PART I
CHAPTER I

INTRODUCTION
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INTRODUCTION

1.0 Abstract

The objective of this chapter is to introduce and explain the topic of the thesis, concept of exchange rate, determination of exchange rate and its fluctuations, stability Vs fluctuations, rationale of the choice of the topic, importance and scope of the study. The objectives of research and hypotheses/ research question are described. The chapter scheme of the thesis is also briefly introduced.

1.1 Introduction

Review of 142 studies relevant to the topic of research, available in literature, reveals that the growth effect of exchange rate fluctuations has not received attention of researchers so far. This appears as a research gap in the area of international trade, though numerous other aspects of exchange rate such as relation between foreign exchange, equity and gold markets, determination of exchange rate, inter-relation between such macro variables as fiscal deficit, inflation and exchange rate have been investigated by researchers. The present study titled ‘Impact of Exchange Rate Fluctuations on Trade Balance and Growth’ seeks to fill up this gap in research.

1.2 Exchange Rate: Concept

Exchange rate is the combination of two words: rate and exchange. Rate refers to the value/price at which transactions take place, and exchange is the process of buying and selling. The process of buying and selling necessitates determination of price of commodities or service entailed in exchange. Price of money/currency also behaves like commodity prices. Prices of goods and services are determined in terms of money, value of money, in turn, is shown in quantities of goods and services that money can buy. The domestic price of national currency is expressed by its purchasing power of goods and services in the market. Similarly, external value of national currency may be expressed by its purchasing power of in terms of goods and services in foreign market. But currency of one country is not accepted as medium of exchange in other countries. So, domestic currency has to be converted in to foreign
currency in foreign exchange market. The conversion rate is defined as exchange rate. Purchasing power of national currency in foreign markets is expressed in foreign currency, generally US dollars, Euro or a basket of 10 currencies. The foreign currency is the medium of exchange in external market. Exchange rate is the external price of domestic currency. Purchasing power of foreign currency in national market is measured in domestic currency.

Each country has commodity, services and financial markets. Foreign Exchange market is one of the financial markets. Capital market deals with the determination of prices of (i) equity or stocks, and (ii) interest rate as the price of loan capital. All markets have two segments: (a) spot market, and (b) futures market. Both segments of the markets are intimately related. This is true for exchange market also. Besides, commodity, real estate, gold, and foreign exchange markets are intimately related with one another. This is especially true for futures’ market. It is hypothesized that foreign exchange rate is related to interest rates, stock prices, gold prices and real estate prices. Investment funds are transferred from one to another market under specific conditions. Investment, both domestic and foreign, in stocks, goes as capital into production sectors of the economy. Export earnings and profits received from abroad also constitute a source of capital formation. There is an intricate web of interrelations among all financial markets. Investment in foreign exchange’s futures market has to compete with the commodity, gold, real estate and stock’s futures market.

1.3 Determination of Exchange Rate and its Fluctuations

Like other prices, exchange rate also changes with the changes in the state of market. Just as other prices depend on supply and demand, exchange rate also depends on the configuration of forces of supply and demand. However, two important facets have to be noted: (i) Unlike goods and services, foreign exchange has no direct cost of production. It has only opportunity cost. Import bills have to be paid through export earnings. So cost of production of exportable surpluses may be taken to constitute the direct production cost of exports and indirect cost of imports. Opportunity cost is accounted by with drawl of exportable surplus from domestic consumption. Fluctuations are a natural characteristic of foreign exchange rate market, provided that the exchange rate is not an administered price. If exchange rate
is an administered price, it is determined administratively by the central bank of the country. Administered foreign exchange rate is generally endowed with stability as both demand for and supply of foreign currency is under the control of central bank.

Exchange rate, on the whole, fluctuates like other prices, which generally varies with change in demand and/or supply. Imports, foreign aid, investment in other countries and remittance of profits abroad are the major sources of demand for foreign exchange. Export earnings, foreign investment in the domestic market, foreign aid from other countries and receipt of remitted profits from other countries, remittance of NRI earnings are the major sources of supply of foreign exchange. A change in any of these brings about a change in supply and demand for foreign currency. But imports and exports are the major sources of demand and supply of foreign exchange. Demand for foreign exchange increases with imports, investment in other countries, profits remitted to other countries and foreign travels etc.

