IMPACT OF FOREIGN INVESTMENT FLOWS ON INDIAN ECONOMY IN THE POST LIBERALISATION ERA

Thesis Submitted to the University of Calicut
for the Award of the Degree of

Doctor of Philosophy in Commerce

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DECLARATION

I hereby declare that the thesis entitled "**Impact of Foreign Investment Flows on Indian Economy in the Post Liberalisation Era**" is a bonafide record of research work done by me, under the supervision of Dr. Thomas Paul Kattookaran. I further declare that no part of the thesis has been presented before fully or partially for any degree, diploma or other similar title of the University.

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Twenty five years have passed since Indian economy began to experience and experiment with foreign investment. Much has been heard - both positively and negatively- about its impact on the economy from the common parlance, policy makers and academic world. This study is an attempt to verify what is heard and delve deep into the impact of foreign investment on the Indian economy. In other words this study is an attempt to understand and analysis how strong is the grip of the foreign investment on Indian economy through its two arms - FDI and FPI.

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Tom Jacob

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Abbreviations

AIC	Akaike's Information Criterion
ADRs	American Depository Receipts
ADF	Augmented Dickey Fuller Test
ANR	Average Nifty Return
APT	Arbiterage Pricing Theory
ARCH	Autoregressive Conditional Heteroskedasticity
ARDL	Auto Regressive Distributed Lag
ASR	Average Sensex Return
BoP	Balance of Payments
BSE	Bombay Stock Exchange (Sensex)
CAD	Current Account Deficit
CMR	Call Money Rate
COP	Crude Oil Price
DIPP	Department Of Industrial Policy & Promotion
ECB	External Commercial Borrowings
ECM	Error Correction Model
ECT	Error Correction Term
EG	Engle and Granger Co-integration
ER	Exchange Rate
FDI	Foreign Direct Investment

FER	Foreign Exchange Reserve
FI	Foreign Investment
FII	Foreign Institutional Investment
FIIs	Foreign Institutional Investors
FPE	Final Prediction Error
FPI	Foreign Portfolio Investment
FTA	Free Trade Agreement
GCC	Gulf Cooperation Council
GARCH	Generalized Autoregressive conditional Heteroskedasticity Model
GDP	Gross Domestic Product
GDRs	Global Depository Receipts
HQ	Hannan-Quinn's Information Criterion
IR	Interest Rate
IIP	Index of Industrial Production
IRF	Impulse Response Function
L	Natural Logarithm of the Variables
LR	Log Likelihood Ratio
M3	Money Supply (Broad Money)
MC	Market Capitalization
MNC	Multi National Corporation
NSE	National Stock Exchange
NCF	Net Capital Flows
NEER	Nominal Effective Exchange Rate
NDCC	Non-Debt Creating Capital
OLS	Ordinary Least Square Techniques
RBI	Reserve Bank of India

REER	Real Effective Exchange Rate
SEBI	Securities Exchange Board of India
SIC	Schwarz's information criterion
SMR	Stock Market Return
TBR	Treasury Bill Rates (T-bill rates)
TO	Trade Openness (Export + Import/ IIP)
VAR	Vector Auto Regression
VDC	Variance Decomposition
VECM	Vector Error Correction Method
WPI	Wholesale Price Index

Chapter 1

Introduction

Mutual dependence between countries is as old as human civilization. From time immemorial countries seek different forms of capital either as aid, loan or investment from other countries. Globalization and the factors which accelerated this process - decolonization, the emergence of new states and their dependence on developed countries, development of international organizations like UNO, decline of communism, development of information technology etc. have revolutionized the quantity and quality of this mutual dependence. Now in the race of development, all the countries of the world, mutually recognizing and respecting their sovereignty, seek aid, loan or investments from other countries or invest in other countries in an unprecedented manner. If in the past, colonial powers (the present developed countries) were competing to invest in their colonies as part of their colonization, today the developing countries (the former colonies) are competing to receive investments from the developed countries.

In the present scenario, countries especially underdeveloped and developing prefer investments from foreign countries. These countries, allow foreign investments[1] in their countries generally in two ways i.e., Foreign Direct Investment known as FDI[2] and Foreign Portfolio Investment (investment in the capital market) known as FPI[3]. Foreign investment, widely known as non-debt capital,

[1]Foreign investment has two aspects - the investment made by a country or its citizens in other countries as well as the investment received by a country from other countries and their citizens. It is in the latter sense foreign investment is commonly conceived and this study deals solely in this sense.

[2]Foreign Direct Investment (FDI) is an investment in the form of controlling ownership in a business in one country by an entity based in another country.

[3]Foreign Portfolio Investment (FPI) is investment by non-residents in Indian securities including shares,

is destined to play a crucial role in the economy of the host countries and many countries provide incentives for attracting foreign investment in their countries, acknowledging the serious dangers inherent in foreign investments. India is not an exception to this phenomenon. Since 1990 India kept the door of her economy wide open for foreign investment and even since billions of foreign capital is flowing to India in the form of FDI and FPI. Investment, whether it is domestic or foreign, is not an accidental occurrence. As far as foreign investment is concerned the circumstances of the home countries of the investors - their regulatory framework, profitability of domestic investment etc.- along with the political and economic conditions of the host countries - political stability, economic policies of the government, the health of the host economy reflected in the rate of inflation, balance of payments position, exchange rate, growth rate, overall macroeconomic stability etc. together with the global factors like peace and security, financial stability, general economic progress are the deciding and determining factors of investment.

The crux of the problem of the developing countries, is lack of development which is mainly associated with scarcity of capital. This fact makes foreign investments relevant and significant. Hence foreign investment because of its gigantic size and non-debt quality ought to have prima facie impact on the economies of the host countries and these investments have a vital role to play in the host economy which prompt the governments to liberalize their economies to facilitate and attract free flow of foreign investments.

The first and foremost as well as the most explicit impact of foreign investment lies in its capacity to maintain a favorable balance of payments (BOP)[4]. The import of the developing countries always weigh more and this leads to their chronic current account deficit (CAD) and unfavorable balance of payments. Hence financing these deficits is a major economic challenge faced by these countries. The inflow of foreign investments helps to fill the deficit of the current account. It is in this context that foreign investment is expected to

government bonds, corporate bonds, convertible securities, infrastructure securities etc. of another country. The class of investors who make investment in these securities are known as foreign portfolio investors. In India any single investor or investor group cannot exceed holding 10% of the equity of an Indian company, beyond which it will be treated as FDI.

[4]According to IMF, balance of payments of a country is a systematic record of all economic transactions between its residents and the residents of the rest of the world during a specified accounting period.

play decisive role in the economy of the host countries. That is why countries nowadays see foreign investment as a panacea for their balance of payment problem.

Like the balance of payments, foreign investment is destined to play a crucial role with regard to Foreign Exchange Reserves (FER)[5] as well. Accumulation of foreign exchange reserves takes place due to several reasons - foreign investments, consistent positive balance of trade, high export rate etc. and among these as can be seen later, foreign investment is the most prominent contributing factor in countries like India. A strong foreign exchange reserve, enables the nation to survive in the event of a sudden economic break down, prevents depreciation of domestic currency, regulates exchange rate and is the symbol of the financial health of a country. Thus, by contributing to the foreign exchange reserves, foreign investments have both a direct and indirect bearing upon the economy of the country.

Besides, countries which attract large capital inflows through foreign investments will witness an appreciation of its own domestic currency or Exchange Rate (ER)[6] as its demand rises and will be financially stronger than the other nations. Countries which have strong foreign exchange reserves tend to attract further foreign investments by the exhibition of its own financial strength. Just as a rich man's power transcends mere purchasing power and spreads to all other spheres of the society, foreign investment and the consequent non debt capital, have a positive impact on balance of payments, foreign exchange reserves, stability of exchange rate and the other aspects of the economy directly or indirectly. For example, foreign investment has an impact on the wholesale price index (WPI)[7] of the host country. The huge amount of foreign investment into the country creates a lot of demand for domestic currency and as a consequence the central bank is forced to issue more. This in its turn leads to excess liquidity in the market thereby leading to inflation.

[5] Foreign Exchange Reserves (FER) are the foreign currencies held by a country's central bank. They are also called foreign currency reserves or FX reserves.

[6] Exchange Rate (ER) is the price of one currency in terms of another currency. Since US dollar is the dominant currency of the world, generally exchange rate is linked with US dollar.

[7] Wholesale Price Index (WPI) is a price index which represents the wholesale price of a basket of goods over time. It is the proxy for measuring inflation (Base Year 2004-05).

Foreign investment has also the potential to influence the economic growth[8]. It can boost saving and investment of the host economy that leads to stimulate growth of the host countries. Developing countries suffer from the problem of low saving, low investment, and low growth. This low level cumulative causation can be broken only by supplementing domestic saving with foreign saving. A strong argument in favor of foreign investment is that foreign savings supplement domestic savings. Foreign investment helps to bridge the gap between domestic saving and domestic investment, that leads to accelerate economic growth. Higher saving steps up investment and economic growth. Promoting growth in a developing country like India it is necessary to augment the domestic savings. Foreign investment contributes to economic growth through an increase in productivity by providing new investments, better technologies and managerial skills to the host countries.

The policy makers all over the world accept that foreign investment enhances productivity of host countries. In developing countries which properly utilize foreign investment especially FDI, there is an increase in job opportunities, per capita income and in the GDP rate which ultimately results in higher standards of living. These benefits, together with its direct financing of capital, suggest that foreign investment has a very important place in modernizing the national economy and promoting economic development. FDI has become one of the effective methods of siphoning capital flows from the foreign sources. It turned out to be significant for the developing countries to reinforce their capital base. Various studies have proved that FDI inflows make a significant positive impact on economic growth of most of the developing economies. FDI also improves productivity, generates employment, expands export and transfers sophisticated technologies to the sectors and countries that require them the most.

The theories of modernization propose that the capital investment through FDI inflows in various sectors of an economy fosters economic growth. Countries that have well-developed financial system grow significantly from FDI inflows. Similarly the performance of Foreign Institutional Investors (FIIs), the domi-

[8]Index of Industrial Production (IIP) is usually used as a proxy for measuring growth rates in real sector. One of the main reasons why the IIP was considered to be a good proxy for GDP was that the value added by industrial production represented a substantial share of GDP. The growth in the index of industrial production indicates an escalation in the production of manufacturing goods such as mining, engineering goods etc. (Base Year 2004-05).

nant player of the FPI, leads to the rapid rise of the capital market and the consequent augmentation of the wealth of the investor. This positive wealth effect also often leads to higher consumption and greater demand for other asset classes such as gold, real estate etc. which, in turn, directly or indirectly fuels economic growth. Thus foreign investment can fill the savings investment gap and provide the foreign exchange to support growth and development. The contribution of foreign investment to growth can be direct through the financing of investment, which is invariably a source of growth, or indirect through an increase in consumption or absorption, which in turn will induce an increase in investment. The developmental impact is the greatest in the case of direct financing of investment.

Again, foreign investment can initiate some sort of a chain action in the host economy and can bring about a series of benefits to it. The inflow of foreign investment can provide capital to the developing countries i.e., non-debt creating source of capital. The increased inflow of foreign capital increases the allocative efficiency of capital of the host economy and can induce financial resources to flow from capital abundant countries to capital scarce countries. The flow of resources into the capital scarce countries reduces their cost of capital, increases investment, enhances the competitiveness of domestic enterprises and raises output. Some forms of foreign investment, such as venture capital, primary equity issues (on the domestic or international capital markets) and corporate bonds can make a valuable direct contribution to the financing of investment. Other forms of foreign investment such as purchases by foreigners of securities on domestic secondary markets, most of government bonds and derivatives have rather an impact on domestic wealth and absorption. This will increase consumption through two channels. First, the positive wealth effect generated by the increase in asset prices could encourage an increase in consumption by wealth holders. Secondly, portfolio asset purchases from residents increase bank liquidity and encourage a credit boom which can also increase investment through the accelerator effect. Besides, foreign investment especially FDI has played an important role in the process of globalization during the past two decades. The rapid expansion of FDI by multinational enterprises (MNEs) since the mid-eighties may be attributed to significant changes in technologies, liberalization of trade, investment regimes, and deregulation and privatization of markets in many countries including developing countries like India. Fresh investments, as well as mergers and acquisitions, (M& A) play an important role in the cross-country movement of FDI. Thus FDI plays an important role in the transmission of capital and technology across home and host countries.

Similarly FPI can impact the economy in certain unique ways. It is in and through the capital market that FPI plays its role in the general economy. Capital market is the backbone of an economy and foreign investment has the potential to influence tremendously the capital market. Thus capital market is the basement of the FPI from and through which the latter acts in the economy. In fact what the capital market gains or losses from FPI trickles down to the economy and spread all over it. Therefore an analysis of the role of the FPI in the capital market must be supplemented to clarify the impact of foreign investment on the economy as a whole.

Throughout the world FPI inflows and outflows have direct impact on the rise and fall of capital market indices of the host economy. It is argued that FPI, especially FIIs by increasing the trading volume, reduces the transaction costs and thereby improves market efficiency. It also imparts greater liquidity to the capital market. Introduction of foreign investment in the capital market necessitates and accompanies introduction of online trading system, derivative trading etc. which will further lead to the increase of liquidity and turnover in the capital market. Thus higher FPI flows create more wealth through higher asset prices. In other words when the FPI flows are high the market tends to rise rapidly, creating more wealth for the investor. These roles of FPI in the capital market and economy takes place in the following way.

The most important way foreign investment especially foreign portfolio investment affects the economy is through its various linkage effects via the domestic capital market. It is argued that the most important benefits from foreign investment in the capital market is that it gives an upward thrust to the domestic stock market prices. This has an impact on the price-earnings ratio (P.E. Ratio) of the firms. A higher P.E. Ratio leads to a lower cost of finance, which in turn can guide to a higher quantity of investment. The lower cost of capital and a booming share market can encourage new equity issues. FPI also has the virtue of stimulating the development of the domestic stock market. The catalyst for this development is competition from foreign financial institutions. This competition necessitates the importation of more sophisticated financial technology, adaptation of the technology to local environment and greater investment in information processing and financial services. The results are greater efficiencies in allocating capital, risk sharing and monitoring the issue of capital. This enhancement of efficiency due to internationalization makes the market more liquid, which leads to a lower cost of capital. The cost of foreign capital also tends to be lower, because the foreign portfolio can be more diversified across the national boundaries and therefore be more efficient in reducing country-specific risks, resulting in a lower risk premium. A well-developed stock market has its impact on the demand side also. It provides investors with an array of assets with varying degree of risk, return and liquidity. This increased choice of assets and the existence of a vibrant stock market provide investors with more liquidity and options, thereby inducing more savings. Increased competition from foreign financial institutions also paves the way for the derivatives market. All this, encourages more savings in equity related instruments. This, in turn, raises the domestic savings rate and improves capital formation.

FPI can also bring ancillary benefits through addition to the liquidity of domestic capital markets, thus favouring its development. It can also encourage the development of other financial intermediaries, thus strengthening the financial infrastructure and deepening the process of financial intermediation. FPI can also lead to more corporate governance, as more transparency and disclosure will be required from companies by foreign investors. Such developments on domestic capital markets can increase the amount of risk capital available for new enterprises. FPI can also bring non-financial benefits to the host economy by enhancing the business environment in which firms operate. All these point to the potential of the foreign investment to impact the host economy. The impacts wherever and whatever it may be, can be positive, negative or both. Same is the case with the impact of foreign investment on the economies of the host countries. The above said positive impacts of the foreign investments on the economy do not deny or ignore the negative and dangerous impact of foreign investment on the economies of the host countries. Excessive freedom to foreign capital may ultimately affect the economic sovereignty of the host countries. According to critics foreign investment especially FDI is selling sovereignty to multinationals. The East Asian Economic Crisis[9], as well as the happening in Russia and South American countries points out the dangers of unfettered freedom to import foreign capital. There are also fears that foreign firms might displace domestic monopolies, and replace these with foreign monopolies which may, in fact, create worse conditions for consumers. The critics of foreign investment not only refute the arguments in favor of foreign investment but also warn that foreign investment will cause more harm than good to the host economies.

History of foreign investments on several occasions have testified and justified the fears and criticisms levelled against foreign investments. One cannot approach the foreign investment without emphasizing its inherent risk like volatility, which has the potential to shatter the host economies. Foreign investment can be viewed as economic imperialism and modern version of capitalistic imperialism. One cannot deny that foreign investment is essentially private investment with the sole motive of profit and it will lead to the drainage of the wealth of the nations. The glorification of foreign investment raises two questions i.e., whether all the developed countries achieved development with the help of foreign investment and whether development of the underdeveloped countries without foreign investment is an unattainable dream.

1.1 Statement of the Problem

Opening of the doors of the Indian economy for foreign investment through liberalization and privatization was a turning point in the economic history of India. Though the economic condition of India during the last decades of the twentieth century was the compelling force behind her change of policy in

[9] South Korea, Philippines, Malaysia, Indonesia, Thailand, Singapore, Hong Kong and Taiwan came to be known as the Asian Tigers due to their sustained growth over a long period of time. The early part of the 1990s saw huge capital flows into these economies. These capital flows led to massive investment and high growth in the economies. Suddenly, by mid 1990s the macroeconomic fundamentals, particularly the current account of these economies began to deteriorate. The crisis began with the crash of the Thai Baht, which led to a currency crisis in the Tiger economies. By the end of 1997, Malaysian ringitt, the Indonesian rupiah, the Philippine peso and the Korean won lost between 44 and 56 per cent of their values against the American dollar.

relation to foreign investment flows, it led to a large surge of foreign investment in the Indian economy. Even a layman can notice that foreign investment has already saved the Indian economy from the imminent balance of payments crisis, improved foreign exchange reserves, stabilized exchange rate system, improved overall economic performance etc. Modernization of India's capital market, increase of stock prices, increase of knowledge flow, increase of market efficiency etc. are also noticeable since the advent of foreign investment in the capital market and that too without any visible dangers to the economy so far. In the light of the above observations, there are many who argue that foreign investment flows are favorable to the Indian economy. But several others, citing the example of East Asian experience, Global Financial crisis etc. argue that foreign investment flows are harmful to the economy in the long run.

Thus, there is a need to assess the overall impact of foreign investment on Indian economy by analysing the impact of foreign investment on the balance of payments, foreign exchange reserves, exchange rate, economic growth, capital market etc. to arrive at scientific conclusion whether foreign investment is favorable or harmful to the Indian economy. This analysis will help to examine whether there exist a relationship between foreign investment and the above variables. There is also a need to examine the comparative impacts of FDI and FPI on the Indian economy and which form of foreign investment - whether FDI or FPI is more conducive for the Indian economy.

1.2 Significance of the Study

Globally foreign investment is an ongoing phenomenon which touches and influences not only economy but also the whole political system of the country. This study attempts to evaluate foreign investment in India. Hence it has great significance not only for academicians but also for policy makers. This study also points out the pros and cons and the risks of foreign investment involved in India and proposes to point out some remedial measures to tide over such risks.

