritius, Moldova, Mongolia, Sri Lanka, India, Thailand, Kenya, Sudan, Russian federation, Myanmar, etc.

(viii) Independently floating: The exchange rate is market-determined, with any official foreign exchange market intervention aimed at moderating the rate of change and preventing undue fluctuations in the exchange rate, rather than at establishing a level for it. There were 25 countries which allowed their nominal exchange rate to float freely. Countries, viz., Australia, Brazil, Canada, Chile, Iceland, Israel, Korea, Mexico, New Zealand, Norway, Philippines, Poland, South Africa, Sweden, Turkey, Japan, Switzerland, United Kingdom and United States are considered to be having an independent floating exchange rate system.

In India exchange rate regime has undergone many shifts since the institution of Bretton Wood System. During Bretton Wood era exchange rate of rupee was fixed to gold and dollar. But in the post-Bretton Woods period, the rupee was effectively pegged to a basket of currencies of India’s major trading partners from September 1975. This system continued through the 1980s and exchange rate was allowed to fluctuate in a wider margin and to depreciate modestly with a view to maintain competitiveness. Nevertheless, exchange rate was adjusted in the light of the balance of payments crisis in 1991. As a part of the overall macroeconomic stabilization programme, the exchange rate of the rupee was devalued in two stages by 18 per cent in terms of US dollar in July 1991. Subsequently, transition to market determined exchanger ate system took place in two states and the sequencing was based on the report of the High Level Committee on Balance of Payments, 1993.

The Liberalised Exchange Rate Management System (LERMS) was instituted in March 1991 and under this system a dual exchange rate arrangement under which 40 per cent of the current receipts were required
to be surrendered to the Reserve Bank at the official exchange rate while the rest 60 per cent could be converted at the market rate. The 40 per cent portion surrendered at the official rate was for meeting the essential imports at a lower cost. Exchange rate regime was under transition phase during March 1992 to March 1993.

Finally, the fixed exchange rate regime came to an end and the unified market determined exchange rate regime came into place replacing the dual exchange rate regime on March 1, 1993. Since then the objective of the exchange rate management policy has been to ensure that the external value of the rupee is realistic and credible as evidenced by a sustainable current account deficit and manageable foreign exchange situation. Subject to this predominant objective, the exchange rate policy is guided by the need to reduce excess volatility, prevent the emergence of destabilizing speculative activities, help maintain adequate level of reserves and develop an orderly foreign exchange market (Jalan, 1999). The experience with the market determined exchange rate regime has been satisfactory along with exchange rate management contending with a few episodes of volatility occasionally.

A great deal of interest in real exchange rate stability emerged after the collapse of the Bretton Wood System. Since many countries have switched to flexible exchange rates, which are associated with high variability of real exchange rates, real exchange rates became central focus of theoretical and empirical research. Low variability in real exchange rate is desirable as it affects economic stability, development and growth. Economic theory typically predicts that the behaviour of the real exchange rate should be closely related to the behaviour of deviations from purchasing power parity (PPP). According to the PPP theory, nominal exchange rates adjust to offset changes in relative prices. If this is correct, then the real exchange rate will be stationary and fluctuate around the mean in the long run. However, there seems to be a widespread agreement that substantial deviations from PPP have occurred since the abandonment of the Bretton Woods fixed exchange rate system. In particular, recent empirical evidence
for this period has shown that the real exchange rate is not only very volatile in the short run, the speed of convergence to PPP in the long run is extremely slow, (see e.g. Rogoff (1996) or Froot and Rogoff (1995) for a survey).

1.1 Rational of the Study

Even as the quest for an appropriate exchange regime goes on the world over, a slender consensus has emerged around the impossibility of unholy trinity-freely floating exchange rates, independent monetary policy and open capital account. There is also a broader convergence of views around the proposition that the choice of the appropriate exchange rate regime depends critically upon historical factors, the macroeconomic and structural characteristics of the economy, the degree of its openness to both current and capital flows, the monetary policy stance and the credibility assigned to the exchange rate authority by markets. But whatever may be the exchange rate regime real exchange rate is the key to exchange rate management of any country. Real exchange rate (RER) is the key not only to exchanger rate management but also to country’s external sector management (balance of payments) and conduct of monetary policy. Real exchange rate stability is crucial to developing countries since it affects trade, capital inflows, and monetary policy response function in an open economy.