1.4 Stability Vs Fluctuations

The adjective ‘Fluctuations’ is an indicator of instability in foreign exchange market. The concepts of stability and instability are often contrasted. Classical economists assumed the ‘stability of equilibrium’ a la Say’s Law of Markets. Thus, they assumed away the facet of instability of the system. Leo Walras (1874) furnished the first concept of ‘stability and associated it with the dynamic process of tatonment with a view to eliminate divergences between demand and supply prices on offer in the market at the given point in time. Adjustment process remains in operation till supply and demand prices coincide. Once the divergence between demand and supply price is eliminated equilibrium prevails in the market. Obviously, stability is seldom a problem in a stationary or static system. Actual systems are, however, dynamic. Concept of ‘stability’ has thus a dynamic system as its context.

Difficulty in analysing di-equilibrium systems has probably discouraged economists to analyse instability empirically. This may also probably explain the popularity of Computable General Equilibrium Models. Hicks and Samuelson may be cited as exceptions to general apathy, though they also focused on stability/ instability in the general equilibrium framework.
The two concepts of stability, enunciated by Hicks (1939) and Samuelson (1941), have been related to the general equilibrium. Both Hicks and Samuelson used the ideas of Warals (1874). Hicks states that ‘a fall in the price of X in terms of the commodity’. Hicks retain the assumption of static state to allow corrective change in demand through the change in price to restore equilibrium. But ‘inverse relation between the derivatives of ED (excess demand) is negative at the equilibrium point under smooth demand function for X’. Samuelson’s proposition extended the concept of stability to the dynamic system of tatonnement of Walras. But such a system requires a new agent like the market secretary or auctioneer, who is in charge of varying the price if demand differs from supply. The process continues till the price that clears demand in this reached. Auctioneer or Secretary of the market is an artificial construct except the agriculture and auction markets. The dynamics of tatonnement not derived from such preferences of individuals as maximize the objective function subject to constraints entailed in the information perceived by individual agents. These imperfections partly explain the want of interest in the analysis of stability by many economists.

Let us state that we are here concerned with the stability of actual external price of domestic currency rather than the stability of its equilibrium price. The price (exchange rate) stability embodies both conceptual and methodological problems in so far as empirical measurement is concerned. If the exchange rate does not change at all over a period of time, as is the case under administered price mechanism, question of instability does not arise. So instability arises from temporal changes in market based exchange rate. Then, what is the dimension of change, absolute or relative, that may be associated with stable exchange rate? Relative price of national currency may be considered to be the criterion of stability. It may be suggested that the average, calculated by exclusion of extremely high or low changes as outliers, may be acceptable as standard for this purpose.

Then, $\bar{X} \pm \sigma$ may be accepted as admissible range of variation under the conditions of stability. Assumption underlying this is that the temporal changes in exchange rate are normally distributed. In a growing system, excess demand or supply cannot be ruled out. So exchange rate cannot be envisaged to remain constant through time. Dynamics of stability is, however, associated with the formation of expectations. But expectations not only differ among individuals but individual’s
expectations also tend to change frequently from time to time. So, the concept of stability is associated with temporary equilibrium which is embodied in equilibrium of expectation. Stable Equilibrium, therefore, denotes realization of expectations of the agents in the market. ‘A state in which the expectations of most of the agents have been realized may be defined as equilibrium of expectations’ (Cf. Boulding, 1972). It highlights the crucial role of expectations in endowing equilibrium with instability or its characteristic as being temporary in time horizon because it does not last outside the period under consideration due to changing expectations. The series of temporary equilibria embody either excess demand or excess supply that percolates into next period. This is the feature of flex price markets.

No concept of stability has been imported into the analysis of financial markets in general and stock and exchange markets in particular, a few studies of volatility of stock markets notwithstanding. Foreign exchange market is no exception to this. If, however, we distinguish between spot and futures trading in these markets, this may easily be imported into the analysis of financial markets, including foreign exchange market.