Similarly liberalization which began in 1991 and which paved the way for foreign investment in India, is a major policy shift in India which had been committed almost to a closed economy and socialistic pattern of society since independence. More than a quarter of the century - which is neither too short nor too long to make an assessment of foreign investment on an economy - has passed since India's large scale contact with foreign investment. Hence this study is timely and relevant. It is not denying that academic world is abound with researches and studies related to foreign investment in India. But comprehensive studies are few and far between. Majority of them, for the sake of specialization focuses on either one of the channels of foreign investments i.e., foreign direct investment or foreign portfolio investment. In order to get a comprehensive view of foreign investment, its two channels must be studied side by side giving due weightage to both because either FDI or FPI is not a true sample of foreign investment in India. Both are distinct in several ways for reasons well known. One who concentrates on FDI is likely to go unnoticed the volatility of foreign investment and may arrive at wrong conclusion related to foreign investment in India. Similarly another who concentrates on FPI is likely to give undue importance to the volatility of foreign investment and may come to wrong conclusions related to foreign investment in India ignoring foreign direct investment in India having more or less permanent nature. This is a strenuous attempt to cover the whole aspects of foreign investment i.e., Foreign Direct Investment and Foreign Portfolio Investment.

Apart from these, this study may have theoretical significance too. Economic underdevelopment is a chronic illness which the world faces today and economists strive to put forward certain growth models. Foreign investment, if found to have consistent, substantial and positive impact on the Indian economy, can lead to the development of a new growth model i.e., a growth model based on foreign investment.

1.3 Objectives of the Study

The present study "*Impact of Foreign Investment flows on Indian Economy in the Post Liberalization Era*" is undertaken with the following specific objectives:

- To analyze the structure, composition and trends of foreign investment in India.
- To identify the macroeconomic determinants of foreign investment in India.
- To examine the impact of foreign investment on the macroeconomic variables of Indian economy.
- To study the impact of foreign investment on the capital market of India with special reference to volatility.
- To make a comparison between the impact of foreign direct investment and foreign portfolio investment on the Indian economy.

1.4 Research Methodology

The crucial issue of this study as well as foreign investment in India is that whether the foreign investment flows has achieved the desired effect or not. Thus the crux of the problem of the study - as its title reveals - is the impact of foreign investment flows on the Indian economy. Hence the methodological issues involved in this study are how to study an economy and how to measure the impact of some phenomena like foreign investment on it. The first issue is attempted to resolve by studying the impact of foreign investment on the major macroeconomic variables of the Indian economy. Because the study of an economy is nothing other than the study of its macroeconomic variables as the former is essentially an entity emerged out of the totality of the later. These variables are used as some sort of checklist in relation to the impact of foreign investment and the universally accepted majority principle is followed to decide the impact of foreign investment on the Indian economy as a whole. That is if majority of the variables show positive impact of foreign investment it is inferred that the impact of foreign investment on Indian economy is positive and vice versa. It is true that the aforesaid approach must be followed only with ample caution because such an approach may prove correct only if all the macro economic variables are equals and deserve equal weightage which in fact is not the case. In other words here too the majority principle may not be infallibly true. For example even if majority of the variables show a positive impact of foreign investment and with regard to particular variable say for example, inflation, if the foreign investment is found highly adverse, it will not be fair to conclude that foreign investment has a positive impact on the Indian economy. On the contrary, if majority of the variables show positive impact and minority of the variables show only insignificant impact or moderately adverse impact it may be possible to conclude that foreign investment has a positive impact on Indian economy.

Then the problem, the second issue, arises how to study and measure the impact of foreign investment on the macroeconomic variables. This problem is resolved by examining, mainly with the help of econometric tools, whether there exist a relationship between foreign investment and the above variables on the assumption that existence of relationship implies existence of impact - positive or negative and the more strong the relationship, the more will be the impact. Accordingly if foreign investment shows positive or negative relation with the majority of the macroeconomic variables studied, it is assumed that the impact of foreign investment on Indian economy is positive or negative respectively unless the minority of the variables, as already mentioned, stand exceptionally apart.

1.4.1 Sources of Data

The period of the study covers twenty seven years from 1991-92 to 2017-2018 and the data required for the study is mainly collected from secondary sources. The data related to capital flows made by the FIIs, Global Depositary Receipt and American Depositary Receipt, Offshore Funds, FDI flows such as Equity Capital, Reinvested Earnings and Other Capital etc. are collected from RBI Bulletin, Handbook of Statistics on Indian Economy and Indian Securities Market Review. The data related to current account deficit, foreign exchange reserves, exchange rate, wholesale price index, and index of industrial production are gathered from the Reserve Bank of India Annual Report, Handbook of Statistics on the Indian Economy, Report on Currency and Finance and RBI Database. Data relating to foreign investment in the form of foreign direct investment, foreign portfolio investment, and debt flows are also taken from

RBI Database. In addition to these data, the data about the movement of BSE Sensex and Nifty indices, market capitalization, turnover ratio, P.E. Ratio etc. are collected from the Annual Report of SEBI.

1.4.2 Data Analysis

The analysis of the data is made with the help of descriptive and inferential statistics.

- Growth of foreign investment flows (FDI and FPI) is measured in terms of Compounded Annual Growth Rate (CAGR).
- The Augmented Dickey Fuller (ADF) Unit Root Test is used to verify the stationary properties of the macro economic variables in India.
- Auto Regressive Distributed Lag (ARDL) Model is used to determine the macroeconomic determinants of foreign investment in India and to analyse the impact of foreign institutional investment on stock return.
- Akaike Information Criteria (AIC) is used for determining the optimal lag length of the models.
- For measuring the stability of the ARDL Model, Cumulative Sum (CUSUM) Test is used.
- Johansen Co-integration Approach is used to determine the number of co-integration equations among the variables of the model.
- Vector Error Correction Model (VECM) is used to estimate the short run dynamics and long run impact of foreign investment on the macroeconomic performance of India.
- Error Correction Model (ECM) is used to verify short run dynamics with long-run equilibrium of the model.
- Variance Decomposition is used to explain the extent to which a variable is influenced by the shocks in all the variables in the system. The Forecast Error Variance Decomposition is used to explain the proportion of the

movements of macroeconomic variable (dependent variable) in a sequence due to its own shock versus shocks to the other macroeconomic variables (independent variables).

- The Impulse Response Function (IRF) is used to show the dynamic responses of all the variables in the system to a shock or innovation in each variable.
- Granger Causality Test is used to analyse the impact of foreign institutional investment on stock market development indicators.
- GARCH and ARCH Models are used to analyse foreign investment volatility.
- Statistical techniques such as Range, Standard Deviation, Skewness and Coefficient of Variation are used for making descriptive analysis of the data and to measure the volatility and other characteristics of the data series.

1.5 Organization of the Study

Chapter One: Introduction - deals with the theoretical framework of the potential of foreign investment to impact Indian economy. It also discusses the objectives, significance, research methodology and limitations of the study.

Chapter Two: Review of Literature - is devoted for the survey of the literature related to the area of study. Though watertight compartmentalization is not possible, the literature review is presented in two categories - studies related to foreign direct investment and studies related to foreign portfolio investment.

Chapter Three: Structure and Composition of Foreign Investment in India - is a cross section of the quantity and regulations of foreign investment in India since 1992.

Chapter Four: Determinants of Foreign Investment in India - mainly concentrates on the empirical analysis of the macroeconomic determinants of foreign investment in India using Auto Regressive Distributed Lag (ARDL) model.

Chapter Five: Impact of Foreign Investment on the Macroeconomic Variables of Indian Economy - analyses the impact of foreign investment on the Indian economy with special reference to the impact of foreign investment on its macroeconomic variables like balance of payments, foreign exchange reserves, exchange rate, economic growth, inflation, external debt etc. with the help of Vector Error Correction Model (VECM).

Chapter Six: Impact of Foreign Investment in the Indian Capital Market - is devoted for the analysis of the impact of foreign investment on Indian Economy through the capital market, the major domain of foreign investment in India with special reference to volatility.

Chapter Seven: Findings and Conclusion - comprises the consolidated and summarized findings with a formal conclusion having the nature of observations, criticisms, suggestions etc.

1.6 Limitations of the Study

The very nature of the subject, non-availability of data etc. impose certain limitations on this study. First of all this study is an attempt to examine some sort of cause effect relationship - foreign investment as cause and impact on the economy as effect. As the case of all other social sciences such an attempt cannot be carried out with full accuracy. Because economy is a complex system where different factors, internal as well as external, mutually influence and interact. Therefore it is not possible to isolate or single out one among them like foreign investment and attribute its exclusive impact on the economy. What is possible is to arrive at certain trends. In this sense this study cannot claim to be fully accurate.

Another limitation of the study is the non-employment of comparative method. Had comparisons of the impacts of foreign investment on different sectors, different periods (pre and post liberalization), between the intensity of the impact of FDI and FPI on Indian economy etc. were made this study could have produced more reasonable results.

Again since it is neither possible nor feasible to study the impact of foreign investment on all the variables and sectors of the Indian economy, only the flow of foreign investment and its impact to the economy as a whole is emphasized focusing on certain academically endorsed foreign investment sensitive variables and sectors of the economy. Yet the exclusion of sector wise analysis of the impact of foreign investment from the purview of this study remains to be its limitation.

Like manner, the absence of standardised data related to the foreign investment and macroeconomic variables might have limited the accuracy of the analysis in certain context especially in measuring the intensity of the impact of foreign investment.

Similarly the two main players of foreign investment i.e., FDI and FPI have varying and distinct characteristics like ownership, volatility etc. For reasons already pointed out separate analysis of the intensity of the impact of these different players on the economy could not be made. Instead it became necessary to content with the analysis of their combined or total impact on the economy. This too is a limitation of this study to a certain extent.

Chapter 2

Review of Literature

Capital has always been the pivot on which economies, economics and economists revolve. In fact Adam Smith's 'Wealth of Nations', is a treatise on capital where he gives great importance to capital by considering capital as one of the factors of production and examines the functions of capital in detail. The epoch making work of Karl Marx, 'The Das Capital' which examines the past, the present and the future dimensions of capital and capitalism, is prophetic in nature as he predicts the flow of capital beyond the national boundaries.

By the end of the 18^{th} century, as fortold by Marx, capital began to flow beyond the national boundaries as an integral part of colonialism. The colonial powers competed among themselves to make investments in their colonies. Such foreign investments, though may be the predecessor of the present day foreign investment, were entirely different from the present one as the receiving countries had no say in such investments. It was some sort of an imposed foreign investment made with the political and theoretical backup and justification. Several works appeared justifying such imposed foreign investment. The theme of them was the justification of foreign investment as an attempt to make the uncivilised world civilised Niti (2012)[10], Arockia and Soundararaj (2009)[11].

[10] Niti, B. (2012). *Foreign Direct Investment in India: Policies, Conditions and Procedure*. New Century Publication, New Delhi.

[11] Arockia B., and Soundararaj J.J. (2009). *The Impact of Foreign Direct Investment on Indian Economy*, Excel Publications, New Delhi.

When nationalism emerged throughout the world and colonialism began to be questioned and threatened, a lot of works appeared supporting nationalism, attacking foreign investment, emphasizing 'swadeshi movement'. By the middle of the 20^{th} century, criticism of foreign investment became the order of the day. Naoroji (1901)[12] was the prominent member of this school of thought. But in the latter half of the 20^{th} century with the advent of globalization and its corollaries, a series of works appeared justifying as well as opposing foreign investments. These works can be classified under the following heads as per the relevance of the study.

2.1 Studies Related to Foreign Direct Investment (FDI)

Within the field of foreign investment, when compared to Foreign Portfolio Investment (FPI) it is Foreign Direct Investment (FDI) which attracted more scholarly attention all over the world. Several researchers tried to explain the theory of FDI and came up with its different concepts. In 1966 Raymond Vernon proposed the production cycle theory in which he identifies four stages of production i.e., innovation, growth, maturity, and decline. According to him FDI occurs during the second stage i.e., growth phase, with the motive of ensuring market share abroad (Vernon, 1966)[13]. Nayak and Choudhury (2014)[14] put forward a new argument. According to them FDI will take place only in an imperfect market where monopoly and oligopoly exist. They argue that a perfect market is not conducive for FDI because of the presence of a large number of sellers and buyers, absence of government intervention etc. According to Denisia (2010)[15], the macroeconomic perspective on FDI is that FDI itself is a type of cross border capital flow between home and host countries, and is reflected in the balance of payments statement of countries.

[12] Naoroji, D. (1901). *Poverty and Un-British Rule in India.* Commonwealth Publishers. Ministry of Information and Broadcasting, Patiala.

[13] Vernon, R. (1966). International Investment and International Trade in the Product Cycle. *Quarterly Journal of Economics*, 80(2), 190-207.

[14] Nayak, D., and Choudhury, R. N. (2014). *A Selective Review of Foreign Direct Investment Theories, Asia - Pacific Research and Training Network on Trade.* ARTNET Working Paper Series, No. 143, Bangkok.

[15] Denisia, V. (2010). Foreign Direct Investment Theories: An Overview of the Main FDI Theories. *European Journal of Interdisciplinary Studies*, 2(2), 53-59.

Another macroeconomic theory identified in the study, carried out by Lipsey (2004)[16], is the dynamic macroeconomic FDI theory. According to this theory, the timing of foreign direct investments depends on the changes in the macroeconomic environment. The macroeconomic environment consists of gross domestic product, domestic investment, the real exchange rate, productivity and openness. According to him these are some of the factors that influence the FDI flows into a country. This theory further affirms that FDI is a long term function of multinational companies and duration of time plays an important role in this function. The timing of investment will depend on the macroeconomic environment that is the political environment, the inflation rate, exchange rate, interest rate, market size, government policies etc. at that particular period in the host country as well as its degree of openness, rate of economic development, risk perceptions etc. Therefore it is important for a foreign investor to analyze and understand the investment environment of a country, the risks associated with the investment environment, the effect of various variables etc. will be different in different countries and economic environments.

Another area of literature is related to the determinants of FDI. Chawla and Rohra (2015)[17] considered economic growth rate (GDP) of the host country as a crucial factor for attracting FDI. According to them GDP is an indication of a country's ability to produce and consume and acts as a factor to attract foreign investors. Several others are of the same opinion. Mottaleb and Kalirajan (2010)[18] studied a sample of 68 developing countries for a period extending from 2005-2007 and found that there is a positive relationship between market size and FDI. According to them market size of the host country is a very important factor for potential investors. Therefore they argue that GDP growth rate can be considered as the growth of market potential. A growing market would increase the prospects of market potential and a large market size would generate economies of scale. Nair-Reichert and Wienhold (2001)[19] mainly fo-

[16] Lipsey, R.E. (2004). Home-and Host-Country Effects of Foreign Direct Investment in Challenges to Globalization: Analysing the Economics, University of Chicago Press, 333-382.

[17] Chawla, K., and Rohra, N. (2015). Determinants of FDI: A Literature Review. *The International Journal of Business & Management*, 3(3), 227-250.

[18] Mottaleb, A. K., and Kalirajan K, (2010). Determinants of Foreign Direct Investment in Developing Countries: A Comparative Analysis. *The Journal of Applied Economic Research*, 4(4), 369-404.

[19] Nair-Reichert, U., and Wienhold, D. (2001). Causality Tests for Cross-Country Panels: A New Look at FDI and Economic Growth in Developing Countries. *Oxford Bulletin of Economics of Statistics*, 63(2), 153-171.

cused on the causality running from FDI to GDP. The two-way link between FDI and GDP indicates that increased FDI promotes growth in host countries, similarly brighter growth prospects in the host countries attract an increased flow of FDI. According to Ivohasina and Hamori (2005)[20] return on capital is the dominant determinant of FDI. It is after conducting research among a sample of developing countries over the period of 1980-2001, they put forward this argument. Their finding is that capital scarce countries attracted comparatively good quantity of FDI because of the chances of highest return on the capital.

Another set of scholars emphasize exchange rate as a determinant of FDI. Udomkerdmongkol et al. (2009)[21] examined the impact of exchange rate on 16 host countries by US foreign direct investment over the period of 1990-2002. Their argument is that devaluation of the host economies reduce the cost of investment in these countries and hence profitable for investors. Their findings show that exchange rate devaluation is positively associated with US FDI flows and attributed this relationship to the fact that devaluation lowers the cost of investment in host countries for US foreign investors. At the same time according to Banga (2003)[22] volatility of exchange rate adversely affects the foreign direct investment. High volatility of exchange rate indicates uncertainty regarding the future economic and business aspects of the host country. Ellahi (2011)[23] also examined the behaviour of foreign direct investment flows in relation to the volatility of exchange rate and support the above view i.e., exchange rate volatility has negative effect on FDI flows.

Drake and Caves (1992)[24] found that fluctuations of exchange rate have an adverse impact on FDI. According to them the fluctuation of exchange rate is an indication of the instability of the currency of a country. However

[20] Ivohasina, R., and Hamori, S. (2005). An Empirical Analysis of FDI Competitiveness in Sub-Saharan Africa and Developing Countries. *Economics Bulletin*, 6(20), 1-8.

[21] Udomkerdmongkol, M., Morrissey, O., and Gorg, H. (2009). Exchange Rates and Outward Foreign Direct Investment: US FDI in Emerging Economies. *Review of Development Economics*, 13(4), 754-764.

[22] Banga, R. (2003). *Impact of Government Policies and Investment Agreements on FDI inflows*, Working Paper, No.116, Indian Council for Research on International Economic Relations, New Delhi.

[23] Ellahi, N. (2011). Exchange Rate Volatility and Foreign Direct Investment Behaviour in Pakistan: A Time Series Analysis with Auto Regressive Distributed Lag Application. *African Journal of Business Management*, 5(29), 116-125.

[24] Drake, T.A., and Caves, R.E. (1992). Changing Determinants of Japanese Direct Investment in the United States. *Journal of Japanese and International Economics*, 6(1), 228-246.

it is not an absolute condition; the influence of exchange rate upon the FDI depends on the quantity of the export of the country and the motives of the investment. They conclude that exchange rate uncertainty tends to delay the FDI activity of a market-seeking firm and it may accelerate the FDI activity of an export-substituting firm if the degree of risk aversion of the firm is high enough. Therefore, the results reveal that the relationship between exchange rate uncertainty and FDI crucially depends on the motives of the investing firms. Lower exchange rate in the host country means higher purchasing power of investing country's currency in the host country. Nyarko et al. (2011)[25] investigated the effect of exchange rate regime on FDI in Ghana over the period 1970-2008 and found an insignificant relationship between FDI and exchange rate. According to them it is because of the efforts of the policy makers in Ghana to stabilise the exchange rate as tool for attracting FDI.