Intuitively, the basic idea behind tracking RER is that any country cannot afford to remain isolated in terms of movement in major cross currency exchange rates as well as inflation differential over a long period of time. At some point of time, a country has to adjust its exchange rate (in case of fixed exchange rate) or the exchange rate adjusts itself (in case of flexible exchange rate) to the basic fundamentals of the domestic economy vis-à-vis major trading partners like inflation differential and the movement in the other exchange rates. For instance, the South East Asian currencies, which remained stable over a long period, could not isolate themselves from
the surge of US dollar against Japanese yen (40 per cent during April 1995 to July 1997). The sharp surge in US dollar against the Yen had the impact of appreciation in the RER of most of these countries which combined with slowdown in exports across the region (which could be the result of overvaluation of these currencies as well) provided the spark for adjustment in these currencies. Therefore, in the long run, in order to see that the exchange rate is moving in tandem with the inflation differential and cross currency exchange rates, one cannot ignore tracking RER.

In the light of importance gained by RER over the years to track the external competitiveness of an economy and its impact on macroeconomic variables, it would be quite rationale and interesting to undertake a study on various aspects of RER from the policy perspective.

1.2 Objectives

In the present study on “Determinants and Impact of Real Exchange Rate in India on Trade, Capital Inflows and Conduct of Monetary Policy”, we intend to undertake an evaluation of real exchange rate in India. Specifically, we would make an attempt to evaluate the dynamics of the real exchange rate and its explanatory variables in the light of the specific characteristics of the Indian economy. The present work estimates the determinants of the RER in India and find out whether actual RER deviates from the equilibrium RER (fitted by the determinants) over the period. The speed of convergence of RER towards its long-run equilibrium level would also be estimated.

RER also affects the trade balance of a country through varying impact on exports and imports. RER appreciation discourages exports emanating from a country through increasing their prices in international markets, while it encourages imports making them cheap in domestic market. The net impact on trade balance, however, depends on the exchange rate elasticity of exports and imports. The Marshall-Lerner (ML) condition provides that RER depreciation would improve the trade balance of a
country provided the sum of exchange rate elasticity of exports and imports is more than unit. Therefore, an attempt would be made to empirically examine the impact of RER on trade balance of India, which basically tantamount to checking the validity of ML condition. RER also influence the capital inflows in an economy largely through affecting trade balance. The appreciation in RER generally would lead to deteriorating trade balance and current account deficit and to finance this deficit more capital flows would be needed, as per Monetary-Balance-of-Payments-Model. These capital flows would result in further appreciation on RER and next time higher capital flows would be needed to finance the expanded current account deficit. There are other channels also through which RER affects the capital flows. Against the above background, the impact of RER on trade and capital flows in India would also be estimated.

The monetary policy in developing and emerging market economies has to deal with multiple objectives such as price stability, growth, financial stability etc. RER movements having implication for these objectives influence the monetary policy reaction function and hence, it can be included in the monetary policy reaction function. A number of empirical studies have established the role of RER in monetary policy reaction function across the countries. As per the extant literature, RER appreciation would trigger the short-term interest rate downward, while depreciation would push the short-term interest rate upward in an open economy framework. With increasing openness of the Indian economy over the last two decades, it appears that RER movements have become increasingly important for the monetary policy. Hence, an attempt has been made to estimate the relevance of the RER in the India’s monetary policy reaction function along with other controlling variables.

1.3 Key Concepts and Definitions

The Real Exchange Rate (RER) is used as indicators of external competitiveness. Conceptually, the RER, defined as a weighted average of
nominal exchange rates adjusted for relative price differential between the
domestic and foreign countries, relates to the purchasing power parity (PPP)
hypothesis. RER can be computed both in terms of domestic currency per
foreign currency or foreign currency per domestic currency. In the present
study, we have taken domestic currency per foreign currency. The USA is
the largest world economy and biggest trading partner of India. Therefore,
taking USA as representative of world economy, we have calculated RER of
India vis-à-vis USA for use in the study. Since nominal exchange rate has
been taken rupees per US dollar, increase/ decrease in RER mean
depreciation/ appreciation. Some of the other concepts to be used in the
present study and their derivations have been discussed below.

**Productivity differential:** The productivity differential in the context of RER
studies is taken the difference between the productivity of traded and non-
traded sectors of an economy. In practice, productivity differential is
calculated taking difference between per capita income of a country and
world. In the absence of quarterly per capita income, difference in growth
rate of India and USA has been used for productivity differential.

**Terms of Trade:** Terms of trade is basically the value of one unit of exports
in terms of imports. The terms of trade have been derived taking exports as
percentage of imports.