1.5 Two Mechanisms of Rate Determination

The mechanism of determination of exchange rate may be distinguished broadly into two categories: administered and market based. Besides, in second category, outflows of exchange may be under full convertibility on revenue and/or capital account. Under administered price regime, fluctuations in exchange rate are not associated with the official rate; black market rate does show fluctuations. In market oriented exchange rate regimes, central bank may be induced to intervene if the rate moves in a non-acceptable band. The intervention occurs through the sale and purchase of foreign currencies by the central bank in the market. Subject to this limitation, market based exchange rate fluctuates on day to day basis. These changes comprise both benefits and losses to individuals, organizations, and economy. International travellers, for example, will gain if the value of their domestic currency falls, while an appreciation will inflict loss. Export and Import houses and service providers for international business, such as shipping, insurance and banking companies also loose or gain in the market due to rate fluctuations. The companies, making huge investment in international business, may lose or gain relatively more.
Quantum of in and outflows of foreign investment will naturally be directly affected by rate fluctuations which, in turn, will affect stock market. Fortune of the corporate houses in general and export and import houses in particular is affected directly.

If the Indian rupee appreciates, it will have diametrically opposite effects. Gross terms of trade and exchange earnings will rise per unit of exports. However, overall export earnings may be adversely affected as Indian exports may lose an edge in international market due to rise in prices. It may ultimately become counterproductive. All such changes, taken together, affect the economy, business and growth. The study focuses specially on the effect of exchange rate fluctuations on export earnings, imports and output of different sectors of the economy.

Developing countries face scarcity of foreign exchange in the initial stage of development, when such countries move away from stagnancy. This problem was earlier sought to be mitigated by foreign aid since export earnings fell short of requirements. If a country could not receive adequate aid, which normally was the case, it was left with two options: first, exports should be increased; and second, imports should be restricted or both. Since capacity to produce export goods (exportable surplus) was limited and only a few goods were exported, export promotion was not an adequate option. So import restrictions offered supplementary measure to restrict liability to pay huge import bills. But import of all goods could not be restricted, since imports of any country, including developing countries are not homogenous; imports of developing countries fall in to the following categories: Competitive and Non-competitive. Competitive imports refer to such goods as could be substituted for domestically produced similar goods. These goods may further be classified into essential goods and goods needed for production. Essential goods may have to be imported regularly or occasionally if the domestic output falls short of requirements. Same applies to goods needed for development. Such goods may fall in the category of raw materials, finished and semi-finished producer goods which are generally used as intermediate or capital goods. Non-competitive imports relate to such goods as were not currently produced in the economy at all. Both these type of imports may further be classified into imports of essential goods for development and goods essential for consumption. Essential consumption will relate to such necessities as food, cooking medium, fuels, etc.
It is extremely difficult to restrict imports of essential goods either for consumption or development. Promotion of exports to earn maximum foreign exchange rather than restriction of imports is the better option. Sources of imports are generally many. But exports are limited by supply constraints. Besides, developing countries, including India were producers and exporters of primary goods and some simple manufactures like textiles and most of the developed countries imposed quota and tariff restrictions on imports of such goods for protecting domestic producers. Consequently, countries like India followed the policy of import restriction and supplemented it by substitution of imports by domestic production. Policy of import restriction and substitution of imports by domestic production, especially the production of producer goods was used along with the policy of export promotion to meet bulging exchange requirements. This policy mix offered a better option in the then prevailing conditions. Restriction of imports focuses on containment of demand for foreign exchange, while policy of export promotion focuses on raising foreign exchange earnings.

A variety of measures are adopted to restrict demand for foreign exchange. Such policies diverge a great deal from free trade policy which may also encompass either free capital or free current account or both free accounts policies for the release of foreign exchange. Free trade is postulated as an engine of growth. The developing countries face the paradox in initial stage of development that these countries have
few goods with limited surplus in export baskets while their need for imports to meet development requirements are huge in magnitude. In the post second world war scenario, international environment was highly conducive to promote foreign aid for the development of developing countries. But this changed after the first oil crisis in early seventies when developed countries displayed aid weariness. The foreign donors and international agencies like IMF and IBRD advised developing countries to raise capital from the market rather than to seek aid from international agencies or from developed countries individually. This is the general backdrop of this study.