The role of inflation of the host countries in attracting FDI is also studied by some writers. Ahn et al. (1998)[26] argued that there is a negative relation between FDI and inflation. Their argument is that higher rate of inflation is an indication of poor economic management or poor macroeconomic policies, which will repel foreign investors. Studies made by Frenkel et al. (2004)[27] and Mohamed et al. (2010)[28] agree with this finding. According to them high rate of inflation discourages FDI because high rate of inflation indicates some potential economic risks like deterioration of the real value of investment, return on investment etc. and thus discourage investments. According to Wheeler and Mody (1992)[29] economic stability of host country is a decisive factor in attracting FDI and there is negative relationship between foreign direct investment and inflation. It follows that low inflation of the host country is a necessary condition to promote FDI.

[25] Nyarko, P.A., Nketiah-Amponsah, E., and Barnor, C. (2011). Effects of Exchange Rate Regimes on FDI Inflows in Ghana. *International Journal of Economics and Finance*, 3(3), 277-286.

[26] Ahn, Y.S., Adji, S.S., and Willett, T.D. (1998). The Effects of Inflation and Exchange rate Policies on Direct Investment to Developing Countries. *International Economic Journal*, 12(1), 95-104.

[27] Frenkel, M., Funke, K., and Stadtmann, G.(2004). A Panel Analysis of Bilateral FDI Flows to Emerging Economies. *Economic Systems*. 2(2). 281-300.

[28] Mohamed, S. E., and Sidiropoulos, M.G. (2010). Another Look at the Determinants of Foreign Direct Investment in MENA Countries: An Empirical Investigation. *Journal of Economic Development*, 35(2), 75-95.

[29] Wheeler, D., and Mody, A. (1992). International Investment Location Decisions. The Case of US Firms. *Journal of International Economics*, 33(1-2), 57-76.

There are some studies which point out the influence of trade policies especially free trade and trade volume of the host countries on the FDI flows. A significant positive relationship of FDI with international trade volume has been found in the studies of Asiedu, (2002)[30] and Gastanga et al. (1998)[31]. Baharom et al. (2008)[32] studied the relationship between trade openness and FDI in influencing the economic growth of Malaysia using the Bounds Testing Approach. They found that there is positive relationship between FDI and trade openness which in turn encourages the economic growth. According to them the more the trade openness the more will be the FDI flows to the host countries and their economic growth. Trade openness also plays major role in pulling FDI into a country. Scaperlanda (1992)[33] also pointed out that the relationship between trade openness and FDI is positive. Ekpo (1995)[34] examined the factors like higher profit from investment, low labour and production cost, political stability, enduring investment climate, functional infrastructure facilities and constructive regulatory atmosphere and argue that these factors help to attract and preserve FDI in the host country.

Foreign direct investment has a significant positive impact on economic growth of developing countries but the magnitude of the impact is dependent on the conditions and characteristics of the host country (Bengoa and Sanchez-Robes 2003)[35]. Tiwari and Mutasque (2011)[36] scrutinized the relationship between FDI and GDP of Asian countries by using Panel Data Approach of 23 countries for the time period of 1986-2008. The results of study show that FDI and export have significant impact on the growth of economy. Jayachandran (2012)[37] investigated the relationship among trade, foreign direct investment

[30]Asiedu, E. (2002). On the Determinants of Foreign Direct Investment of Developing Counties: Is Africa Different?. *World Development*, 30(1), 107-119.

[31]Gastanaga,V. M., Jeffrey, B. N., and Pashamova, B. (1998). Host Country Reforms and FDI Inflows: How Much Difference Do They Make?. *World Development*, 26(7), 1299-1314.

[32]Baharom, A. H., Muzafar Shah, H., and Royfaizal, R. C. (2008). *The Relationship between Trade Openness, Foreign Direct Investment and Growth: Case of Malaysia*, MPRA Paper No. 11928, University Library of Munich, Germany.

[33]Scaperlanda, A. (1992). Direct Investment Controls and International Equilibrium: The US Experience. *Eastern Economic Journal*, 18(2), 157-170.

[34]Ekpo, A.H. (1995). Foreign Direct Investment in Nigeria: Evidence from Time Series Data. *CBN Economic and Financial Review*, 35(1), 59-78.

[35]Bengoa, M., and Sanchez-Robles, B. (2003). Foreign Direct Investment, Economic Freedom and Growth: New Evidence from Latin America. *European Journal of Political Economy*, 19(3), 529-545.

[36]Tiwari, A. K., and Mutascu, M. (2011). Economic Growth and FDI in Asia: A Panel Data Approach. *Economic Analysis and Policy*, 41(2), 173-188.

[37]Jayachandran, G. (2012). FDI, Trade and Economic Growth in Singapore-Evidence from Time-Series

and gross domestic product of Singapore during 1970- 2010. This study reveals a general positive co-relationship among trade, foreign direct investment and economic growth.

There are some other scholars who accept the impact of FDI on economic growth conditionally. Marta and Robles (2002)[38] studied the relationship of FDI and economic growth using the data of 18 Latin American countries for the period of 1970-1999 using Panel Data Approach. According to them if the size of the market of the host countries is sufficiently large, has developed human capital and economic stability, there is a positive relationship between FDI and economic growth of host country. In their article "Impact of Foreign Direct Investment on Economic Growth in Pakistan" Younus et al. (2014)[39], argued that there is a positive relation between economic growth and FDI. Their study was conducted using Two Stage Least Squares Method of Simultaneous Equations Estimation by taking GDP and FDI. Their study also found that the major determinants of FDI are the export size, domestic investment and political stability of the host countries. They recommended that governments of the host countries should frame suitable policies to attract FDI. Zhang (2001)[40] using econometric techniques such as Co-integration Tests and Error Correction Mechanism analyses the data from 11 countries in East Asia and Latin America and argues that FDI promotes economic growth only in countries with a liberalized trade regime and a work force with higher job skills and education.

Similarly, Hermes and Lensink (2003)[41] argue that improvement of the financial structure of the host economy is a pre-condition for the boosting of the economic growth by the FDI. Out of the sixty seven countries studied FDI made positive contribution only in the case of thirty seven countries. According to them these thirty seven countries could achieve economic growth mainly because of their developed financial structure. Therefore they suggest the im-

Causality Analyses. *Journal of Research in Commerce*, IT & Management, 2(9), 66-70.

[38]Marta, B., and Robles, B. (2003). Foreign Direct Investment, Economic Freedom and Growth: New Evidence from Latin America. *European Journal of Political Economy*, 19(4), 529-545.

[39]Younus, H., Amir,S., and Azeem, M. (2014). Impact of Foreign Direct Investment on Economic Growth in Pakistan. *World Journal of Economic and Finance*, 1(1), 002-005.

[40]Zhang, K.H (2001). Does Foreign Direct Investment Promote Economic Growth? Evidence from East Asia and Latin America. *Contemporary Economic Policy*, 19(2), 175-85.

[41]Hermes, N., and Lensink, R. (2003). Foreign Direct Investment, Financial Development and Economic Growth. *The Journal of Development Studies*, 40(1), 142-163.

provement of the domestic financial structure of the host economies before permitting FDI.

Baharumshah and Thanoon (2006)[42] by using Dynamic Panel Models demonstrated the positive contribution of FDI on the growth process of East Asian economies. Atique et al. (2004)[43] evaluated the economic growth of Pakistan using Eangle Granger and Hansen Methods. They found that the impact of FDI on the economy is higher than the impact of export of the economy and come to the conclusion that FDI played a significant role in the economic growth of Pakistan.

Yousaf et al, (2008)[44] studied the impact of FDI on Pakistan economy using Error Correction Model and Co-integration Techniques. Gudaro et al. (2010)[45] also studied the impact of FDI on the economic growth of Pakistan covering the data for the period of 1981-2010. They consider GDP as a dependent variable while FDI and CPI as independent variables. Their finding using Regression Model is that the relationship between these variables is significant and there is a positive effect of FDI on economic growth and negative relationship between inflation and GDP. Abbas et al. (2011)[46] examined the impact of FDI on the economic growth of the SAARC countries employing Multiple Regression Models and taking GDP as a dependent variable and FDI and inflation as independent variables. They found that while there is a positive and significant relation between GDP and FDI, there is only insignificant relation between GDP and inflation. According to them GDP of the host country is reflected in its purchasing power and its market size is the most important factor which attract FDI. Scaperlanda and Maurer (1969)[47] studying the economies of the several developing host countries argue that there is a positive relation between market size and FDI.

[42]Baharumshah, A.,and Thanoon, M. (2006). Foreign Capital Flows and Economic Growth in East Asian Countries. *China Economic Review*, 17(1), 70-83.

[43]Atique, Z., Ahmad, M. H,. and Azhae, U. (2004). The Impact of FDI on Economic Growth under Foreign Trade Regimes: A Case Study of Pakistan. *The Pakistan Development Review*, 43 (4), 707-718.

[44]Yousaf, M. M., Hussain, Z., and Ahmad, N. (2008). Economic Evaluation of Foreign Direct Investment in Pakistan. *Pakistan Economic and Social Review*, 46(1), 37-56.

[45]Gudaro, A. M., Chhapra, I. U., and Sheik, S. A. (2010). Impact of Foreign Direct Investment on Economic Growth: A Case Study of Pakistan. *Journal of Management and Social Sciences*, 6(2), 84-92.

[46]Abbas, Q., Akbar, S., Nasir, A., Amanullah, H., and Naseem, M. (2011). Impact of Foreign Direct Investment. *Global Journal of Management and Business Research*, 11(8), 143-157.

[47]Scaperlanda, A., and Maurer, L. (1969). The Determinants of US Direct Investment in the EEC. *American Economic Review*, 59(2), 558-568.

In their study Nair-Reichert and Wienhold (2001)[48] besides establishing the relationship between FDI and GDP argue that there is a two way relationship between GDP and FDI. i.e., on the one side increase in FDI promotes growth of the host countries and on the other side increase in the growth of the host countries attract more FDI. Stehrer and Woerz (2009)[49] examine the effect of FDI on the output growth of the host country by selecting OECD and non-OECD countries are sample for the period 1981-2000. The results suggest a positive relationship between FDI and output growth as well as productivity and export. Another area related to the impact of FDI is the foreign trade. One main study in this area was conducted by Qayyum and Mehmood (2013)[50]. From their study on Pakistan economy they find that there is a mutual relationship between FDI and foreign trade i.e., they are of the opinion that FDI promotes foreign trade.

FDI in India also received serious attention from the scholars. It may be because of the drastic policy deviation. Though the Nehru Resolution of 1949 permitted FDI under certain severe restrictions, generally India was strictly against foreign investment before liberalization. But as mentioned earlier it was the economic reforms in the 1990s which paved the way for FDI in India. These reforms not only lifted the restrictions imposed by Nehru Resolution but also framed policies in favour of FDI. In fact it was certain theoretical works which prepared India for economic reforms and foreign investment. One such work was by Sharma (1987)[51]. He presents a case for a new foreign investment statute in India. The study argues that since foreign direct investment has to be encouraged and regulated, it is necessary to have a positive investment climate. The foreign investor should be clear in which field his investment is welcome; what the criteria for allowing foreign investment are; which is the proper regulatory agency and what are their powers; the time frame in which the project will be accepted or rejected and the penalties for the violation of laws

[48]Nair-Reichert, U., and Wienhold, D. (2001). Causality Tests for Cross-Country Panels: A New Look at FDI and Economic Growth in Developing Countries. *Oxford Bulletin of Economics of Statistics*, 63(2), 153-171.

[49]Stehrer, R., and Woerz, J. (2009). Attract FDI - A Universal Golden Rule? Empirical Evidence for OECD and Selected non-OECD Countries. *European Journal of Development Research*, 21(1), 95-111.

[50]Qayyum, U., and Mahmood, Z. (2013). *Inter-linkage between Foreign Direct Investment and Foreign Trade in Pakistan: Are They Complements or Substitute?*. Working Papers No. 91. Pakistan Institute of Development Economics Islamabad, Pakistan.

[51]Sharma, K. A. (1987). Case for a New Investment Statute. *Foreign Trade Review*, 22(1) 83-94.

dealing with foreign investment etc. It also recommends simple and streamlined procedures, clarity, comprehensiveness and promptness etc. to create a positive investment climate. According to him these objectives can be achieved through a new investment law dealing with all the above issues, which at present lie scattered in different statutes, regulations, circulars and guidelines.

Similarly Ghoshal (1990)[52] noticed some of the draw backs of India's FDI policy. According to him emphasise on indigenisation of industries, procedural delays and complications etc. of FDI policy repel large scale foreign investment in India despite policy relaxation allowing foreign investment. However he emphasises the need for foreign investment in India and advanced technology for economic growth and modernisation of the Indian economy. Bhattacharya (1994)[53] also supported the view of Ghoshal to a certain extent. According to him FDI policy of India cannot be the major or the only deciding factor in foreign investment. He gave equal importance to the availability of reliable knowledge and information about the business climate of India. According to him this is necessary because till recently India was known as a foreign investment opposing country. In other words government should give enough propaganda about the policy changes and the potential of Indian market. He also emphasises the need to achieve stability in the political and economic system as a prelude to foreign investment in India.

Prasad (1994)[54] also supported the above views. According to him along with liberalization policy, discriminative incentives for investment in the desired sectors by desired countries should be given. In his opinion liberalization must be an ongoing process and the critics of foreign investment can be silenced by the proper utilization of foreign investment, especially by acquiring new technology, by strengthening the domestic companies etc. Mani and Baker (1997)[55] made a SWOT analysis FDI and Indian economy. They argued that India's climate, an almost developed stock market, developed financial system, well developed infrastructure, qualified manpower, a vast market for consumer goods etc. are

[52] Ghoshal, M.K. (1990). Foreign Investment in India: Policy Lessons and Prospects, *Yojana*, 34(8), 17-19.

[53] Bhattacharya, B. (1994). Foreign Direct Investment in India. *Foreign Trade Review*, 28(4), 307-329.

[54] Prasad, A.C. (1994). Foreign Direct Investment in India: Some Basic Facts and Issues. *Foreign Trade Review*, 28(4), 307-329.

[55] Mani, U. H., and Baker J.C. (1997). Foreign Direct Investment in India: Problems and Prospects. *Foreign Trade Review*, 32(1), 16-28.

the strength of the Indian economy to receive and accept FDI. At the same time India's bureaucracy, delay in decision making, strong criticisms against multinational companies etc. are the unfavourable conditions of FDI in India.

Naga Raj (2003)[56] in his article presented the trends in FDI in India. He also compared FDI inflow in India with that of China. Based on the result of this descriptive analysis and comparative study, he suggests that a more realistic foreign investment policy framework is required to expect increased flow of FDI into India. Bajpai and Jeffrey (2006)[57] identified the issues and problems associated with India's FDI regimes in their paper on "Foreign Direct Investment in India: Issues and Problems". They observed that despite the favourable factors there are some unfavourable factors like restricted FDI regime, high import tariffs, exit barriers for firms, stringent labour laws, poor quality infrastructure, centralized decision making processes and a very limited scale of export processing zones etc. which deter free flow of FDI into India.

Sahni (2009)[58] argues that since FDI plays a major role in the economic growth of the developing countries it is very necessary for the emerging markets like India to frame policies to attract FDI. This paper also studied the trend of FDI in India and sector-wise economic reforms. The study of Mathur (2001)[59] provides a comprehensive view of the changes in India's foreign trade policy during the post liberalisation period from 1991-2001.The first part of this study examines the trade policy system during the pre-liberalisation period and the balance of payment crisis in India during that period. The study also presents a sectoral analysis of foreign investment and specifically highlights the foreign investment opportunities in the promising sectors of Indian economy like power, oil and natural gas, infra-structure, telecommunication etc. Bodla and Bhati (2004)[60] also observes the major changes taking place in the FDI in India. They observe the gradual decline of US monopoly in India and the advent of several developed western FDI into India. This study also no-

[56]Nagaraj, R. (2003). Foreign Direct Investment in India in the 1990s: Trends and Issues. *Economic and Political Weekly*, 38 (17), 1701-1712.

[57]Bajpai, N., and Jeffrey, D.S. (2006). *Foreign Direct Investment in India: Issues and Problems.* Paper No. 759, Harvard Institute of International Development, Development Discussion Cambrige.

[58]Sahni, P. (2012). Trends and Determinants of Foreign Direct Investment in India: An Empirical Investigation. *International Journal of Marketing and Technology*, 2(8), 144-161.

[59]Mathur, V. (2001), *Trade Liberalisation and Foreign Direct Investment in India 1991-2000.* New Century Publications, New Delhi.

[60]Bodla. B.S, and Bhati, U. (2004). FDI: Emerging Scenario. *Yojna*, 48(4), 21-27.

ticed the difference between FDI approvals and the actual realization, uneven distribution of FDI in the different states of India etc. citing the example of Maharashtra which received 19 percent of total FDI and Bihar and Himachal Pradesh which received the least, just 0.29 percent and 0.45 percent of the total FDI approved. This study also analysed sector wise break-up of FDI and technical collaboration approved. It showed that energy sector is on the top with 26 percent of total FDI approved, the telecommunication sector with 19 percent, and electric equipment with 9.33 percent come next. Kumar (1998)[61] examined the trends in FDI inflows to India in the wake of policy reforms initiated since 1991 and confirmed the magnitude of FDI inflows has recorded an impressive growth. The policy reforms have enabled the country to widen the sectoral as well as the source country composition of FDI inflows.

Unlike the above scholars Majumdar and Chhibber (1998)[62] made some sort of an evaluative study. By taking around 1000 firms with foreign investment during the period from 1999-2004, they find that the impact of FDI in these firms is not uniform with regarding their export performance. They observe that the higher the degree of foreign control and ownership, the higher will be the export performance. It follows that foreign firms wishing to enlarge their global market must invest in India in such a way that they will get control over the firm. They also suggest that in order to get the full benefit of FDI full foreign control over firms should be permitted.

Srivastava (2003)[63] explored a new aspect of FDI i.e. difference in the definition of FDI and interpretations. In this attempt he tried to prove that India is not an under performer when compared to China and Asia as usually projected. According to him there are some differences in the definition of FDI and the interpretation of FDI data. The definition of FDI and computation of FDI statistics used by RBI does not conform to the guidelines of the International Monetary Fund (IMF). There are discrepancies like exclusion of reinvested earnings while estimating actual FDI, but according to IMF

[61] Kumar, N. (1998). Liberalisation and Changing Patterns of Foreign Direct Investments: Has India's Relative Attractiveness as a Host of FDI Improved?. *Economic and Political Weekly*, 33(22), 1321-1327.

[62] Majundar, S. K., and Chibber, P. (1998). Are Liberal Foreign Investment Good For India?. *Economic and Political Weekly*, 34(22), 267-270.

[63] Srivastava, S. (2003). What is True Level of FDI Flows to India. *Economic and Political Weekly*, 38(7), 608-610.

guidelines these reinvested earnings are the part of FDI inflows and should be recorded as inflow on the capital account of host country's balance of payments. Secondly, India does not include the proceeds on foreign equity listings and foreign subordinated loans to domestic subsidiaries in FDI while IMF guidelines include them as part of FDI. These discrepancies make FDI data for India uncomparable to those countries which follow IMF Guidelines for the calculation of FDI.