**External sector openness:** External sector openness is the indicator of
globalisation of an economy. Generally, it is measured as exports plus import
as percentage of GDP. In the present study, external openness has been
taken in broader term and computed as sum of aggregate current account
inflows and outflows and capital account inflows and outflows as percentage
of GDP.

**Trade balance:** Trade balance is difference between exports and imports. In
the present study, trade balance has been calculated as ratio of exports to
imports. It means that increase in the ratio indicates improvement in trade balance and decline reflects deterioration.

**Output gap:** Output gap is the extent of deviation of actual output from potential output on an economy. The negative the deviation, lower the actual output from potential output. The potential output can be calculated through various methods; in the present study, it has been estimated using Hardrick-Prescott (HP) filter.

### 1.4 Period of Study and Sources of Data

Since the exchange rate is high frequency variable, it would be appropriate to undertake this study with high frequency data. In the present case, RER is available with monthly frequency, but other important variables such as GDP growth, Government consumption, foreign assets are available with quarterly frequency. It would have been better to use monthly time series, but due to above constraints quarterly time series have been used. As quarterly data on GDP growth of India is available since second quarter of 1997, the period of the study has been considered from Q2 of 1997 to Q2 of 2009.

The variables taken in the present study are real exchange rate of India against USA (RER), differential growth rate between India and USA (DG), government final consumption expenditure (GC), foreign exchange assets (FX), terms of trade (TOT), and external openness (OP), trade balance (TB), net capital flows (KF), inflation (n), and output gap (Y). The RER has been calculated taking nominal exchange rate of rupee against US dollar, wholesale price index of India (WPI) and producers’ price index (PPI) of USA. Data on India i.e. nominal exchange rate, WPI, foreign exchange assets (FX), exports and imports, current account inflows & outflows and capital account inflows & outflows are sourced from Handbook of Statistics of Indian Economy, Reserve Bank of India. Data on India’s quarterly GDP growth and Government consumption have been sourced from National Accounts Statistics (NAS) of Central Statistical Organisation (CSO),
Government of India. Producer’s price index and GDP growth of USA are taken from International Financial Statistics (IFS), International Monetary Fund (IMF).

1.5 Research Methodology

A battery of unit root tests are available to test whether the series are stationary or not. Testing of unit root property of the variables considered in the study is the first step in econometric estimation procedure especially when dealing with time series data. In the present study, unit root tests viz., Augmented Dickey Fuller (ADF), Dickey Fuller -Generalized Least Square (DF-GLS), Phillips-Perron, and KPSS have been used. First, ADF test has been applied to test the stationarity of variables. This test investigates the presence of unit root in time series data. Strong negative numbers of unit root reject the null hypothesis of unit root at some level of confidence. ADF framework to check the stationarity of time series has been given in following equation:

$$\Delta x_t = \beta_1 + \beta_2 t + \theta x_{t-1} + a_t \sum_i^n \Delta x_{t-1} + \epsilon_t$$  \hspace{1cm} (1)

Where $\epsilon_t$ is white noise error term.

Basically, this test determines whether the estimates of $\theta$ are equal to zero or not. Fuller (1976) provided cumulative distribution of the ADF statistics by showing that if the calculate-ratio (value) of the coefficient is less than critical value from Fuller table, then $x$ is said to be stationary. However, this test is not reliable for small sample data set due to its size and power properties (Dejong et al, 1992 & Harris, 2003). For small sample data set, these tests seem to over-reject the null hypotheses when it is true and accept it when it is false. Therefore, the findings of ADF test have been corroborated with other unit root tests discussed above.

Phillips-Perron (PP) unit root tests differ from ADF test mainly in how they deal with serial correlation and heteroskedasticity in errors.
Particularly, where the ADF tests use a parametric autoregression to approximate the ARMA structure of the errors in the test regression, the PP test ignore any serial correlation. The test regression for the PP test is:

\[ \Delta y_t = \beta^{D_t} + \pi y_{t-1} + \epsilon_t \]  \hspace{1cm} (2)

Where \( \epsilon_t \) is I(0) and may be heteroskedastic. The PP test correct for any serial correlation and heteroskedasticity in the errors \( \epsilon_t \) of the test regression directly modifying the test statistics.