1.6 Indian Concerns

After attainment of political independence in 1947, the following were main Indian concerns: (1) capital scarcity, (2) vintage technology, (3) need for modernization and technology upgradation in general and export goods industries in particular, (4) scarcity of food despite India being an agriculture country, (5) domination of primary production in economic structure (6) extremely low capital base of production, and (7) diversification of export basket.

The foreign exchange requirement for development of a vast country like India was far too huge to be fully met by either export earnings alone or foreign aid alone. Import restrictions also offered limited scope for meeting the challenge of transforming a backward, agrarian and under-developed Indian economy into a modern industrialised and developed one. Consequently, after independence, India adopted a mix policy package of import substitution, foreign aid, and promotion of exports. These policy measures were supplemented by measures of exchange control.

Substitution of imports by domestic production was also warranted by (i) diversification of structure of the economy through industrialization, and (ii) attainment of self-reliant and self-sustained long run development by the creation of capacity to produce producer goods like machinery, plants and equipment, the carriers of technology. Import substitution and exchange control measures resulted in partial if not total closure of the Indian economy. All these measures were designed to promote rapid industrialization based on heavy and basic goods industries to make India self-sufficient and self-reliant in the long run.
The impact of these policies was that India could not achieve the pace of growth that especially South-East Asian countries such as South Korea, Japan, Thailand and Singapore could achieve. One reason is that India inherited a stagnant economy with zero percent growth of GDP, negative growth of per capita income, rehabilitation of more than one million refugees and to import the erstwhile domestically raw materials like jute and long staple cotton to keep its export industries working. The other reason is that gestation periods of basic and heavy goods industries are long, investment is huge, and returns are low. Besides, the entrepreneurial base was also extremely limited (Prakash, Shri, 1994). These industries were established in public sector which is not known for proficiency and high productivity. R & D was also not given adequate attention by these enterprises. So, technology, embodied in their products, was also dated. Therefore, in 1990-91, major reforms in economic policy were implemented. Under economic reforms, drastic reduction in import duties/tariffs was effected. The maximum reduction on duty on most of the commodities was aimed at liberalizing imports, though the reductions in duties varied among commodities. One of the objectives of reforms and trade policy were to open the Indian economy to foreign competition both in domestic and international markets. Other objective was to have an access to new technology and foreign investment to overcome the technological obsolescence and scarcity of capital.

A related area of reforms was the removal of exchange control and the replacing of administered by market based exchange rate. However, even in the new policy scenario, Reserve Bank of India intervenes in the market, if exchange rate fluctuations go beyond specified limits. The policy of partial capital account convertibility has also been adopted. The market based exchange rate fluctuates from day to day. Downward change in the value of rupee makes Indian exports cheaper and imports costlier, which directly affect the magnitude/quantity of exports and imports as well as earnings and outgoes of foreign exchange. The fluctuations in quantities of exports and imports affect output, employment, foreign exchange earnings and reserves. To the best of my knowledge, the problem of output effect of exchange rate fluctuation has not been investigated by any researcher so far. This observation is based on the review of literature that I have conducted so far.
1.7 Rationale of the Choice of the Topic

The topic of my research “Impact of Exchange Rate Fluctuations on Trade Balance and Growth” falls in the domain of international trade. Some of the studies have focused on the determination of exchange rate, while a few studies examine the relationship between exchange, commodity and stocks markets. The studies reviewed so far indicate that this aspect of exchange rate fluctuations has been examined by very few studies. None of these studies relate to Indian economy. Methodologically, none of these studies have used input-output model to determine the growth effect of exchange rate fluctuations. Consequently, such studies have not captured both direct and indirect effect of exchange rate fluctuations on growth of GDP. This study seeks to do this. The studies conducted so far have mainly focused on the evaluation of volatility of exchange rate by ARCH, GARCH, E-GARCH models. Incidentally, these models attempt to (i) take cognisance of the violation of the assumption of constancy and equality of all error variances (ii) non-constancy and inequality of error variances do not automatically imply volatility of exchange rate. Errors of estimation by OLS and the variances of these errors are entailed in the inappropriateness of procedure of estimation, these error variances cannot be considered to reflect the volatility of exchange rate. The volatility relates to the wild swings in the magnitude of changes. Thus, there appears to be methodological, empirical and theoretical gaps in research in this area which prompted me and my guide to select the topic of research.