Akhtar (2013)[64] stated in his study on "Inflows of FDI in India: Pre and Post Reform Period" that during pre-liberalization period FDI has increased at compounded annual growth rate of 19.05% and during post liberalization period it has grown to 24.28%. This shows that liberalization has had a positive impact on FDI inflows in India and since 1991 FDI inflows in India has increased approximately by more than 165 times. Nag and Ray (2004)[65] also admitted that FDI inflows into India is the aftermath of economic reforms. This study pointed out the huge amount of FDI inflows failed to contribute to substantial percentage growth of GDP when compared to selected South-East Asian host countries. According to the authors the main reason for the poor contribution of FDI to GDP is mainly because of the concentration FDI in India in the service sector.

Devajit (2012)[66] in his study, "Impact of Foreign Direct Investment on Indian Economy", besides analysing the impact of foreign direct investment on Indian economy advocates the need of foreign investment in India for her sustained economic growth, creation of employment opportunities, expansion of industries and various other projects related to education, health, research and development etc. Tsai (1994)[67] studied the impact of FDI on GDP, Export and productivity. He studies the major sectors with the help of Panel Co-integration Test. He also points out the concentration of FDI into a few sectors and development of these sectors as a result of FDI. The results also indicate that

[64] Akhtar, G. (2013). Inflows of FDI in India: Pre and Post Reform Period. *International Journal of Humanities and Social Science Invention*, 2(2), 1-11.

[65] Nag, B., and Ray, P. (2004). Experience of Financial Sector Reform in India: A Comparison with Select South East Asian Countries. *Foreign Trade Review*, 38(3), 38-63.

[66] Devajit, M. (2012). Impact of Foreign Direct Investment on Indian Economy. *Research Journal of Management Sciences*, 1(2), 29-31.

[67] Tsai, P.L. (1994). Determinants of Foreign Direct Investment and Its Impact on Economic Growth. *Journal of Economic Development*, 19(1), 137-163.

FDI has a negative relationship with export in three sectors namely transport, chemicals and food processing. The only sector in India that has enjoyed a positive relation between export and FDI is drugs and pharmaceuticals but that may also be due to the multiplicity of Greenfield projects in this sector which have expanded their exports through overseas affiliations by the parent companies. As far as Co-integrating relation between FDI and labour productivity is concerned the study shows that two sectors - transport and metallurgical, have positive relation whereas the other two sectors - food processing and industrial machinery have a negative co-integrating relationship. This means that when there is an increase in the output, export or labour productivity of the sector, it cannot necessarily be attributed to the advent of FDI. One of the important findings of this study is that FDI has failed to make a deep impact on the Indian economy at the sectoral level. It could therefore, be concluded that the advent of FDI has not benefited the Indian economy in a big way at sectoral level.

Resende (2010)[68] pointed out the determining factors of FDI in India. His paper provided an empirical analysis of domestic determinants of FDI such as size of the market, openness to trade, infrastructure, attractiveness to domestic market and exchange rate. In addition, the study includes technology growth as specific variable to examine local determinants of FDI in India. He advocates the expansion of FDI to the agricultural sector, the major component of county's GDP. Hooda (2011)[69] found that foreign direct investment is a vital and significant factor influencing the level of growth in Indian economy. She also estimated the determinants of FDI inflows and found that trade, GDP, research and development, financial position, exchange rate are the important macroeconomic determinants of FDI inflows in India. Singh (2009)[70] highlighted the significant role of FDI in the growth of developing countries like India and the need of FDI friendly policies in such countries. He also studied the trend of FDI since the economic reforms. According to Basu et al. (2007)[71] R& D ac-

[68]Resende Jr. Carlos, (2010). *Determinants of Foreign Direct Investment in an Emerging Market Economy: Evidence from India*, Bryant University.

[69]Sapna, H. (2011). *A Study of FDI and Indian Economy.* PhD Thesis, National institute of Technology, Kurukshetra, Haryana.

[70]Singh, S. (2009). *Foreign Direct Investment and Growth of States of India. Vision 2020 - Managerial Strategies and Challenge*, Wisdom Publications, Delhi.

[71]Basu, P., Nayak, N.C., and Archana, V. (2007). Foreign Direct Investment in India: Emerging Horizon. *Indian Economic Review*, 42(2), 255-266.

tivity is a significant determining factor for FDI in most of the industries in India. According to him the FDI attraction of software industry is because of intensive R& D activity there. In their opinion corporate tax adversely affects FDI flows.

Agrawal et al. (2011)[72] made a comparative study of the role of FDI in the economic growth of China and India during 1993-2009 using a Modified Growth Model and investigated the effect of FDI on economic growth of China and India. The factors included in the Growth Model were GDP, human capital, labour force, FDI and gross capital formation. On the basis of OLS Method of Regression they found that China's growth is more affected by FDI than India's growth. The majority of the foreign investors prefer China to India for investment because China has a bigger market size than India, better government incentives, developed infrastructure, cost - effectiveness, easy accessibility to export market and favourable macro-economic climate. Iqbal et al. (2013)[73] also studied the impact of FDI on the economic growth of India and China. They compared India and China in attracting FDI and benefiting out of FDI. According to them with regards to the growth of both countries FDI plays a positive role i.e., FDI contributed to the GDP growth and increase of the per capita income of both India and China. However China attracts more FDI than India thanks to her infrastructure facility, business environment etc.

A similar study was made by Gwartney (2010)[74] comparing the role of FDI in the economic growth of Bangladesh, India, Pakistan and Sri Lanka. He used Simple Log Linear Regression Model. He found that FDI along with exports played statistically significant role in the economic growth of these countries and hence he advocated that they should encourage exports and FDI to accelerate their further economic growth. Anitha (2012)[75] projected of FDI inflows into India from 2010-15 using Autoregressive Integrated Moving Average (ARIMA) forecasting techniques. She also identified the factors which prevent

[72] Agrawal, G., and Khan, M. A. (2011). Impact of FDI on GDP: A Comparative Study of China and India. *International Journal of Business and Management*, 6(10), 71-79.

[73] Zafar, L., Imran, M., and Ramzan, M. (2013). Foreign Direct Investment and Economic Growth: Comparative Position of Chinese and Indian Economies. *Journal of Business Studies*, 4(3), 52-61.

[74] Gwartney, J. (2010). Institutions, Economic Freedom, and Cross-Country Differences in Performance. *Southern Economic Journal*, 75(4), 937-956.

[75] Anitha, R. (2012). Foreign Direct Investment and Economic Growth in India. *International Journal of Marketing, Financial Services and Management Research*, 1(8), 108-125.

FDI and suggested innovative policies and good corporate governance to attract more FDI to India. Gaurav (2010)[76] found out in his study that foreign direct investment has a major role to play in the economic development of the host countries including India. He observed that most of the countries have been using foreign investment and foreign technology to accelerate the pace of their economic growth. According to him since FDI ensures a huge amount of non-debt capital, production level and employment opportunities in the developing countries, it is a major step towards the economic growth of India.

There are also several writers who strongly criticise FDI in general and FDI in India in particular. Bevan et al. (2004)[77] studying the relationship between FDI and economic growth of Turkey argues that FDI has no role in the economic growth of Turkey in the short run or long run. From his study based on the impact of FDI on the economic growth of Pakistan, Falki (2009)[78] observed a downward trend of FDI during the economic growth of Pakistan from 1980-2006 and concluded that FDI has no significant role in the economic growth of Pakistan during that period. Another large scale study selecting 72 countries by Carcovic and Levin (2000)[79] using Ordinary Least Square method also did not see considerable FDI influence in the economic growth of these countries they selected for the study. But it must be remembered that the period selected for the study was 1960-1995 when FDI was in its infant stage. FDI became full-fledged only since globalization.

Again in his study on the effect of FDI on the economic growth of Malaysia using GARCH and Causality Approach Duasa (2007)[80] also did not see any causal relationship between the economic growth of Malaysia and the FDI flow to there and hence conclude that there is no causal relationship between economic growth and FDI. Kim and Seo (2003)[81] have a similar finding in their

[76]Gaurav, A. (2011). Impact of FDI on GDP: A Comparative Study of China and India. *International Journal of Business and Management*, 6(10), 132-140.

[77]Bevan, A., Estrin, S., and Meyer, K. (2004). Foreign Investment Location and Institutional Development in Transition Economies. *International Business Review*, 13(1), 43-64.

[78]Falki, N. (2009). Impact of Foreign Direct Investment on Economic Growth in Pakistan. *International Review of Business Research Papers*, 5(5), 110-120.

[79]Carkovic, M., and Levine, R. (2000). *Does Foreign Direct Investment Accelerate Economic Growth?*. University of Minnesota, Working Paper.

[80]Duasa, J. (2007). Malaysian Foreign Direct Investment and Growth: Does Stability Matters. *Journal of Economic Co-operation*, 28 (2), 83-98.

[81]Kim, D.D., and Seo, J.S. (2003). Does FDI Inflow Crowd Out Domestic Investment in Korea. *Journal of Economic Studies,* 30 (6), 605-22.

study using Vector Auto Regression Models on the role of FDI on the economic growth and domestic investment in Korea for the period of 1959-1999. According to them though FDI has some impact on the economic growth of Korea it is insignificant. The also found that FDI made no significant role to boost the domestic investment in Korea.

There are also writers like Mathiyazhagan (2005)[82] who see no considerable impact of FDI on the economic growth of India. He argues that at the sectoral level of the Indian economy FDI failed to produce positive impact. Instead of FDI he suggests the opening of export oriented sectors for achieving higher growth of the economy through the growth of these sectors. Chakraborty and Nunnenkamp (2006)[83] also pointed out similar defect of FDI in India i.e., neglect of primary sector and over emphasise of manufacturing sector. They also pointed out despite the concentration of FDI on the service sector, it fail to produce proportionate result in this sector. They advocate further relaxations and opening of more industries to the FDI. According to Ahmad and Hamdani (2003)[84] in the economic growth of Pakistan, the role of domestic private investment is more significant than FDI. In their opinion the repatriation of FDI profit will adversely affect the economic growth of the host economies. Nonnemberg et al. (2004)[85] refute the argument that there is two way relationship between FDI and economic growth. According to them though economic growth attracts more FDI, FDI does not contribute to the economic growth.

[82]Mathiyazhagan, K.M. (2005). *Impact of Foreign Direct Investment on Indian Economy: A Sectoral Level Analysis*. ISAS Working Paper, Institute of South Asian Studies Singapore.

[83]Chakraborty, C. and Nunnenkamp, P., (2008). Economic Reforms. FDI and Economic Growth in India: A Sector Level Analysis. *World Development*, 36(7), 1192-1212.

[84]Ahmad, E., and Hamdani, A. (2003).T he Role of Foreign Direct Investment in Economic Growth. *Pakistan Economic and Social Review*, XLI (1 & 2), 29-43.

[85]Nonnenberg, M., and Mendonca, M. (2004). The Determinants of Direct Foreign Investment in Developing Countries. Proceedings of the 32th Brazilian Economics Meeting, Brazil.

2.2 Studies Related to Foreign Portfolio Investment (FPI)

Foreign investment in the capital market i.e., foreign portfolio investment, also received equal attention from the academic world. There are several studies about foreign portfolio investment especially by the foreign institutional investors and majority of them are conducted internationally. According to Bekaert and Harvey (1998)[86] stock market performance of the host country or economy itself is a crucial factor in attracting FPI and build their confidence to invest further in stock market. Levine (1997)[87] points out that high stock market return attract foreign investors. Another study by Agbloyor, et al. (2013)[88] gives an interesting observation i.e., development in the banking sector causes foreign investment and foreign investment brings development in the banking system. Industrial production is considered as an important factor influencing the foreign portfolio investment by Chuhan, et al. (1993)[89]. According to them foreign capital flows were less volatile in developed countries where industrial production growth rate was rather stable than emerging countries. Vita and Kyaw (2008)[90] found that output and industrial production as pull factors were the most important forces to explain the volatility in foreign investment flows. Therefore, they conclude that the increase of the industrial production of the host country will increase the foreign investment in that country.

Froot, et al. (2002)[91] explored the interaction between exchange rate and foreign institutional investment flows. Using VAR Analysis and Variance De-

[86] Bekaert, G., Harvey, C.R. (1998). *Capital Flows and the Behaviour of Emerging Market Equity Return.* Working Paper 6669, National Bureau of Economic Research, Cambridge.

[87] Levine, R. (1997). Financial Development and Economic Growth: Views and Agenda. *Journal of Economic Literature*, 35(2), 688-726.

[88] Agbloyor, E. K., Abor, J., Adjasi, C. K., and Yawson, A. (2013). Exploring the Causality Links between Financial Markets and Foreign Direct Investment in Africa. *Research in International Business and Finance*, 28(C), 118-134.

[89] Chuhan, P., Claessens, S., and Mamingi, N. (1993). *Equity and Bond Flows to Asia and Latin America. Policy Research.* Working Papers No. 1160, The World Bank, Washington, DC.

[90] Vita, G.D., and Kyaw, K.S. (2008). Determinants of FDI and Portfolio Flows to Developing Countries: A Panel Co-integration Analysis. European Journal of Economics, *Finance and Administrative Sciences*, 13(4), 124-132.

[91] Froot,. K., and Ramadorai, T. (2002). *Currency Returns, Institutional Investor Flows and Exchange Rate Fundamentals.* NBER Working Paper Series 9080, National Bureau of Economic Research, Cambridge (MA).

composition, they found that foreign institutional flows were highly correlated with exchange rate. Jenkins and Thomas (2002)[92] examined the determinants of foreign portfolio investment (FPI) in six developing Asian countries. Their study using Regression Analysis show that inflation rate, index of economic activity, the share of domestic capital market in the world and stock market capitalization are four statistically significant determinants of FPI. According to the study result except inflation all the other three variables are positive determining factors of FPI and inflation is a negative determinant. Scholars like Rai and Bhanumurthy (2004)[93] found negative effect of domestic inflation on FPI and concluded that inflation in home country and higher returns in host country induce foreign investors to move into the host country. Agarwal (1997)[94] also found negative relation between inflation rate and exchange rate with foreign portfolio investment.

Brink and Viviers (2003)[95] studied the obstacles in attracting investments into Southern Africa. The study identified the underdevelopment of financial market as the major obstacle in attracting FPI. Other obstacles identified were: macro-economic instability, high interest rate, exchange rate risk, high tax structures, and inadequate availability of information and under developed telecom infrastructure. Dahlquist and Robertsson (2002)[96] studied the investment behaviour of foreign investors in association with equity market liberalization in the Swedish equity market and found a strong link between foreign portfolio investment and local market returns. They noticed that in the period following the liberalization, foreigner's net purchases led to a permanent increase in prices, or equivalently, a permanent reduction of the cost of equity capital. Stulz (1999)[97] showed that globalization allows better foreign investors to participate in the market and improve corporate governance, thereby allow-

[92]Jenkins, C., and Thomas, L. (2002). *Foreign Direct Investment in South Africa: Determinants, Characteristics and Implications for Economic Growth and Poverty Alleviation.* Centre for the Study of African Economics, University of Oxford, London.

[93]Rai, K., and Bhanumurthy, N. R. (2004). Determinants of Foreign Institutional Investment in India. The Role of Return, Risk and Inflation. *The Developing Economics*, 42(4), 479-493.

[94]Agarwal, R. (1997). Foreign Portfolio Investment in Some Developing Countries: A Study of Determinants and Macroeconomic Impact. *Indian Economic Review*, 32(2), 217-229.

[95]Brink, N., and Viviers, W. (2003). Obstacles in Attracting Increased Portfolio Investment into Southern Africa. *Development Southern Africa*, 20(2), 213-236.

[96]Dahlquist, M.,and Robertsson, G. (2001). Direct Foreign Ownership, Institutional Investors and Firm Characteristics. *Journal of Financial Economics*, 59(3), 413-440.

[97]Stulz, R. M. (1999). *International Portfolio Flows and Security Markets.* NBER Conference Report Series, University of Chicago Press, Chicago and London.

ing for an improved relationship between the foreign investors and corporate managers. Wang (2004)[98] noticed a significant relationship between foreign portfolio investment and market volatility in Indonesia and Thailand. Outflow of foreign portfolio investment was the most significant causes of market volatility. He reported that contrary to the expected outflows of portfolio investments during the Asian crisis, foreign investors were net buyers in both markets, and that foreign investors appeared to be leading in the price adjustment process in Indonesia.

If the above studies are mainly concentrated on the determinants and impact of FPI in general, there are some other studies which deal with the impact of FPI on the macro economic variables in India. Goldstein et al. (1991)[99] suggested that the right to repatriate dividends and capital might be the most important factor in attracting significant foreign equity flows. According to him countries that allow foreign investors to repatriate capital and income freely and without restriction attract more FPI than countries which impose some restrictions on the repatriation of capital and income.

Williamson (1993)[100] pointed out that when developing countries creditworthiness is restored, capital (bond and equity) flows are likely to become an increasingly prominent source of external finance. According to him although portfolio equity flows to developing countries have increased sharply in recent years, they are expected to be extremely sensitive to a country's openness, particularly to rules concerning the repatriation of capital and income. Sau (1994)[101] presented a simple model to examine the conditions of stability with the inflow of foreign capital. He found that the equilibrium is most likely to be stable if the interest elasticity of direct foreign investment is high and that of foreign portfolio investment is low. But the experience of India is just the reverse, i.e., the possibility of instability. The instability may take the form of appreciation of the rupee accompanied by falling income. He also observed that

[98] Wang, J. (2007). Foreign Equity Trading and Emerging Market Volatility: Evidence from Indonesia and Thailand. *Journal of Development Economics*, 84(2), 798-811.

[99] Goldstein, M., Mathieson, D., and Timothy, L. (1991). *Determinants and Systematic Consequences of International Capital Flows in IMF Research Department.* Occasional Paper 77, Washington DC, IMF.

[100] Williamson (1993). *Issues Posed by Portfolio Investment in Developing Countries.* Discussion Paper 228, Washington DC, World Bank.

[101] Sau, R. (1994). Foreign Direct Investment, Foreign Portfolio Investment and Macroeconomic Stability. *Economic and Political Weekly.* XXIX(7), 386-390.

with the recent liberalization in India, the stock markets are receiving foreign portfolio investment at the rate of some four million dollars per day and FPI in India is attracted by higher interest rate in primary and secondary market of debt market which in turn facilitates appreciation of the currency of the country.

Rao et al. (1999)[102] studied the trends in foreign institutional investment in the Indian stock market. The study begins by drawing attention to the changes in the nature and magnitude of capital flows to developing economies in recent times after briefly examining the favourable and unfavourable impact of FPI on domestic economy, the authors analysed the importance of different types of foreign portfolio investment. The study also examined the countrywide distribution of FIIs registered with the SEBI and the share of different categories of companies in the market value of investments. The study also examined the exposure of five India- specific US funds drawing attention to the changing sectoral importance during the period 1996-98. Based on their study the authors conclude that FII investment considerably influence stock prices in India.