The ADF and PP unit root tests are for the null hypothesis that a time series \( y_t \) is I(1). Stationarity test, on the other hand, are for the null that \( y_t \) is I(0). The derivation of the most commonly used KPSS stationarity test starts with the model

\[ y_t = \beta^{D_t} + \mu_t + \epsilon_t \]  \hspace{1cm} (3)
\[ \mu_t = \mu_{t-1} + \epsilon_t, \epsilon_t \sim WN (0, \sigma^2_{\epsilon}) \]  \hspace{1cm} (4)

Where \( D_t \) contains deterministic components (constant or constant plus time trend), \( u_t \) is I(0) and may be heteroskedastic. \( \mu_t \) is a pure random walk with innovation variance \( \sigma^2_{\epsilon} \). The null hypothesis that \( y_t \) is I(0) is formulated as \( H_0 : \sigma^2_{\epsilon} = 0 \), which implies that \( \mu_t \) is a constant. Although not directly apparent, this null hypothesis also implies a not moving average root in the ARMA representation of \( \Delta y_t \). The KPSS test statistics is the Lagrange multiplier (LM) or score statistics for testing \( \sigma^2_{\epsilon} = 0 \) against the alternative that \( \sigma^2_{\epsilon} > 0 \) and given by:

\[ KPSS \sim d \int_0^1 V_1 (r) dr \]  \hspace{1cm} (5)
The stationary test is a one-sided right-tailed test so that one rejects the null of stationarity at the 100 % level is the KPSS test statistics is greater than the 100.

After finding out whether there is problem of unit root or not, next logical step is to estimate the relationship with appropriate econometric technique. Since present study deals with time series data and all the level variables not stationary, it would be appropriate to some technique which can circumvent the problem of stationarity in the time series data. The data could be converted into stationary form taking first difference and relationship could be estimated with ordinary least square (OLS) regression, but there would be greater loss of information and hence, estimates may not be that robust.

Econometric literature has abundant econometric techniques to investigate relationships among non-stationary macroeconomic variables and prominent among them are univariate co-integration technique (Engle-Granger (1987)), multivariate co-integration technique (Johansen (1988); Johansen & Juselius (1990); and Johansen’s (1995)) and newly developed auto regressive distributed lag (ARDL) model (Pesaran and Shin, 1995, 1998; Pesaran et al., 1996; Pesaran et al., 2001). The recent studies indicate that the ARDL approach to cointegration is preferable to other conventional cointegration approaches such as Engle and Granger (1987), Johansen (1988) etc. mainly because of its applicability irrespective of whether the underlying regressors are purely I(0), purely I(1) or mutually co-integrated. The statistic underlying this procedure is the familiar Wald or F-statistic in a generalized Dickey-Fuller type regression, which is used to test the significance of lagged levels of the variables under consideration in a conditional unrestricted equilibrium error correction model (ECM) (Pesaran, et al., 2001). Another reason for preferring the ARDL approach over other approaches is that it is more robust and performs better for small sample sizes.
In the present study, ARDL approach has been used because of the obvious reasons cited above for its preferability i.e. all the variables are not integrated of the same order and small sample size. The ARDL approach involves estimating the conditional error correction version for variables under estimation.

Firstly, the bound test procedure is applied through modeling the long-run equation as a general vector autoregressive (VAR) model of order p, in $z_t$:

$$z_t = c_0 + \sum_{i=1}^{p} \delta_i z_{t-i} + \varepsilon_t, t = 1,2,3 \ldots , T \quad (6)$$

With $c_0$ representing a $(k+1)$ vector of intercepts (drift) and $z_t$ is the vector of variables $y_t$ and $x_t$, respectively. $y_t$ is an I(1) dependent variable and $x_t$ is a vector matrix of mixed I(1) and I(0) regressors. Further, assuming that a unique long-run relationship exists among the variables, the condition vector equilibrium correction model (VECM) can be written as under:

$$\Delta y_t = c_0 + \delta_1 \Delta y_{t-1} + \delta_2 \Delta x_{t-1} + \sum_{i=1}^{p-1} \rho_i \Delta y_{t-i} + \sum_{i=1}^{p-1} \theta_i \Delta x_{t-i} + \varepsilon_t, t = 1,2,.., T \quad (7)$$

Where $\delta_i$ are the long run multipliers, $c_0$ is the drift (intercept) and $\varepsilon_t$ are the white noise errors.