1.8 Importance of the Study

The importance of this study of exchange rate fluctuations has acquired even more importance recently in the light of continuous fall in the value of Indian rupee against US dollar when value of rupee touched almost Rs 60 per US dollar. Consequently, a new band of fluctuations of the value of Indian rupee in US dollar has come into existence. The value of rupee fell down to its record historical low value of Rs 57.37 per dollar on 22nd June 2012. Subsequently, rupee went further down in the market though it has recovered a bit of lost ground. The serious consequence of continuous fall in value of rupee is the increased prices of imports’ it has been further aggravated by rising prices of crude oil and gold in international market. Incidentally, imports of oil and gold constitute the largest drain on foreign
exchange reserves of India. The prices of gold, LPG gas, diesel and petrol have been raised further in domestic market. This has accentuated inflationary pressures in Indian economy. The value of rupee has continuously been fluctuating since February 2012. These fluctuations forced the government to enter into currency swapping agreement with Japan.

To the best of my knowledge only a few researches have been done related to this topic directly or indirectly. Generally, the fact that the economies are characterized by mutual inter-dependencies is missed by researchers, who use econometric models. Input output model is an appropriate method/model to capture both direct and indirect components of relations between different variables/ sectors of the economy. But this model has not been used in investigations. Though R.N. Bharadwaj, Debesh Chakravarti and Kakali Mukhopadhaya have used input output modelling in the analysis of problems of India’s international trade, but they have also not examined the problem of growth effect of exchange rate fluctuations. Input output model is one that captures both direct and indirect effect of change in an exogenous or endogenous variable. Thus, this research investigation is designed to fill up an identified gap in existing stock of knowledge related to international business, especially trade.

Export earnings, demand for export goods and their prices both within and outside the country, and exchange rate are highly related. Change in exchange rate directly affects the prices of Indian imports in domestic market and prices of exports in external markets, which in turn influences external demand. India has to compete with other countries’ exports in its export markets. Competition is both price and non-price competition. For example, even though the oil/petroleum prices have been declining in international market, drastic depreciation of rupee in the last three months of 2012 have led to a rise in domestic prices of diesel, petrol, and CNG. Such changes in prices have cascading effect on almost all prices. Quantity and price changes in response to change in exchange rate directly influence export earnings. However, the quantity of change in demand depends upon price and income elasticity of export goods in international markets.

If rupee appreciates, it increases dollar prices of exports and high dollar price leads to the decline in demand, quantity, volume, and export earnings. Lower earnings
have negative impact on development. As against this, if the rupee depreciates, Indian exports become cheaper in international markets, the demand for Indian exports and export earnings rise leading to consequent growth of export production, and hence growth. However, imports become dearer leading to rise in import bill and consequent greater draining of exchange earnings. The effect of rupee appreciation may captured by price elasticity. The above chain of changes may be explained by the following chart.

Figure 1.2 Impact of Price Elasticity on Exports

1.9 Scope of Investigation

The study mainly focuses on the evaluation of effect of exchange rate fluctuations on (1) export earnings, (2) import bills (3) trade balance, (4) growth of output of Indian economy, (5) effect of technological change on output via export earnings.

The study also focuses on changes in direction and composition of trade. The study covers the period from 1980-81 to 2010-11. Thus, part of new economic policy era in Indian economy from 1990-91 to 2010-2011 is covered by the study.
The impact of exchange rate changes on (i) Balance of Payments (BOP) and (ii) Gross, Net and Income Terms of Trade (TOT) are beyond the scope of the study. Balance of Trade (BOT) and Balance of Payments (BOP) differ in one respect: BOT relates only to Merchandize Trade, while BOP also includes import and export of Invisibles and inflows and outflows of capital.