Mohan (2006)[103] also examined the trends in foreign institutional investment in emerging markets in general and India in particular. According to him in mature economies institutional investors have replaced banks as the primary custodian of the savings of the people. These institutional investors are mutual funds, insurance firms, pension funds and hedge funds who command huge resources are diversifying their portfolios through investments in debt and equity in emerging markets. Huge capital flows into emerging markets via foreign institutional investors have substantially augmented the foreign exchange reserves of those economies besides boosting their stock markets. He dispels the fears that FII investment can be destabilizing. In India FII investment has been steady and positive with modest volatility so far. According to him, the real problem caused by variations in FII inflows is not stock market volatility but the difficulties posed in the management of money supply and exchange rate. Rai and Bhanumurthy (2004)[104] examined the determinants of foreign institu-

[102]Rao, Chalpati, K.S., Murthy, M.R., and Ranganathan, K.V.R. (1999). Foreign Institutional Investment and the Indian Stock Market. *Journal of the Indian School of Political Economy*, 9(4), 423-454.

[103]Mohan, T. (2006). Neither Dread Nor Encourage Them. *Economic and Political Weekly*, 3(4), 95-98.

[104]Rai, K., and Bhanumurthy, N.R (2004). Determinants of Foreign Institutional Investment in India: The Role of Return, Risk, and Inflation. *The Developing Economies*, 42(4), 479-493.

tional investment in India. By using monthly data, they found that FIIs inflow depends on stock market returns, inflation rates (both domestic and foreign), and exchange rate risk. In terms of magnitude, the impact of stock market returns and the exchange rate risk turned out to be the major determinants of FII inflow. According to them stabilizing stock market volatility and minimizing the exchange rate risk would help to attract more foreign institutional investment which has a positive impact on the real economy.

Jain et al. (2011)[105] found that FIIs flows to India have steadily grown in importance. According to them all the economies of the world are affected by foreign investment and movement of their capital market is an indicator of the performance of their companies in a particular industry. This paper also attempts to understand the behavioural pattern of FIIs in India. Anand Bansal and Pasricha (2009)[106] using stock market data related to Bombay Stock Exchange, for both before and after the FIIs policy announcement day examined the impact of market opening to FIIs on Indian stock market behaviour. An empirical examination has been conducted to assess the impact of the market opening on the returns and volatility of stock return. They found that there is significant changes in the Indian stock market returns, and volatility.

Sunil and Chandra (2007)[107] examined the influence of foreign institutional investment in explaining the short and long run relationship of the Indian equity market with the main developed equity markets of the US and the UK and concluded that the rapid growth in the flow of the foreign portfolio investment is leading to greater integration of the Indian equity market with the main developed markets and this may have significant implications for asset pricing and international portfolio diversification benefits.

Manjinder and Sharanjit (2010)[108] explored the determinants of foreign in-

[105] Jain, M., Meena, P. L., and Mathur, T. N. (2012). Impact of Foreign Institutional Investment on Stock Market with Special Reference to BSE: A Study of Last One Decade. *Asian Journal of Research in Banking and Finance*, 2 (4), 31-47.

[106] Bansal, A., and Pasricha, J.S. (2009) . Foreign Institutional Investor's Impact on Stock Prices in India. *Journal of Academic Research in Economics*, 1(2), 255-270.

[107] Poshakwale, S., and Chandra, T. (2007). *Impact of Foreign Portfolio Investments on Equity Market Co-movements: Evidence from the Emerging Indian Stock Market.* Emerging Market Group ESRC Seminar on International Equity Markets Co-movements and Contagion, Cass Business School, London.

[108] Kaur, M., and Dhillon, S. S. (2010). Determinants of Foreign Institutional Investor's Investment in India. *Eurasian Journal of Business and Economics*, 3 (6), 57-70.

stitutional investment in India. According to them returns on Indian stock market have positive impact whereas US stock market returns have no significant influence on FIIs investment in India. But stock market risk has however a negative influence on FIIs inflows to India. Market capitalization and stock market turnover of India have significant positive influence only in the short-run. Among macroeconomic determinants, economic growth of India has positive impact on FIIs investment both in long-run and short run. But all other macroeconomic factors have significant influence only in long-run. Inflation in US has positive influence whereas inflation in India has negative influence on FIIs investment in India. Further, hike in the US interest rate has adverse impact on FIIs investment while liberalization policies of India exhibited significant contribution to FIIs inflows. Thus according to them FPI in India are determined by both stock market characteristics and macroeconomic variables of Indian economy.

Patil (2007)[109] examined the current state of the Indian capital market tracing its evolution and growth in the reform era starting in early nineties. He draws attention to the fact that before reforms Indian capital market was really backward in most respects. After the initiation of capital market reforms as part of the economic reforms in the country, the Indian capital market was completely transformed and today it ranks among the best markets. According to Patil this transformation was made possible by reforms such as setting up of the NSE, SEBI, Depositories, Online Trading, Rolling Settlement and the opening up of the market to FIIs.

Rathod (2007)[110] studied the role of Private Equity (PE) Funds in the Indian stock market. According to Rathod developed, mature markets are increasingly getting saturated with low GDP growth and mediocre stock market returns. On the other hand, growth rates have shot up in developing markets like China and India and the consequent high levels of corporate profitability and its apparent sustainability for long periods of time are attracting private equity funds on a massive scale to emerging markets. This seems to be a new trend in global financial markets. Rathod distinguishes between different forms

[109] Patil, R.H. (2006). Current State of the Indian Capital Market. *Economic and Political Weekly*, 41(11), l001-1011.

[110] Rathod, G.D. (2007). Private Equity: Creating Wealth for India Incorporated. *Portfolio Organiser*, 4(3), 14-23.

of investors such as FIIs, PE Funds and Hedge Funds. FIIs usually invest in listed companies. But PE Funds mainly invest in unlisted companies and they invest through a negotiated process since the price of the stock is unknown in the absence of stock market listing.

Chandrasekher (2007)[111] traces the growth of PE Funds in India in recent times. He draws attention to the increasing role of PE Funds in M& A deals struck in India and their probable negative impact on emerging economies via acquisition of domestic companies by foreign companies using the PE route. As and when FDI norms are relaxed, PE Funds can sell the stocks they own to foreign companies or takeover specialists through block deals. This will weaken the domestic corporate sector. Chandrasekher traces the emergence and growth of PE Funds globally. Chandrasekher focuses on the areas of concern arising from PE investment. According to him the very nature of the business organization is not transparent unlike registered FIIs. Chandrasekher's study, warns the possibility of the takeover of domestic companies by foreign companies.

The writers who studied the post reform capital market in India observed that repatriate dividends and capital, credit worthiness of host countries, domestic and foreign inflation rate, economic growth, etc. are the major factors which attracted FPI to India. All of them recognised the huge capital flows into India after the granting of FPI. Prasuna (2000)[112] studied the determinants of FIIs investment in India using monthly data from 1993 to 1998 and found that there is significant relation between FIIs investment and BSE returns whereas exchange rate, interest rate, forward premium and foreign exchange reserves have only insignificant relation to FIIs investment. Similarly Saraogi (2008)[113] investigated the determinants of FIIs flows into India using monthly data from 2001 to 2007 and found BSE market returns has positive impact on FIIs. Besides, according to the study the impact of inflation and exchange rate on FIIs flows into India is negative. Kaur and Dhillon (2010)[114] also put forward a similar view. According to their study based on monthly data from 1995 to 2006,

[111]Chandrasekher, C.P. (2007). Private Equity: A New Role for Finance?. *Economic and Political Weekly*, 42(13), 1136-1145.

[112]Prasuna, C. A. (2000). Determinants of Foreign Institutional Investment in India. *Finance India*, 14(2), 411-421.

[113]Saraogi, R. (2008). *Determinants of FIIs Inflows: India*. MPRA Working Paper No.22850.

[114]Kaur, M., and Dhillon, S. (2010). Determinants of Foreign Institutional Investors Investment in India. *Eurasian Journal of Business and Economics*, 3(6), 57-70.

Indian stock market return has positive impact on FIIs flow in India. But they argue that inflation has negative influence on FIIs flows into India.

Other writers like Kumar and Gupta (2010)[115], also agreed with this view. According to them stock return and exchange rate are the major determinants of FIIs flows into India. But there is a bi- directional causality between the returns of the Indian stock market and the foreign investment flows. Bhasin and Khandelwal (2013)[116] identified the determinants of FIIs inflows in India, with special reference to the impact of crisis, using monthly data from April 1994 to December 2011. They found that the factors affecting FIIs inflows to India are market index return, and the growth rate of the economy etc. They also found the global financial crisis of the year 2008 had a significant impact on net FII inflows. Srinivasan and Kalaivani (2013)[117] explored the determinants of foreign institutional investments in India through ARDL Bounds Testing Approach and showed that exchange rate has significant negative impact on FIIs inflows both in the short-run and long-run, implying that depreciation of currency adversely affects the FII flows into India.

Garg and Bodla (2009)[118] examined the determinants of FIIs in Indian stock market and found that the market return is the prime mover of the net FII inflows into India. Nidhi Dhamija (2008)[119] made an exploratory analysis of the investment of FIIs patterns across firms to examine the role of various factors relating to individual firm level characteristics and macro level conditions influencing FII. It was found that the regulatory environment of the host country plays a major role impacting the FIIs. Tripati and Rudra (2007)[120] added good monetary policies and stabilize foreign exchange market to the determinants of FII inflow into India. Mishra (2010)[121] also found that reciprocal relationship

[115]Kumar, R., and Gupta, H. (2010). FIIs Flows to India: Economic Indicators. *SCMS Journal of Indian Management*, 7(1), 104-116.

[116]Bhasin, N., and Khandelwal, V. (2013). Foreign Institutional Investment in India: Determinants and Impact of Crises. *The Indian Journal of Commerce*, 66(2), 1-15.

[117]Srinivasan, P., and Kalaivani, M. (2013). *Determinants of Foreign Institutional Investment in India: An Empirical Analysis*. MPRA Working Paper No. 43778, University Library of Munich, Germany.

[118]Garg, A., and Bodla, B.S., (2009). Determinants of FIIs Investment in Indian Stock Market. *Abhigyan*, 26(4), 12-24.

[119]Dhamija, N. (2008). Foreign Institutional Investment in India - An Exploratory Analysis of Pattern Across Firms. *Margin-Journal of Applied Economic Research*, 2(3), 287-320.

[120]Tripati, R.D., and Rudra, S. (2007). Interest Rate Signals, Stock Returns and FII Inflows: Exploring the Inter Linkages, Metamorphosis. *Journal of Management Research*, 6(1), 54-68.

[121]Mishra, P.K. (2010). The Estimation of Relationship between Foreign Investment Flows and Economic

between FII and economic growth in India in his study in the period 1993-2009.

Amita (2014)[122] identified the determinants of foreign institutional investment and established a relationship between them using exchange rates, BSE Sensex, foreign exchange reserves and inflation as variables. She used secondary data obtained on monthly basis collected from 2001-02 to 2012-13. Econometric tools, Augmented Dicker Fuller Test and Granger Causality Test are used to analyse the data. The correlation coefficient between FIIs and Sensex, FIIs and FERs, FERs and Sensex, and WPI and Sensex were found positive. However, exchange rate and inflation showed negative relationship with FIIs. The results of Granger Causality Model indicated bi-directional causality between FII and Sensex, and FII and exchange rate. However, no causality was found between FII and foreign exchange reserves.

Basu and Morey (1998)[123] analysed the impact of economic reforms (since 1984) on stock market return in India. They employed the Non-parametric Variance Ratio Tests spanning over the period 1957 to 1996. The study showed that from mid 1980s, equity prices in India behaved like a 'random walk' suggesting that the market obeyed Fama's Efficient Market Hypotheses, till the securities scam of 1991- 92.

There are some scholars who paid attention to the impact of FPI on the Indian economy. For example (Sethi 2012)[124] using the Vector Auto Regression (VAR) method, examined the effects of foreign capital inflows on the macroeconomic variables such as exchange rate, inflation, money supply, foreign exchange reserve, etc. in India with the help of monthly data from 1995 to 2011. The results showed that there is a dynamic short and long equilibrium relationship between macroeconomic variables like exchange rate, foreign exchange reserve, and money supply with foreign capital inflows. But no significant relation between foreign investment and inflation is found. Ghosh and Herwadkar (2009)[125] found that there exist a long term relation between foreign capital

Growth in India. *Asian Economic Review*, 52(3). 521-531.

[122]Amita (2014). Determinants of FIIs: Evidence from India. *International Journal of IT and Knowledge Management*, 8(1), 85-95.

[123]Basu, P., and Morey, R.M. (1998). Stock Market Prices in India After Economic Liberalization. *Economic and Political Weekly*, 4(3), 355-358.

[124]Sethi, N. (2012). Inflows and Their Macroeconomic Impact in India a VAR Analysis. *The Romanian Economic Journal*, 15(46), 93-142.

[125]Ghosh, S., and Herwadkar, S. (2009). *Foreign Portfolio Flows and Their Impact on Financial Markets*

flows and exchange rate appreciation. In the short run, the VAR and Impulse Response Functions also indicated that a positive shock to net FII flows generally result in exchange rate appreciation.

Babu and Prabheesh (2008)[126] argued in their study using like VAR, Impulse Response and Granger Causality Test to study the relationship between FIIs flows and stock market return in India and found that there is a reciprocal relationship between the FIIs flows and stock market return in India. i.e., Changes in Nifty caused changes in FII flows and changes in FIIs flows cause changes in Nifty. However impact of stock return on FIIs flows is higher than the impact of FIIs on the stock return. The Impulse Response Function (IRF) showed that the flows of FII in the Indian economy were more driven by the Indian stock market returns. Gordon and Gupta, (2003)[127] confirmed causal effect from FII inflows to return in BSE. They observed that FIIs act as market makers and book profits by investing when prices are low and selling when they are high. Therefore, there is a need to investigate whether FIIs are the cause or effect of stock market fluctuations in India. Pal (2004)[128] found that FIIs are the major players in the Indian stock market and their impact on the domestic market is increasing. Trading activities of FIIs and the domestic stock market turnover indicate that FIIs are becoming more important and increasingly higher share of stock market turnover is accounted by FIIs trading in India.

The above discussion made so far does not mean that all the writers are holding a positive view about FPI. There are several writers who strongly criticise FPI in general and FPI in India in particular. Singh (1998)[129] examined the growth and evolution of stock markets in India during 1990s which according to him is largely due to internal and external liberalization measures and the general liberal economic ethos created by the reforms. He argued that even

in India. Reserve Bank of India Occasional Papers, 30(3), 2-22.

[126] Babu, S., and Prabheesh, K.P. (2008). Causal Relationship between FIIs and Stock Returns in India. *International Journal of Trade and Global Market*, 1(3), 259-265.

[127] Gordon, J., and Gupta, P. (2003). *Portfolio Flows into India: Do Domestic Fundamentals Matter?*. IMF Working Paper, Number WP/03/20.IMF, Washington, DC.

[128] Pal, P. (2004). Foreign Institutional Investment in India. Research on Indian Stock Volatility, Vol.12, Emerald Group Publishing Limited.

[129] Singh, A. (1998). Liberalization, the Stock Market and The Market for Corporate Control; A Bridge too far for the Indian Economy. In I.J Ahluwalia and I.M.D Little (eds), India's Economic Reforms and Development. *Oxford University Press*, 1691-99.

though the corporate sector considerably benefited from the boom in the stock market by raising huge amounts of capital including foreign exchange, from the market, the aggregate real economy did not benefit from this. He did not see any increased productive use of investment resources. His conclusion is that despite all the extraordinary growth achieved by the stock market, as far as the real economy was concerned, it has just been a sideshow. He also sounded a note of warning that with the development of corporate control as a result of mergers, takeovers, acquisitions and divestments, the situation will worsen and the real economy will be harmed by these developments.

A comprehensive empirical work came from Nagaraj (1996)[130]. He examined the long-term trends in India's capital markets and the structural changes that have taken place in the country's saving pattern. Examining important indicators like the amount of capital raised, share of equity in total capital mobilized, share of financial saving in Gross Domestic Savings, Gross Fixed Capital Formation, Corporate Profitability etc. he came to the following conclusions: In India, the growth of the capital market was in fact was portfolio substitution by households and institutions from bank deposits to stock market instruments. There is no correlation between growth rate of capital mobilization, aggregate saving rate and corporate physical investment. The positive correlation between the annual growth rate of capital rose externally and the corporate fixed capital formation, which existed previously, was statistically insignificant in the 1980s. There is a long-term decline in the contribution of internal finance to corporate fixed investment, despite a fall in the ratio of corporate tax to gross profit. The growth rate of real value added in the corporate manufacturing sector in the 1980s was lower than that of registered manufacturing sector as a whole suggesting that the small corporate firms, which did not have access to stock market funds, were able to grow at a faster rate than the larger corporate firms.

Another prominent critic of hasty financial liberalization and foreign portfolio investment is Stiglitz (1998)[131]. Citing the example of South East Asian countries during the South East Asian currency crisis of 1997-98, he argued

[130] Nagraj, R. (1996). India's Capital Market Growth, Trends, Explanations and Evidence. *Economic and Political Weekly*, 31(35), 2553-61.

[131] Stiglitz, J.E. (1998). The Role of International Financial Institutions in the Current Global Economy. The Rebel Within London, Wimbledon Publishing Company, 172-193.

that developing countries are far more vulnerable to volatility in capital flows and it will ruin the financial and real sectors of the economy. Therefore he advocated greater control and regulation of capital flows into the developing countries. Durham (2004)[132] studied the effects of FDI and Equity Foreign Portfolio Investments (EFPI) on economic growth using data on 80 countries for the period 1979-1998. He constructed six capital absorptive variables and framed regression equations. The complete cross sectional analysis covered data on 62 non-OECD (Organization of Economic Co-operation and Development) and 21 high income countries. The study found that the effects of FDI and EFPI on growth depend on the absorptive capacity of host countries and this in turn depends on the institutional and financial absorptive variables.

Thus his important conclusion is that the effects of FDI and EFPI depend on the 'absorptive capacity' of host countries. His analysis also showed that FDI and EFPI have no unmitigated positive effect on economic growth. Therefore, he suggested that leaving financial markets alone is not a good way to encourage them and unfettered capital flows do not necessarily enhance growth.

Rishit (2007)[133] presented a critique of the approach and recommendations of the 2004 Government of India Expert Group on Foreign Institutional Flows. The Expert Group was set up to 'suggest measures for encouraging foreign institutional flows'. While recognizing the fact that FII flows have strengthened India's balance of payments position, he cautions against unbridled encouragement of highly volatile and potentially destabilizing FII flows as there is no empirical evidence proving the beneficial impact of such flows on economic growth. He also questioned the government's policy assumption that FII flows are always investment and growth promoting.