The first step in the ARDL cointegration model is to test the existence of the long-run relationship among variables with bounds testing estimating equation (7) by ordinary least square (OLS). The F-test is used for the joint significance of the coefficients of the lagged variables. Two asymptotic critical value bounds provide a test for cointegration when the independent variable are I(d) (where $0 \leq d \leq 1$). A lower value assumes the regressors are I(0) and an upper value assumes purely I(1) regressors. If the F-statistics is above the upper critical value, the null hypothesis of no long-run relationship can be rejected irrespective of the orders of the integration for the time series. On the contrary, if the test statistics falls below the lower
critical value, the null hypothesis of no cointegration cannot be rejected. But, if the value of the test statistics falls between the lower and upper bound, the result is inconclusive.

Once the bounds test to find out existence of cointegration is done, next step is to estimate long run model for $Y_t$ in the following specification:

$$lny_t = c_0 + \sum_{i=1}^{p} \delta_i lny_{t-1} + \sum_{i=1}^{q} \beta_i lnx_{t-1} + \epsilon_t$$ \hspace{1cm} (8)

Where $X_t$ is the vector of regressors ($X_1, X_2, X_3, \ldots, X_n$). The order of ARDL ($p$, $q_1$, $q_2$, $q_3$, $q_4$) is selected with SCB criteria.

In the last step, the short-term dynamic in the error correction model associated with long-run estimates is estimated to find out whether model converges to its long-run equilibrium path after some shock. The error correction model is specified below:

$$\Delta y_t = a_0 + \sum_{i=1}^{p} \phi_i \Delta y_{t-1} + \sum_{i=1}^{q} \theta_i \Delta x_{t-1} + \varepsilon_{ecm_{t-1}} + \epsilon_t$$ \hspace{1cm} (9)

Where, $\phi_i$ and $\theta_i$ are the short-term dynamic coefficients and $\varepsilon$ is the speed of adjustment.

Apart from unit root tests and ARDL cointegration model discussed above, some of basic statistics such as $f$ test, $t$ test, correlation, and Durbin Watson (DW) statistics have been used in the study.

1.6 Chapters Plan

In this study, the theoretical dynamics of the RER and its relationship with macroeconomic fundaments, the possible determinants as provided in the theory and exchange rate management in India have been analysed to set the context in perspective before embarking on the empirical investigation of the determinants and impact of RER on trade, capital flows.
and conduct of monetary policy. Therefore, the study has been divided into eight chapters including this introductory Chapter. The scheme and content of the rest of the Chapters is as follows.

**Chapter 2**

The second chapter on “Review of Literature” presents a review of the available literature on determinants of real exchange rate and its impact on trade balance, capital flows, and monetary policy reaction function.

**Chapter 3**

The third chapter entitled “Real Exchange Rate and Macroeconomic Fundamentals” covers the theoretical dynamics of RER and relationship between RER and macroeconomic fundamentals. The relationship of RER has been discussed with macroeconomic fundamentals such as productivity differential, foreign assets, government consumption, terms of trade, external openness etc., as provided in theory and empirical literature.

**Chapter 4**

The exchange rate management in India over the years has remained very critical for the dynamics in RER. It is often said that central banks target RER as exchange rate management policy across several countries. Therefore, this chapter entitled “Exchange Rate Management in India” gives a detailed account of exchange rate management in India and movements in RER.

**Chapter 5**

This Chapter has been entitled “Determinants of Real Exchange Rate in India”. After setting the proper context in the previous chapters, the chapter empirically finds out the macroeconomic fundamentals, which have been driving the movements in RER in India. These determinants have been selected on the basis of theoretical and empirical literature discussed in the Chapter II. The speed of convergence of the RER towards its long-run equilibrium path is also estimated in the chapter.
Chapter 6

After estimating the determinants of RER in the preceding Chapter, the Chapter entitled “Impact of RER on Trade and Capital Flows” investigates empirically the impact exerted by RER on trade balance and capital. The Chapter has been divided into two Sections. Sections 6.1 covers the impact of RER on Trade Balance in India, while the impact of RER on capital flows has been given in Section 6.2. The impact of trade balance has been estimated as per Marshall-Lerner (ML) condition.

Chapter 7

In an open economy, exchange rate affects economic activities such as trade, investment, inflation, growth etc. therefore, with increasing openness of the economies, central banks around the world have started responding to the exchange rate. Chapter 7 estimates the influence of RER in the conduct of monetary policy in India using the augmented Taylor (2001) rule framework for an open economy.

Chapter 8

The last Chapter entitled “Summary & Conclusions” gives the summary of the conclusions drawn from the Chapter 5 to Chapter 7 and policy implications. This Chapter also gives the scope for future research.