Exchange rate fluctuations are directly related to dollar prices of imports and exports, while change in import and export prices affect demand for exports in international markets on the one hand, and demand for imports in Indian economy on other hand. All these changes directly affect merchandise trade and balance of trade. Balance of trade is different from balance of payment. Balance of payments comprise the difference between export earnings and import bills which constitute a major part of balance of payments; but BOP also comprise inflows and outflows of foreign investment and import and export of invisibles. As total export earnings are included in the study, the need for analysis of trade in invisibles and the related amount of exchange earnings is not considered to be necessary for the analytical purposes of this study. Besides, exchange earnings and outgoes on account of invisibles constitute a small proportion of the total.

FDI and FI still constitute a small part of Indian economy; it accounted only for 0.5% of total investment in Indian economy in 2008-09 (Prakash and Panigrahi 2013). Besides, invisibles are also not a major part of BOP in Indian case. These factors prompted me to exclude BOP from the scope of the study. Its inclusion would have also required the analysis of inflows and outflows of foreign investment, which requires, in my opinion, a separate in-depth study.

Terms of trade are another facet of international trade, which is beyond the scope of this study. No doubt, exchange rate is an important determinant of gross, net and income terms of trade (TOT). But analysis of (TOT) is a subject of research in its own right. Extensive research has already been done on this subject both in India and abroad (See for example, Raul Prebisch, 1964, Dr Bharat Ram, 1966, Shri Prakash, et. al., 1995, S. Prakash and Sonia Dheer, 2012). Obviously, inclusion of BOP and TOT as a part of the study would have expanded the scope of the study hugely.
1.10 Nature of the Study

The study is mainly empirical in orientation, methodological in thrust, and exploration of theoretical paradigm. The study is empirical in view of the fact that effect of exchange rate fluctuations on Indian economy is being analyzed on the basis of data. The methodological thrust of the study is derived from the fact that models are to be applied to empirical observations of India’s foreign trade. Though Leontief’s input output model has been extensively used for evaluating Leontief paradox in the context of Factor Endowment theory and Import intensity of exports, no study has been done for evaluating output effect of exchange rate. Besides, input output model is also used for the isolation of the impact of technological change and exchange rate change on output turn by turn. Further this study relates exchange rate fluctuation with economic growth. This I trust is innovative, since isolation of impact on growth of exchange rate fluctuations independent of any change in technology, and isolation of impact of change in technology independent of any change in exchange rate add a new element to the study. The study also examines the joint impact on growth of change in technology and exchange rate change. The study covers only trade balance. The study is partially theoretical so far as it seeks to explore theoretical paradigm to explain the output effect of exchange rate fluctuations on Indian economy. Analysis of determination of exchange rate and inter relation of exchange market with other markets like stock, gold, real estate and futures is beyond the scope of the study.

1.11 Research Questions and Objectives

In the context of the study, first two research questions are:

1. Does exchange rate fluctuate too much in Indian exchange market? In other words, do appreciation or depreciation of Indian rupee verges on volatility?

2. Do exchange rate fluctuations influence export earnings and import bills? Then, what is the degree and direction of the effect of such exchange rate fluctuation?

3. Export earnings and import bills, however, change from time to time due to several factors including prices, quantities and both domestic and other
countries’ policies. Answer to first question needs determination of the frequency and band in which the exchange rate fluctuations occur.

Exchange rate fluctuations are one of the several factors that influence export earnings and import bills. So, third important research question is:

4. Can we isolate and estimate the effect of exchange rate fluctuations on export earnings and import bills by impounding the influence of other factors?

5. Exchange rate fluctuations affect earnings and import bills through their impact on prices of export and import goods. But composition of trade also affects the earnings and bills since prices and quantities of different foods may be affected differently.

Next question is:

6. Do exchange rate fluctuations affect the composition of trade?

The demand for Indian export goods may face (i) differential degrees of competition in different markets, (ii) differential degrees of elasticity of demand in different markets. Therefore, export and import of different goods may be affected differently by the given change in exchange rate.