Soros (2004)[134], because of the influences of East Asian Currency Crisis, argues for intervention of international financial authorities to rescue the global capitalist system from its grave crisis. According to him the global economy characterized by free trade in goods and services and free movement of capital

[132] Durham, J.B. (2004). Absorptive Capacity and the Effects of FDI and EFPI on Economic Growth. *European Economic Review*, 48(2), 285-306.

[133] Rishit, M. (2007). On Liberalizing Foreign Institutional Investment. *Economic and Political Weekly*, XLI(11) 991-1000.

[134] Soros, G. (2004). The Crisis of Global Capitalism [Open Society Endangered] Viva Books, New Delhi.

across national boundaries have led to a situation where interest rates, exchange rate and stock prices in various countries are intimately interrelated, and global financial markets exert tremendous influence on economic conditions. Market volatility and currency crisis of the last two decades have produced far reaching economic and political consequences. Mayer (1989)[135] also put forward very strong theoretical disagreements with the World Bank's views on stock market development and economic growth. Based on his studies using corporate balance sheets Mayer observed that in no country do companies raise substantial amount of finance from the securities market and banks are the main sources of external finance in all countries.

Sula and Willet (2006)[136] are also prominent critics of FPI. According to them despite its numerous virtues, FPI could have adverse effects on the host economy. Similarly Kunt and Detragiache (1999)[137] made a case study of countries which experienced financial crisis and came to the conclusion that the volatility of foreign portfolio investment makes stock market volatile and this volatility leads to financial crisis. Patro and Wald (2005)[138] explained a little more and examined how FPI adversely affect the host economy. According to him FPI instability complicates the implementation of macroeconomic stabilisation policies by the policymakers. Uncertainties in the flow of FPI result in unpredictable behaviour of money supply, exchange rate level and stock market volatility. Bank Negara Malaysia (2006)[139] viewed the situation in a different way. i.e., he argued that sustained periods of excessive capital inflows due to high capital mobility could result in the formation of asset price bubbles, leading to inflationary pressure, while sudden withdrawals in portfolio investment accompanied by major correction in asset prices can pose serious risk to the economy. Duasa and Kassim (2009)[140] examined foreign portfolio investment

[135]Mayer. (1989). *Myths of the West: Lessons from Developed Countries for Development Finance.* W.P.S 301, The World Bank, Washington, D.C.

[136]Sula, O., and Willett, T.D. (2006). *Reversibility of Different Types of Capital Flows to Emerging Markets.* MPRA Paper 384, University Library of Munich, Germany.

[137]Demirguc-Kunt, Asli, and E. Detragiache (1999). *Financial Liberalisation and Financial Fragility.* Proceedings of the World Bank Annual Conference on Development Economics, W.P. No 1917, The World Bank.

[138]Patro, D., and Wald, P. (2005). Firm Characteristics and the Impact of Emerging Market Liberalisation. *Journal of Banking and Finance*, 29(7), 1671-1695.

[139]Bank Negara Malaysia (2006). Financial Stability and Payment Systems Report. Kuala Lumpur.

[140]Duasa, J., and Kassim, S.H. (2009). Foreign Portfolio Investment and Economic Growth in Malaysia. *The Pakistan Development Review*, 48(2), 109-123.

and economic growth in Malaysia. They followed Granger Causality Test and Toda and Yammamoto's Non Causality test for their study of the impact of FPI on the economic growth of Malaysia. According to them whenever the Malaysian economy witnessed weakness there was lower FPI inflow to Malaysia and massive FPI outflow from there.

2.3 Research Gap

The review of literature made so far shows that the current interest in foreign investment, especially since globalization, is also reflected in the literature related to foreign investment. Yet despite the large volumes of works, the literature on foreign investment in India is comparatively very few i.e., it is disproportionate with the quantity of foreign investment in India. This calls for more research in this area.

Similarly as observed earlier comprehensive studies about foreign investment are very scarce. Majority of them are in the form of research papers focusing either one of the two aspects of foreign investment viz FDI or FPI by means of commonly used statistical tests like Ordinary Least Square Method, Granger Causality Test etc. Since neither FDI nor FPI is a true representation of foreign investment in India, such exclusive studies on FDI or FPI cannot give a comprehensive view of foreign investment in India. For example it may be fallacious if one comes to the conclusion that foreign investment has a positive impact on Indian economy solely on the basis of an exclusive study of FDI or foreign investment has negative impact on the Indian economy on the basis of another exclusive study on FPI. Because both FDI and FPI belong to different categories in the sense that the former is comparatively a permanent form of foreign investment whereas the latter is comparatively a volatile form of foreign investment.

Again, studies which appear either one of the above broad category further specialise only certain aspects of FDI or FPI; like the determinants of FDI or FPI or their impact on particular macroeconomic variables like economic growth, inflation, exchange rate etc. In this sense existing literature on foreign investment are micro in nature as they emphasize only one or two economic variables. Further with regards to the impact of foreign investment on these variables, or the role of these variables in attracting FDI or FPI, there is no consensus among writers. For example when some scholars argue that there is a positive relationship between FDI and economic growth, some others find that it is negative. Same is the case with the determinants of foreign investment too. When some find great role for economic reforms in attracting foreign investment others attribute major role for the macroeconomic variables.

similarly since each economic variable is unique in itself simply by studying a particular variable it is not possible to arrive at generalization about the impact of foreign investment on Indian economy. For instance by finding out that foreign investment is conducive for economic growth in India, one cannot generalize that foreign investment is favourable for Indian economy as a whole. Same is the case with the other variables like inflation where, foreign investment may have a negative impact on Indian economy. Here also it will not be accurate to arrive at generalization just because of the adverse relationship between inflation and foreign investment. Likewise, there are some sectors like agriculture which are insensitive to foreign investment to a great extent. Hence the neutral impact of foreign investment on agriculture alone may not present a true picture about the impact of foreign investment on Indian economy in general.

All these lead to the necessity of investigating and finding out the impact of foreign investment on various macroeconomic variables of the Indian economy and measure their real depth or degree of relationship and impact with the help of various advanced statistical tests[141]. In the light of the above observations and conclusions the present study makes a modest attempt to analyse the impact of foreign investment on Indian economy and to make necessary amendments to the existing literature and update it to cope with the demands and requirements of the present economic scenario of foreign investment in India. And this attempt begins with a survey and analysis of the structure and component of foreign investment in India in the next chapter.

[141]The relationship between two variables can be placed under two categories - significant relationship and insignificant relationship. As per Regression Analysis if a test result comes below 10 percentage of probability value it will be treated as significant and vice versa. Similarly using Correlation the degree of relationship can be categorized as highly positive, positive, highly negative, negative etc.

Chapter 3

Structure and Composition of the Foreign Investment in India

The 1990s were a dividing line and a turning point in the economic history of India as the 1940s in her political history. Just as in the second half of 1940s India woke up into political freedom, in the first half of the 1990s she liberated herself from her self - imposed economic restrictions through a series of economic reforms. The reforms which were in the nature of elimination of the market barriers, encouragement of private sector etc. were tailored to suit the growth rate of the economy and which in turn resulted in the free flow of foreign investment into India.

During the days of British rule Britain exported her capital to India but it was used as a means of exploitation. There were two major forms of British investment in India - direct private foreign investment made in coal, mining companies, jute mills, tea, coffee, rubber plantation and in sugar and sterling loans given to British government in India and public and semipublic organizations to undertake investment in railways, ports, electricity undertakings and other public utilities. These loans represented sterling debt. The British considered their investment in India as a favour done to India and claimed that the British capital was necessary because Indian capital was shy whereas British capital was adventurous. However Indian scholars criticize this view. Novorogi (1876)[142] in his classic paper on "Poverty and Unbritish Rule in India" argued

[142]Naorogi, D. (1901). Poverty and UnBritish Rule in India. Publication Division, Ministry of Information

that foreign investment and other exploitation by the British led to the drain of India's wealth. It is argued that free flow of foreign capital meant economic stagnation in India, while their absence (partial or total) provided an opportunity for Indian capital to open up avenues of industrial growth in areas choked off by imports.

Thus long years of foreign rule and foreign investment and their negative impact on her economy, India's commitment to socialistic pattern of society etc. influenced India to keep her economy a restriction ridden one and to maintain a tight regulatory economic regime not only related to domestic economic affairs but also in her foreign economic relations. Prior to 1991, capital flows to India predominantly consisted of aid flows, commercial borrowing and non-resident Indian deposits. Direct foreign investment was limited. Foreign companies wishing to invest in India were generally restricted to 40 percent equity participation subjected to requirements on technology transfer and limited to priority areas. Foreign portfolio investment was channeled almost exclusively into a limited number of public sector bond issues, while foreign equity holdings in Indian companies were not permitted. Emphasis was given for self-reliance and import-substitution. Debt flows and official development assistance were the major sources for meeting the current account deficits. In short there was a general dislike and distrust towards foreign investment.

By the end of 1980s, this policy began to receive shocking setbacks. The macroeconomic crisis that erupted in the first half of 1991 brought to a steep fall in foreign exchange reserves of India to about US $1 billion (equal to two week's imports), a sharp downgrading of India's credit rating, and a cut-off of foreign private lending. Its basic underlying features were high inflation (above 12 percent) large external debt and current account deficits (approximately 10 percent and 3 percent of GDP respectively) and a heavy and growing burden of domestic and foreign debt. These factors compelled India to depart drastically from her economic policies including the policy on capital market.

and Broadcasting, Patiala.

3.1 Liberalization - India's Invitation of Foreign Investment

The origin of the above change of policy which came to be known as liberalization, can be traced back to the 1980s when India was compelled to borrow 5 billion US dollars from the IMF under Structural Adjustment Program, accepting the terms and conditions imposed by the latter and in the Report of the High Level Committee on Balance of Payments which gave importance to the need of non-debt flows instead of the debt flows, regulation of the external borrowing, control of the outflows in general and from Non-Resident Indians (NRIs) in particular, gradual shift towards capital account convertibility etc. The net result of all these are the birth of two major policies which paved the way for liberalization in India. They are the New Industrial Policy of 1991 and the New Economic Policy of 1992[143]. These policies substantially liberalized the terms and conditions of foreign investment in India and thus laid the foundation of modern foreign investment boom in India.

The main target of the new industrial policies of 1991 and 1992 was the lifting of restrictions imposed on foreign capital. This policy released huge concessions and relaxations of foreign capital instead of the then existed restrictions. It permitted foreign investment in minor industries, changed the policies and procedures related to FDI and FPI. As part of these policies Government has permitted FDI up to 100 percent under Automatic Route in most sectors. In short now the situation has been reversed i.e., if formerly the permitted areas of foreign investment were limited, now the prohibited or restricted areas of foreign investment became limited.

3.2 Foreign Direct Investment (FDI) in India

As mentioned above India's development strategy before the 1990s was dominated by a general dislike towards foreign investment, focused on self-reliance and import substitution, meeting of current account deficit through debt and

[143] Provisions of these two policies are given in Appendix B.1 and B.2

development assistance etc. But the 1990s witnessed a drastic change to this policy i.e., policy of pulling foreign investment.

However it does not mean that all the sectors of the Indian economy are equally liberalized for foreign direct investment. In other words even now there are some restricted sectors of foreign direct investment. These restrictions have been imposed in order to protect the interests of the country, as they either relate to national security or sensitive enough to keep apart the foreign companies, to keep the domestic companies from the competition from international firms etc. The few sectors of the Indian economy now restricted for foreign direct investment are: nidhi company, betting and gambling including casinos, chit fund business, real estate business, business in transferable development rights, lottery business, atomic energy, railways etc. It is true that governments have restricted foreign investment in certain sectors for the interest of the country as a whole but it is equally important that governments should take certain steps to encourage foreign direct investment in certain sectors preferably the underdeveloped sectors of the Indian economy.

3.2.1 Composition of the Foreign Direct Investment in India

Foreign direct investment in India has three components, viz., Equity Capital, Reinvested Earnings and Intra-Company Loans. Table 3.1 and Figure 3.1 show that foreign direct investors invested more through Equity Capital than Reinvested Earnings and Other Capital during the period 1991-2018. That is during this period their investment in Equity Capital, Reinvested Earnings and Other Capital was 68 percent, 27 percent and 5 percent respectively. It is observed that the foreign investors preferred to invest in Indian corporate through Equity Capital as compared to other forms of foreign direct investment. The preference given for Equity Capital in the liberalization policies is the major reason for the preference for Equity Capital in the foreign direct investment.

Table 3.1: Composition of Net FDI Inflows into India (US $ Million)

Year	Equity	Reinvested Earnings	Other Capital	Net FDI
1991-92	129	-	-	129
1992-93	315	-	-	315
1993-94	586	-	-	586
1994-95	1343	-	-	1343
1995-96	2143	-	-	2143
1996-97	2842	-	-	2842
1997-98	3562	-	-	3562
1998-99	2480	-	-	2480
1999-00	2167	-	-	2167
2000-01	2399	1352	280	4031
2001-02	4091	1644	390	6125
2002-03	2766	1832	438	5036
2003-04	2229	1460	633	4322
2004-05	3714	1904	369	5987
2005-06	5915	2760	226	8901
2006-07	16394	5828	517	22739
2007-08	26757	7679	292	34728
2008-09	31930	9030	777	41737
2009-10	22905	8669	1535	33109
2010-11	15737	13102	191	29029
2011-12	22833	8205	1914	39952
2012-13	16032	9880	1041	26953
2013-14	20489	8978	1296	30763
2014-15	22298	9988	2997	35283
2015-16	30587	10413	3907	44907
2016-17	27383	12343	2489	42215
2017-18	24196	12542	2492	39430
Total	**314222**	**127609**	**21984**	**463814**

Source: Compiled from Handbook of Statistics on Indian Economy

3.2.1.1 Foreign Direct Investment in India through the Equity Capital

Equity Capital that is foreign direct investors' purchase of shares of an enterprise in a country other than its own, is the dominant component of foreign

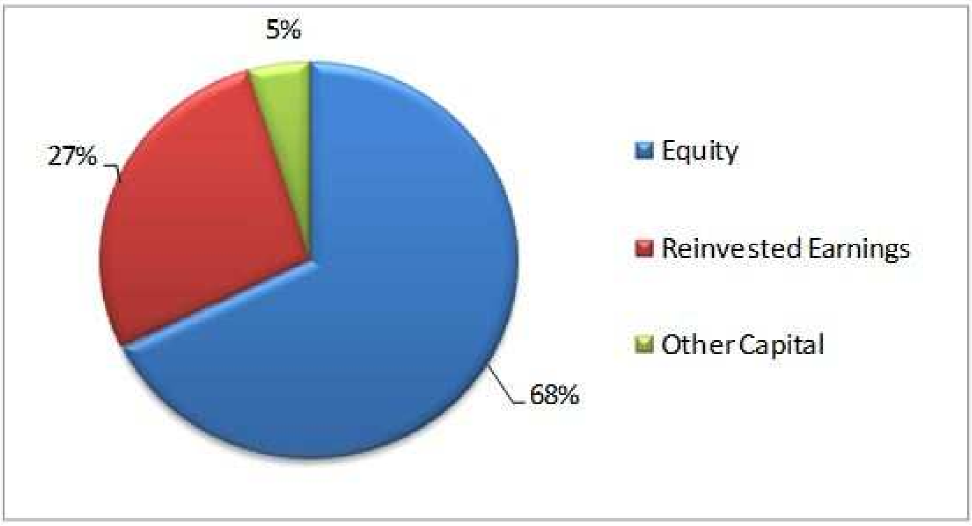

Figure 3.1: Composition of Net FDI Inflows into India (US $ Million)

direct investment in India. Table 3.2 and Figure 3.2 demonstrate the flow of foreign direct investment through the Equity Capital in India. Foreign direct investment in Equity Capital has been increased from $129 million in 1991-92 to $24196 million in 2017-18 and its compound annual growth rate is 22.30 percent.

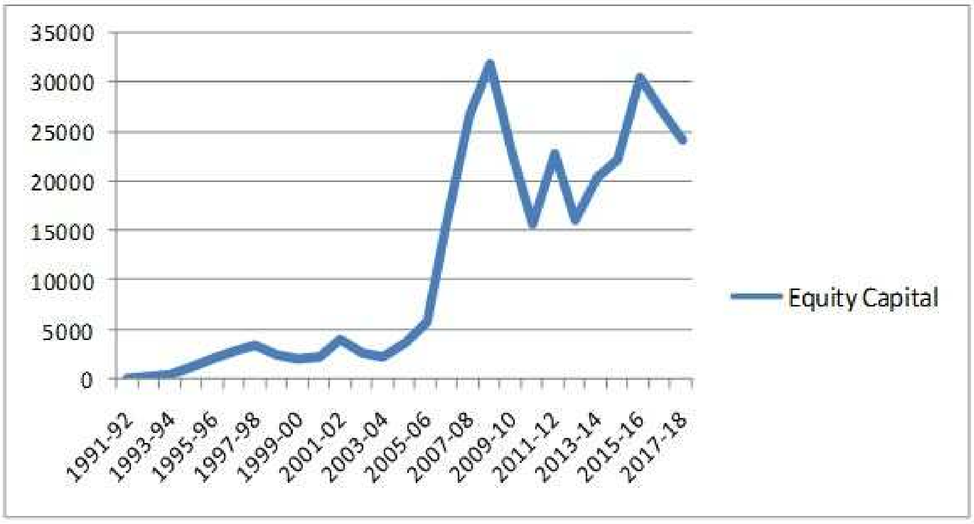

Figure 3.2: Flow of Foreign Direct Investment through Equity Capital

Table 3.2: Flow of FDI through Equity Capital (US $ Million)

Year	Equity Capital	FDI Flows	Percentage Contribution of Equity Capital to Total FDI	Annual Growth Rate of Equity Capital (%)
1991-92	129	129	100	-
1992-93	315	315	100	144.18
1993-94	586	586	100	86.03
1994-95	1343	1343	100	129.18
1995-96	2143	2143	100	59.56
1996-97	2842	2842	100	32.61
1997-98	3562	3562	100	25.33
1998-99	2480	2480	100	-30.37
1999-00	2167	2167	100	-12.62
2000-01	2399	4031	59.51	10.7
2001-02	4091	6125	66.79	70.52
2002-03	2766	5036	54.92	-32.38
2003-04	2229	4322	51.57	-19.41
2004-05	3714	5987	62.03	66.62
2005-06	5915	8901	66.45	59.26
2006-07	16394	22739	72.09	177.15
2007-08	26757	34728	77.04	63.21
2008-09	31930	41737	76.50	19.33
2009-10	22905	33109	69.18	-28.26
2010-11	15737	29029	54.21	-31.29
2011-12	22833	39952	57.15	45.09
2012-13	16032	26953	59.48	-29.78
2013-14	20489	30763	66.60	27.8
2014-15	22298	35283	63.19	8.82
2015-16	30587	44907	68.11	37.17
2016-17	27383	42215	64.86	-10.47
2017-18	24196	39430	61.36	-11.63
Total	**314222**	**463814**		

Source: Compiled from Handbook of Statistics on Indian Economy

Routes of Equity Capital Inflows

Foreign direct investment in Equity Capital are permitted through five areas or routes. They are: the Government Route (SIA/FIPB)[144], RBI (Automatic

[144] FDI in sectors not covered under the Automatic Route requires prior Government approval and are considered by the Foreign Investment Promotion Board (FIPB), Ministry of Finance.