Other related question is

7. Do exchange rate fluctuations affect the direction of trade?

Different markets require different goods and export to India different goods which may make the impact of exchange rate fluctuation affect different markets differently.

Technology is an important factor which affects cost of production, and hence price, and quality of the products. Besides, technological and structural changes associated with technological change may lead to entry of new goods and exit of earlier goods from export and import baskets. Decomposition of the effect of technology and exchange rate on growth of output will facilitate answer to this question.

Question that follows the above questions is:

8. Do technological changes affect growth of output?
Since exchange rate fluctuations affect export earnings and import bills directly, exchange rate fluctuations are expected to affect growth of output also.

9. The question whether exchange rate fluctuations affect growth of output of all or only such sectors as are involved in trade require a detailed answer.

Each of these questions constitutes an objective of research. But an objective of research may lead to more than one question, one research question relate to one objective of investigation only.

There exists a close relationship between the objectives/research questions of investigation and hypotheses formulated for empirical testing. Hypotheses are an instrument of determining whether objectives of the investigation have been realised/attained.

1.12 Alternative Approaches to Hypotheses Formulation

There are two approaches to the formulation of hypotheses:

1. Traditional approach of formulating of a pair of null and alternative hypotheses. Each pair of hypotheses relates to an objective of research. So the number of pairs of hypotheses under this approach and the objectives is generally equal. As reality is too complex to be compressed in two alternative hypotheses, this approach leaves gaps in investigation. This limitation is overcome by nested approach.

2. Second but modern approach is defined as the Nested Approach. Under this approach, there is no pairing of null and alternative hypotheses, or one to one correspondence between the number of objectives and number of hypotheses. Besides, hypotheses are also not paired into null and alternative; all hypotheses are generally on equal footing. All hypotheses under this approach are alternative to each other. Besides, there can be more than one hypothesis corresponding to a given objective/research question. This approach serves two purposes:

(i) It helps in selecting methods/models which suit the given research objective best if the investigator experiments with alternatives methods/models in empirical investigation; and (ii) It enables the investigator to select the most appropriate
hypothesis/theoretical prognostication out of a more varied and more numerous alternatives in the choice horizon. This explains why I have included such a large number of hypotheses. Each hypothesis in this approach offers a different alternative. This results in comprehensive analysis of the topic.

1.13 Nested Hypotheses

Hypotheses are grouped according to the nature of research question in focus.

(I) Exchange Rate and Export Earnings

H₁: There is no relation between exchange rate fluctuations and export earnings.
H₂: There is extremely weak relation between exchange rate and export earnings.
H₃: There is strong relation between exchange rate and export earnings of selected goods which are both price and income elastic.
H₄: Export earnings fluctuate in the same proportion in which exchange rate fluctuates.
H₅: A slight change in exchange rate leads to a big change in export earnings.
H₆: A big change in exchange rate leads to a slight change in export earnings.

Magnitude of big or small impact will be determined empirically. Testing of statistical significance of differences (proportions or means) will facilitate answer to such questions.

(II) Exchange Rate and Import Bills

H₁: Import of goods essential for consumption or development is not affected by exchange rate fluctuations.
H₂: Exchange rate and its changes affect imports of only non essential goods greatly.
H₃: Import bills fluctuate in the same proportion in which exchange rate fluctuates.
H₄: A slight change in exchange rate leads to a big change in import bills.
H₅: A big change in exchange rate leads to a slight change in import bills.
(III) Exchange Rate and Growth of Output

H_1: There is no relation between growth of output of any sector of the economy and exchange rate.

H_2: Growth of output of all sectors of the economy is positively related with exchange rate and its changes.

H_3: Growth of output of all sectors of the economy is negatively related with exchange rate and its changes.

H_4: Growth is positively related with exchange rates and its changes but output increases more than proportionally than exchange rate.

H_5: Exchange rate fluctuations affect the output of only export goods sectors and output of goods of other sectors is not affected.

H_6: Exchange rate fluctuations affect the output of all goods irrespective of their position in trade.

(IV) Exchange Rate and Prices

H_1: Exchange rate fluctuations do not have any impact on dollar prices of exports and imports.

H_2: Exchange rate fluctuations directly affect dollar prices of both exports and imports.

H_3: Exchange rate fluctuations do not have great impact on dollar prices of exports and imports.

H_4: Exchange rate fluctuations affect dollar prices of all export and import goods.

H_5: Exchange rate fluctuations affect dollar prices of different export and import goods differently.

(IV) Exchange Rate and Direction of Trade

H_1: Exchange rate fluctuations do not affect direction of trade.

H_2: Exchange rate fluctuations directly affect direction of trade.
H3: Exchange rate fluctuations do have some but not great impact on direction of trade.

(V) Exchange Rate change and Technological Change

H1: Both exchange rate changes do not have impact on economic growth.

H2: Exchange rate changes and technological changes both are directly related with growth of output.

H3 Technological changes directly affect the growth of output of all sectors goods of which enter into export basket.

H4 Technological changes are not directly or indirectly related with growth of output of export goods.

Above hypotheses have been empirically evaluated. The magnitude and direction of relationships indicate the acceptance or rejection of specific hypotheses.

1.14 Chapter Scheme

For systematic and ordered presentation of findings of research investigation, thesis is classified into three parts:

Part I

First part comprises three chapters;

1. Introduction - This chapter explains the nature, scope and importance of the problem of investigation.

2. Review of Literature - Second chapter focuses on the review of literature. The review of studies is classified into two categories; (i) studies directly related to the topic of investigation; and (ii) studies which are indirectly related to the topic of research. A table has been prepared on the basis of which a weighted index of studies reviewed is presented.

The review highlights the relevance of the studies reviewed for this investigation and the limitations of the reviewed studies. On the basis of table relating to review of literature, a composite index is prepared. This index highlights the degree
of gap in knowledge in the area of the topic of the thesis. Lower the value of the index, greater is the knowledge gap; and greater the value of index, greater is the repetitive or imitative nature of investigation.

3. Sources of Data, Methods, Models and Descriptive Analysis - Third chapter list the sources of data and it focuses on the nature and extent of data available from secondary sources. The chapter also outlines the methods and models used in the study. An attempt is made to select appropriate statistical methods of data analysis, and evolve mathematical models to study the problem. Besides, this chapter deals with descriptive statistics of the data. This chapter highlights the basic features of data and distribution underlying the observations.

Part II

This part contains two chapters which deal with the data and the results derived from analysis of the same.

4. India’s Trade with Selected Countries - This chapter deals with the analysis of India’s trade with Iran and five East African countries. Iran is an important trade partner, especially for satisfying India’s energy needs. Africa in general and East Africa in particular is a part of ‘look East’ foreign policy of India. Economic thrust is an important part for the realisation of diplomatic and political objectives of the nation. This has acquired an edge in view of the fact that both China and India are competing with each other in the acquisition of stake in energy resources of various countries in Middle East and Africa on the one hand and having close political relation with the chosen countries on the other. Therefore, these countries are selected as special case.

5. Direction and Composition of India’s Trade - This chapter deals with the analysis of change in direction and composition of trade in the process of growth and transformation of India’s economic structure and factor endowment (See, Prakash, S. and Dheer, Sonia, 2012a, 2012,b).

Part III

This part deals with main thrust areas of the study and comprises three chapters.
6. Decomposition Model - The chapter focuses on decompositions of total exchange earnings of India. Decomposed earnings comprise three elements: change in earnings accounted by changes in exchange rate, change in earnings accounted by changes in quantity and price. The chapter estimates contribution of each component to total earnings separately and jointly.

7. Impact of Exchange Rate Fluctuations, change in Final Demand and Technology on Growth of Output - The chapter examines impact of changes in exchange rate on export earnings, import bills. The chapter also examines impact of changes in final demand, technology on export earnings and growth of output and relation between linkages and growth of output.

8. Findings, Conclusion and Policy Implications - The last chapter contains conclusions, findings, policy implications, and scope for new research. Limitations of the study are also stated.

The thesis is finally concluded with suitable references, appendices and tables.