Route)[145], Investment by NRIs, Acquisition of Shares, and Equity Shares of Unincorporated Bodies.

Table 3.3: Routes of Equity Capital Inflow (US $ Million)

Year	SIA/FIPB	RBI	NRI	Acquisition of Shares	Equity Shares of Unincorporated Bodies	Total
1991-92	66	-	63	-	-	129
1992-93	222	42	51	-	-	315
1993-94	280	89	217	-	-	586
1994-95	701	171	442	-	-	1314
1995-96	1249	169	715	11	-	2144
1996-97	1922	135	639	125	-	2821
1997-98	2754	202	241	360	-	3557
1998-99	1821	179	62	400	-	2462
1999-00	1410	171	84	490	-	2155
2000-01	1456	454	67	362	61	2400
2001-02	2221	767	35	881	191	4095
2002-03	919	739	-	916	190	2764
2003-04	928	534	-	735	32	2229
2004-05	1062	1258	-	930	528	3778
2005-06	1126	2233	-	2181	435	5975
2006-07	2156	7151	-	6278	896	16481
2007-08	2298	17127	-	5148	2291	26864
2008-09	5400	21332	-	4632	702	32066
2009-10	3471	18987	-	3148	1504	27146
2010-11	1945	12994	-	6437	874	22250
2011-12	3046	20427	-	11360	1021	35854
2012-13	2319	15967	-	3539	1059	22884
2013-14	1185	14869	-	8245	975	25274
2014-15	2219	22530	-	6185	978	45148
2015-16	3574	32494	-	3933	1111	41112
2016-17	5900	30417	-	7161	1223	44701
2017-18	7797	29569	-	7491	664	45521
Total	**59447**	**251007**	**2616**	**80948**	**14735**	**422025**

Source: Compiled from RBI Bulletin

Table 3.3 shows that in 1991-92 there was only two routes namely SIA/FIPB and NRI. The other three routes i.e., RBI route, Acquisition of Shares and

[145] FDI is allowed under the Automatic Route without prior approval either of the Government or the Reserve Bank of India in all activities/sectors as specified in the Consolidated FDI Policy, issued by the Government of India from time to time.

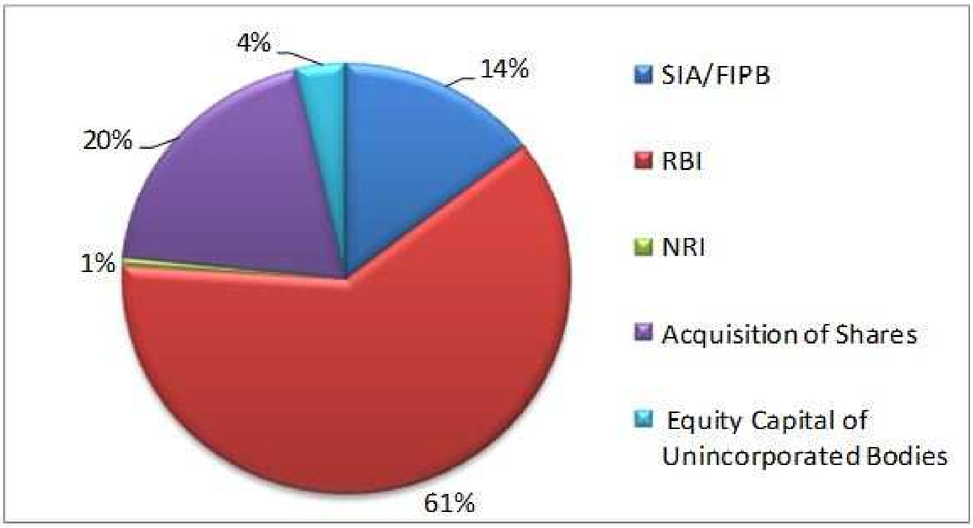

Figure 3.3: Route of Equity Capital Inflows (US $ Million)

Equity Capital of Unincorporated Bodies were began to contribute in 1992-93, 1995-96 and 2000-01 respectively. NRI routes has been stopped in 2001-02. All routes are highly fluctuating from its inception itself. Figure 3.3 shows that Automatic Route (RBI Route) has prominent role in FDI equity flows i.e., 61 percent of total FDI Equity Capital Flows came through Automatic Route. The percentage of contribution of other routes - Acquisition of Equity Shares, Government Route (SIA, FIPB), Equity Capital of Unincorporated Bodies, and NRI - to the total Equity Capital Flows is 20, 14, 4, and 1 respectively.

3.2.1.2 Reinvested Earnings

Reinvested Earnings comprises the direct investor's share (in proportion to direct equity participation) of earnings not distributed as dividends by affiliates, or earnings not remitted to the direct investor. Such retained profits by affiliates are reinvested.

Table 3.4 shows that the flow of foreign direct investment through Reinvested Earnings opened its account only in the year 2000-01 and from its inception onwards it shows a fluctuating trend. It achieved a remarkable and highest growth rate of 111% in the year 2006-07. FDI in Reinvested Earnings has been increased from $1352 million in 2000-01 to $12542 million in 2017-18. It has recorded an impressive compound annual growth rate of 14 percent,

Table 3.4: Flow of FDI through Reinvested Earnings (US $ Million)

Year	Reinvested Earnings	Total FDI	Percentage of Contribution of Reinvested Earnings to Total FDI	Annual Growth Rate of Reinvested Earnings (%)
1991-92	-	129	0	0
1992-93	-	315	0	0
1993-94	-	586	0	0
1994-95	-	1343	0	0
1995-96	-	2143	0	0
1996-97	-	2842	0	0
1997-98	-	3562	0	0
1998-99	-	2480	0	0
1999-00	-	2167	0	0
2000-01	1352	4031	33.54	0
2001-02	1644	6125	26.84	21.6
2002-03	1832	5036	36.38	11.44
2003-04	1460	4322	33.78	-20.31
2004-05	1904	5987	31.8	30.41
2005-06	2760	8901	31.01	44.96
2006-07	5828	22739	25.63	111.16
2007-08	7679	34728	22.11	31.76
2008-09	9030	41737	21.64	17.59
2009-10	8669	33109	26.18	-4
2010-11	13102	29029	45.13	51.14
2011-12	8205	39952	20.54	-37.38
2012-13	9880	26953	36.66	20.41
2013-14	8978	30763	29.18	-9.13
2014-15	9988	35283	28.3	11.25
2015-16	10413	44907	23.18	4.26
2016-17	12343	42215	29.23	18.53
2017-18	12542	39430	31.8	1.61
Total	**127609**	**463814**		

Source: Compiled from Handbook of Statistics on Indian Economy

during the last eighteen years. (refer Figure 3.4).

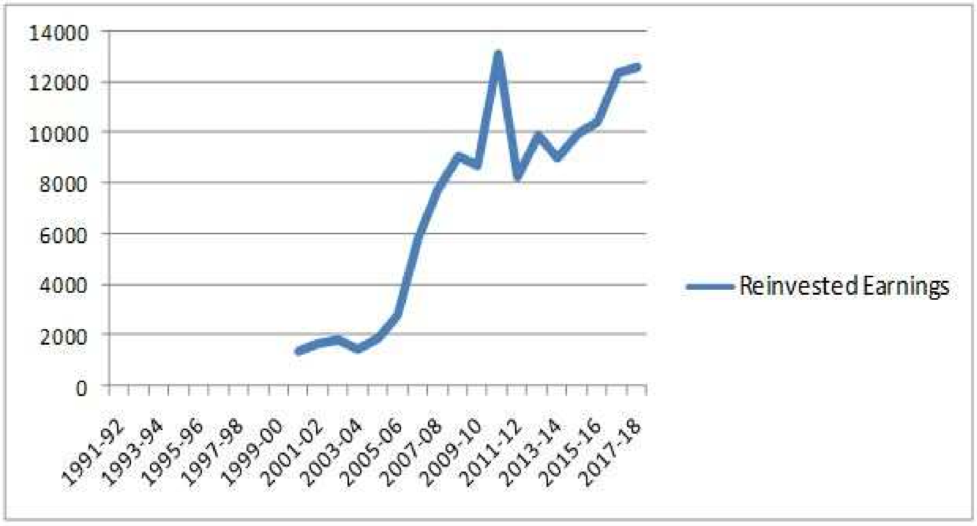

Figure 3.4: Flow of Foreign Direct Investment through Reinvested Earnings

3.2.1.3 Other Capital

Other Capital or Intra-Company Loans / Intra-Company Debt Transactions refers to short or long-term borrowing and lending of funds between direct investors (parent enterprises) and affiliate enterprises.

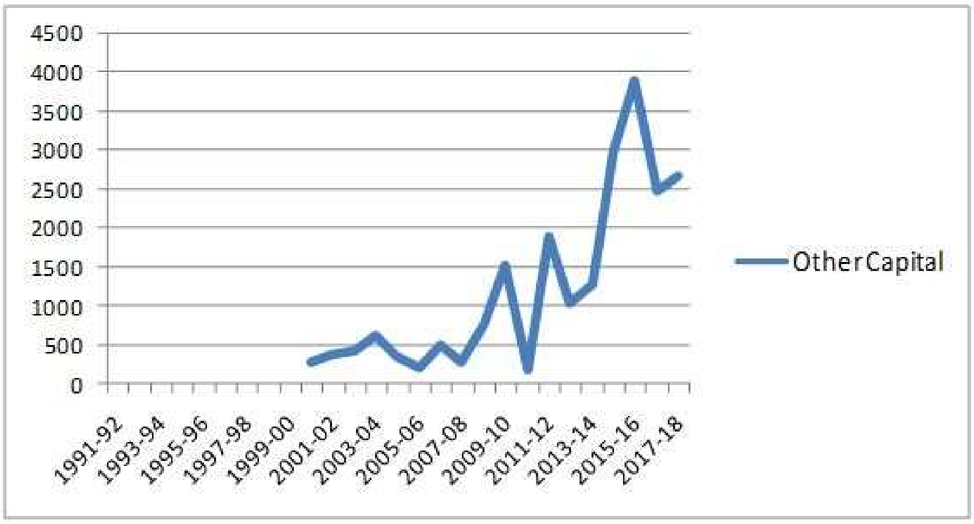

Figure 3.5: Flow of Foreign Direct Investment through Other Capital

Table 3.5 and Figure 3.5 present the flow of foreign direct investment through Other Capital, which was started in the year 2000-01. It increased from $280 million in 2000-01 to $2692 million in 2017-18. Though percentage of contribution of Other Capital to total FDI was above 6% in 2000-01, that is in the

Table 3.5: Flow of FDI through Other Capital (US $ Million)

Year	Other Capital	Total FDI	Percentage of Contribution of Other Capital to Total FDI	Annual Growth Rate of Other Capital (%)
1991-92	-	129	0	0
1992-93	-	315	0	0
1993-94	-	586	0	0
1994-95	-	1343	0	0
1995-96	-	2143	0	0
1996-97	-	2842	0	0
1997-98	-	3562	0	0
1998-99	-	2480	0	0
1999-00	-	2167	0	0
2000-01	280	4031	6.94	0
2001-02	390	6125	6.36	39.29
2002-03	438	5036	8.69	12.31
2003-04	633	4322	14.64	44.52
2004-05	369	5987	6.16	-41.71
2005-06	226	8901	2.53	-38.75
2006-07	517	22739	2.27	128.76
2007-08	292	34728	0.84	-43.52
2008-09	777	41737	1.86	166.1
2009-10	1535	33109	4.63	97.55
2010-11	191	29029	0.65	-87.56
2011-12	1914	39952	4.79	902.09
2012-13	1041	26953	3.86	-45.61
2013-14	1296	30763	4.21	24.5
2014-15	2997	35283	8.49	131.25
2015-16	3906	44907	8.69	30.33
2016-17	2489	42215	5.89	-36.28
2017-18	2692	39430	6.82	8.15
Total	**21983**	**463814**		

Source: Compiled from Handbook of Statistics on Indian Economy

starting year, it reduced to 2.27% in 2006-07 and 0.84% in 2007-08. From this major blow it could not recover yet, now in 2017-18 its contribution to FDI has become 6.82%. It has recorded only compound annual growth rate of 13 percent during the last eighteen years.

3.2.2 Foreign Direct Investment Trends in India

The 1990s witnessed an unprecedented growth of global foreign direct investment. It made foreign direct investment an important and vital component of development strategy in developed as well as developing countries. Ever since policies began to be designed around the world in order to stimulate foreign direct investment flows. In fact, foreign direct investment provides a win-win situation to both the host and home countries. Since India being a developing and capital scarce country she is in need of capital to meet her requirements related to the eradication of poverty, development of health, employment opportunities, education, technology etc. Hence India also participated in the race for foreign direct investment and had taken several steps to attract foreign direct investment inflows and thereby to boost the economy. As a result foreign direct investment began to flow into India. This evident from the Table 3.6.

Table 3.6 shows the growth of foreign investment in India through foreign direct investment from 1991 to 2018. It shows that foreign direct investment which was \$129 million in the year 1991-92, increased to \$39430 million in 2017-18. However, there has been inconsistency in the growth rate of foreign direct inflows. Its growth rate was positive till the end of 1997-98, but there after it was negative in 1998-99, 1999-00, 2002-03 and 2003-04. In 2004-05 and 2005-06 the foreign direct investment witnessed further increases with a growth rate of 38 and 48 percent respectively and the invested amount increased from \$5987 million to \$8901 million (refer Figure 3.6).

In the year 2006-07, FDI registered the highest growth rate i.e., 155 percent. The same year witnessed the highest growth rate in Indian economy too i.e., 9.6 GDP growth rate. In the year 2007-08 this trend of growth of foreign direct investment continued with an investment amounting to \$34728 million indicating a growth rate of 52 percent. But 2008-09 that is in the year of global financial recession the growth rate declined to the level of 20 percent along with the decline of the growth rate of the economy indicating a strong correlation between foreign direct investment and growth of the Indian economy. The growth rate of foreign direct investment became negative again during 2009-10 and 2010-11 and it touched a low the growth rate 20 percent with an amount of \$33109 million and 12 percent with an amount of \$29029 million respectively. Stable

Table 3.6: Net FDI Inflows into India

Year	Net FDI Inflow (US $ Million)	Annual Growth Rate of FDI (US $ Million)	Net FDI Inflow (Rs. Billion)	Annual Growth Rate of FDI (Rs. Billion)
1991-92	129	-	3.29	-
1992-93	315	144.18	9.59	191.48
1993-94	586	86.03	18.37	91.55
1994-95	1343	129.18	42.16	129.5
1995-96	2143	59.56	72.16	71.15
1996-97	2842	32.61	100.93	39.86
1997-98	3562	25.33	131.93	30.71
1998-99	2480	-30.37	103.88	-21.26
1999-00	2167	-12.62	93.96	-9.54
2000-01	4031	86.01	184.04	95.87
2001-02	6125	51.94	292.45	58.9
2002-03	5036	-17.77	243.97	-16.57
2003-04	4322	-14.17	198.3	-18.71
2004-05	5987	38.52	269.47	35.89
2005-06	8901	48.67	394.57	46.42
2006-07	22739	155.46	1026.52	160.16
2007-08	34728	52.72	1374.34	33.88
2008-09	41737	20.18	1907	38.75
2009-10	33109	-20.67	1578.19	-17.24
2010-11	29029	-12.32	1323.58	-16.13
2011-12	32952	13.51	1549.61	17.07
2012-13	26953	-32.53	1469.54	-5.16
2013-14	30763	14.13	1868.3	27.13
2014-15	35283	14.69	2158.93	15.55
2015-16	44907	27.27	2942.58	36.29
2016-17	42215	-5.99	2832.92	-3.72
2017-18	39430	-6.5	2539.77	-10.34
Total	**463814**	**847.05**	**24730.35**	**1001.49**

Source: Compiled from Handbook of Statistics on Indian Economy

political environment and responsive administrative setup, well established judiciary to enforce the rule of law, the world's largest democracy with 1.3 billion people, land of abundant natural resources, diverse climatic conditions, investor friendly policies and incentive based schemes, cost competitiveness, low labor cost, total labor force of nearly 530 million, large pool of skilled manpower, huge untapped market potential, full current account convertibility, reduction in import tariffs, robust banking and financial institutions and macroeconomic stability conditions etc. are generally believed to be the reasons for the massive

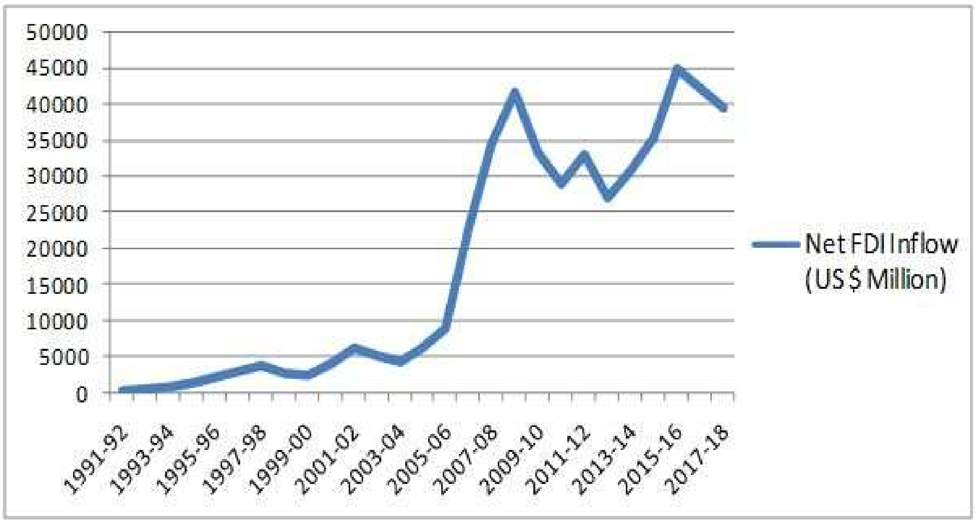

Figure 3.6: Net FDI Inflows into India

flow of foreign direct investment into India.

3.2.3 Major Foreign Direct Investors in India

The quantity of foreign direct investment in India is reflected in the number of countries making direct investment in India. Their number has risen from 15 countries in 1991 to 135 countries in 2018[146]. However, among them six countries i.e., Mauritius, Singapore, United Kingdom, Japan, Netherlands and USA enjoy the top position with Mauritius at the apex as can be seen in Figure 3.7. Since the increase in the number of FDI investors occurred after the liberalization the reason for this increase can be attributed to the liberalization. Figure 3.7 shows that the contribution of Mauritius is the highest i.e., 33 percent of total FDI in India and the reason for this is because of the double taxation avoidance agreement between Mauritius and India[147]. Singapore comes next to Mauritius with 19 percent of total FDI in India. Thus Mauritius and Singapore stand high above in their total investment in India when compared to other countries. The combined contribution of USA and UK in FDI investment in India is below 15 percent indicating an insignificant role of the great economic

[146] FDI Statistics, DIPP

[147] As a result of the a Double Taxation Avoidance Agreement between India and Mauritius, Mauritian companies investing need not pay tax in India. Therefore large number of firms (even some dummy companies) invested in India via Mauritius where there is only low rate of taxation.

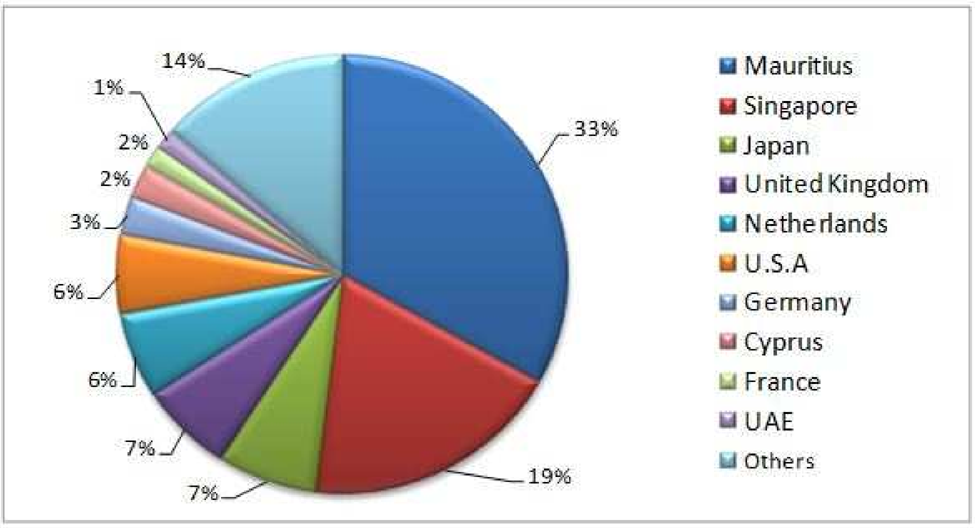

Figure 3.7: Country-Wise FDI Flows during the Period 2000-2018

powers in the foreign direct investment in India.

3.2.4 FDI Favored Sectors of the Indian Economy

India emerged as one of the most favored destination for foreign direct investment. However all the sectors of the economy did not receive equal patronage by the foreign direct investors. Certain sectors like service sector, telecommunication sector, computer hardware and software, construction development, automobile industry, drugs and pharmaceuticals etc. are the most favored sectors of Indian economy by the foreign direct investors. According to the FDI Statistics Report of the DIPP, the most desired sector with highest FDI inflow is the service sector which mainly consists finance, banking, insurance etc. The foreign direct investment inflow to different sectors during the period 2000 to 2018 is shown in the Figure 3.8. It shows that service sector ranks the top with 18% of total FDI inflows, computer software and hardware and telecommunication sector follows with 8% each, and then comes by construction and development, trading and automobile sector. Foreign investment, like all other forms of investment is also driven by profit motive. Hence the basic reason for this sectoral preferences, is related to profit making factors like low wages, wide demand supply gap etc. Of course the restrictions imposed by the government for foreign direct investment in certain sectors also keep these

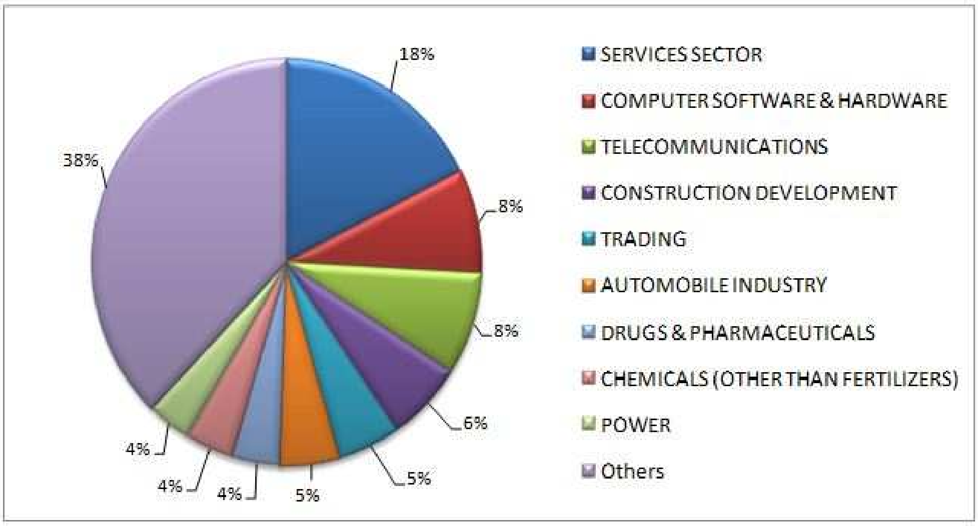

Figure 3.8: Sector-Wise FDI Inflows During the Period 2000-2018

sectors unattractive for foreign direct investment. The sectoral preference for foreign direct investors causes not only the uneven economic growth but also the marginalization of certain sectors like small scale and cottage industries and even agriculture to a very great extent.

3.2.5 FDI Favored Regions and States in India

As in the case of different sectors of the Indian economy, different regions and states of the Indian union do not receive equal attraction from the foreign direct investors. Certain regions like Mumbai, New Delhi[148] occupy the center of attraction for foreign direct investors. Similarly certain states like Delhi, Maharashtra, Karnataka and Tamil Nadu have attracted maximum FDI. Table 3.7 and Figure 3.9 will further substantiate this. It can also be seen that more than 45 percentage of total FDI flows are concentrated in the Mumbai and New Delhi regions.

Other share of the FDI inflows are scattered all over India with single digit percentage of contribution - Chennai region with 7 percent, Bangalore 6%, Ahmedabad 4%, Hyderabad 4% and Kolkata 1%. The FDI inflow in Kochi, Jaipur, Bhopal, Patna and Guwahati are very insignificant and the combined contribution to the total FDI inflow is less than 2 percent. Thus it is very

[148]Regional division is based on RBI's division of the regions.

clear that the most FDI favored Indian region is Mumbai region (Maharashtra Economy) approximately with Rs.339592 Crores or $70953 million and this region witnessed tangible FDI impacts especially in technological development.

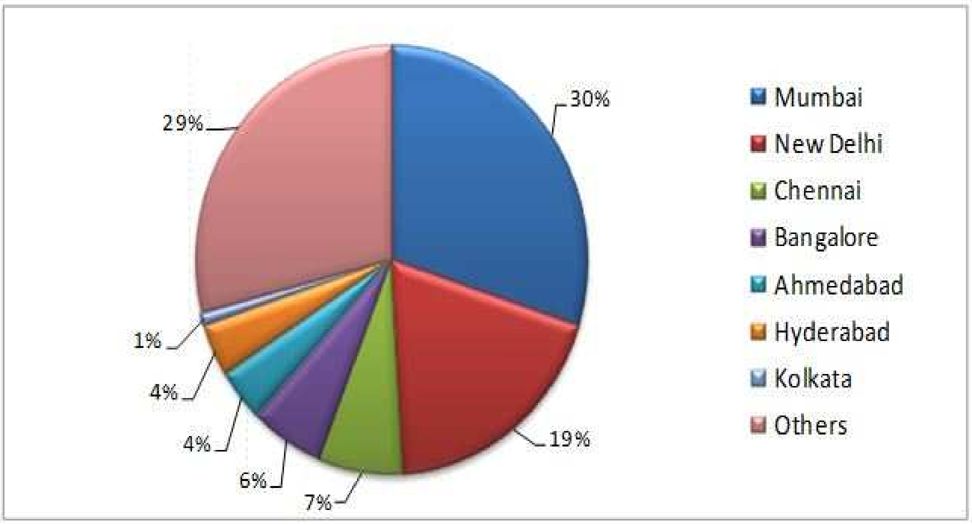

Figure 3.9: Region-Wise Distribution of FDI Inflows during the Period 2000-2018

The universal reasons for the emergence of industrial centers such as business-friendly environment, excellence in infrastructure, highly-skilled and trained workforce, effective policies in the industrial units, easy access to transport and communications, availability of natural resources etc. are the major motivating factors for the concentration of FDI investment in certain regions in India also. Besides these it should be noted that FDI friendly policies of certain regional governments also play a major role in this aspect.

So far the government has no say in this uneven distribution of FDI in India. That is the above mentioned uneven distribution of FDI is not the result of the discriminatory policies of the government. This is the major defect of FDI policy and it points to the urgency of a FDI policy targeting the promotion of industrially backward regions. This regional preference of FDI not only causes the uneven development of the regions and states of the Indian union but also widens the existing gap between them leading to regionalism and national disintegration.

Table 3.7: Region-Wise and State-Wise FDI Inflows during the Period 2000-2018

No.	RBI's Regional Division	States Covered	Cumulative FDI Inflows (in terms of US$ Million)	Percentage to Total FDI Inflows
1	Mumbai	Maharashtra, Dadra & Nagar Haveli, Daman & Diu	339,552 (70,953)	30
2	New Delhi	Delhi, Part Of UP and Haryana	229,013 (46,195)	19
3	Chennai	Tamil Nadu, Pondicherry	82,387 (15,990)	7
4	Bangalore	Karnataka	73,052 (14,661)	6
5	Ahmedabad	Gujarat	48,698 (10,221)	4
6	Hyderabad	Andhra Pradesh	48,079 (9,828)	4
7	Kolkata	West Bengal, Sikkim, Andaman & Nicobar Islands	14,361 (2,938)	1
8	Chandigarh‘	Chandigarh, Punjab, Haryana, Himachal Pradesh	6,357 (1,330)	0.6
9	Jaipur	Rajasthan	6,785 (1,263)	0.5
10	Bhopal	Madhya Pradesh, Chattisgarh	6,095 (1,215)	0.5
11	Kochi	Kerala, Lakshadweep	5,369 (1,085)	0.5
12	Panaji	Goa	3,863 (822)	0.3
13	Kanpur	Uttar Pradesh, Uttranchal	2,177 (440)	0.2
14	Bhubaneshwar	Orissa	1,957 (397)	0.2
15	Guwahati	Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura	361 (80)	0
16	Patna	Bihar, Jharkhand	252 (48)	0
17	Jammu	Jammu & Kashmir	26 (4)	0
18	REGION NOT INDICATED			26.2
SUB. TOTAL			**121,907 (22,424)**	**100**

Source: Compiled from FDI Statistics, DIPP

3.3 Foreign Portfolio Investment (FPI) in India

Besides direct investment by foreign countries in India, the non-residents of the country too are making huge investments in Indian securities including shares, government bonds, corporate bonds, convertible securities, infrastructure securities etc. Such investments are known as foreign portfolio investments and the class of investors who make investment in these securities, as foreign portfolio investors. Securities and Exchange Board of India (SEBI) is mainly in charge of such investments and it makes necessary regulations related to foreign portfolio investment from time to time. As per the regulations of SEBI a nonresident investor is not allowed to invest not more than ten percent of the paid up capital of an Indian company. Similarly the total amount of such investments should not exceed 24 percent of the paid up capital of the company and they are not allowed to invest in unlisted shares. SEBI gives registration for Foreign Institutional Investors (FIIs) for five years for the first time subject to their subsequent renewal.

Foreign portfolio investment in India has three components. That is FPI comes to India through three channels namely, (a) Foreign Institutional Investment (FII) (b) Global Depository Receipts (GDRs) and American Depository Receipts (ADRs) and (c) Offshore Funds.

3.3.1 Foreign Institutional Investors (FIIs) in India

The star of the foreign portfolio investment show is the foreign institutional investment[149]. After the initial years of shyness FIIs began to play a spectacular show not only in the FPI and the Indian capital market but also in the economy of the country as a whole. In tune with the patronising and blessing attitude of the government by way of favourable policy changes year after year, more and more FIIs are appearing in the Indian economy. Consequently flooding of

[149]Foreign Institutional Investment (FII) means investment by financial institutions of one country in another country for the primary purpose of making capital gains and foreign Institutional Investors (FIIs) are investors or investment funds that is from or registered in a country outside of the one in which it is currently investing.

capital flow to the capital market which had a humble beginning of $1 million in 1992, reached a zenith $22165 million in 2018. Similarly one can also see an almost consistent increase in the number of FIIs registered in India. The most vibrant foreign investors in India are HSBC, CLSA, City Group and Merrill Lynch. Other FIIs which have significant exposure to Indian equities are Crown Capital, Fidelity, Goldman Sachs, Morgan Stanley, UBS, Trowe Price International, Capital International and ABN AMRO.

Table 3.8: SEBI Registered FIIs in India

Year	No. of FIIs Registered	Net Additions in FIIs During the Year
1992-93	0	0
1993-94	3	3
1994-95	156	153
1995-96	353	197
1996-97	439	86
1997-98	496	57
1998-99	450	-46
99-2000	506	56
2000-01	527	21
2001-02	490	-37
2002-03	502	12
2003-04	540	38
2004-05	685	145
2005-06	882	197
2006-07	997	115
2007-08	1319	322
2008-09	1635	316
2009-10	1713	78
2010-11	1722	9
2011-12	1765	43
2012-13	1757	-8
2013-14	1710	-47
2014-15	1730	20
2015-16	1750	20
2016-17	1767	17
2017-18	1775	8

Source: Compiled from Indian Securities Market: A Review, NSE

Table 3.8 and Figure 3.10 give the number of the FIIs registered in India from 1992 to 2018. It shows that though FIIs were permitted in India in 1992-93 none of them registered in that year under the SEBI. Three FIIs were registered

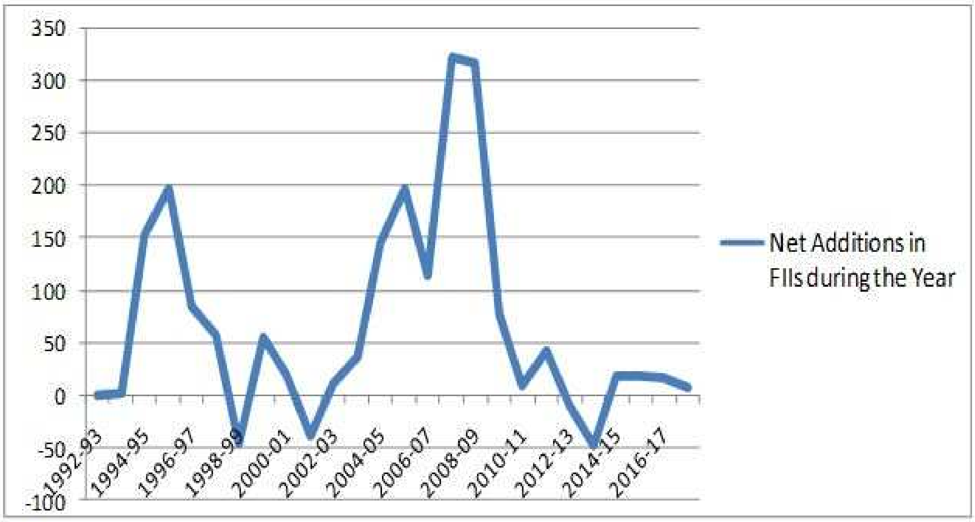

Figure 3.10: Annual Net Additions in FIIs during the Period 1991-2018

in 1993-94 and by 1994-95 their number increased to 156, in 1995-96 to 353, in 1996-97 to 439 and in 1997-98 to 496. Though their number decreased from 496 to 450 in 1998-99, in the next two years their number again increased to 506 and 527 respectively. In 2001-02 also their number once again showed a decline and fell to 490. However from 2002-03 onwards their number witnessed a consistent growth and by 2017-18 the total number of FIIs registered in India came to 1775.

Besides the introduction of several measures by SEBI and RBI - allowing overseas pension funds, mutual funds, investment trusts, asset management companies, institutional portfolio managers, universal funds, endowments, easing the norms for registration of FIIs, reducing procedural delays, lowering the fees of registration, mandating strict disclosure norms, improved regulatory mechanisms etc. the fundamental strength of the economy also made India as one of the attractive destinations for FIIs. The decrease for the number of FIIs in India was due to the fact that FIIs registration was then restricted to 5 years and it had to be renewed.

3.3.2 Foreign Institutional Investment (FII) in India

Foreign institutional investors have been playing a significant role in the Indian capital market. They are investing huge amounts in equities and have become the main source of foreign portfolio investment in India as shown in Table 3.9 and Figure 3.11.

Table 3.9: Foreign Institutional Investment in India (US $ Million)

Year	FII	Total FPI	Percentage of Contribution of FII to Total FPI	Annual Growth Rate of FII	Cumulative Growth of FII
1991-92	-	4	-	0	0
1992-93	1	244	0.41	25	1
1993-94	1665	3567	46.68	681.96	1666
1994-95	1503	3824	39.3	-4.54	3169
1995-96	2009	2748	73.11	13.23	5178
1996-97	1926	3312	58.15	-3.02	7104
1997-98	979	1828	53.56	-28.59	8083
1998-99	-390	-61	-	-74.89	7693
99-2000	2135	3026	70.56	647.43	9828
2000-01	1847	2760	69.92	-9.51	11675
2001-02	1505	2021	74.47	-12.39	13180
2002-03	377	979	38.51	-55.81	13557
2003-04	10918	11377	95.97	1076.71	24475
2004-05	8686	9315	93.25	-19.61	33161
2005-06	9926	13492	79.46	13.31	43087
2006-07	3225	7003	46.05	-49.66	46312
2007-08	20328	27271	74.54	244.22	66640
2008-09	-15017	-13855	-	-129.6	51623
2009-10	29048	32376	89.72	-318.04	80671
2010-11	29422	31471	93.48	1.155	110093
2011-12	16813	17410	96.57	-42	126906
2012-13	27582	27769	99.3	64.05	154488
2013-14	5009	5029	99.6	-81.61	159497
2014-15	40923	42193	96.99	716.98	200420
2015-16	-4016	-3643	110.23	-109.81	196404
2016-17	7766	7766	100	-293.37	204170
2017-18	22165	22165	100	185.41	226335
Total	**226335**	**261391**			

Source: Compiled from Handbook of Statistics on Indian Economy

It shows almost consistent growth in foreign institutional investment and its contribution to the total portfolio flows which was only 0.41 percent in 1992-93 increased to 100 percent in 2017-18. However foreign institutional investment became negative in 1998-99, 2008-09 and 2015-16. The East Asian Crisis, Global Financial Crisis and Brexit are believed to be the factors responsible for this decline of foreign institutional investment in India. The compound

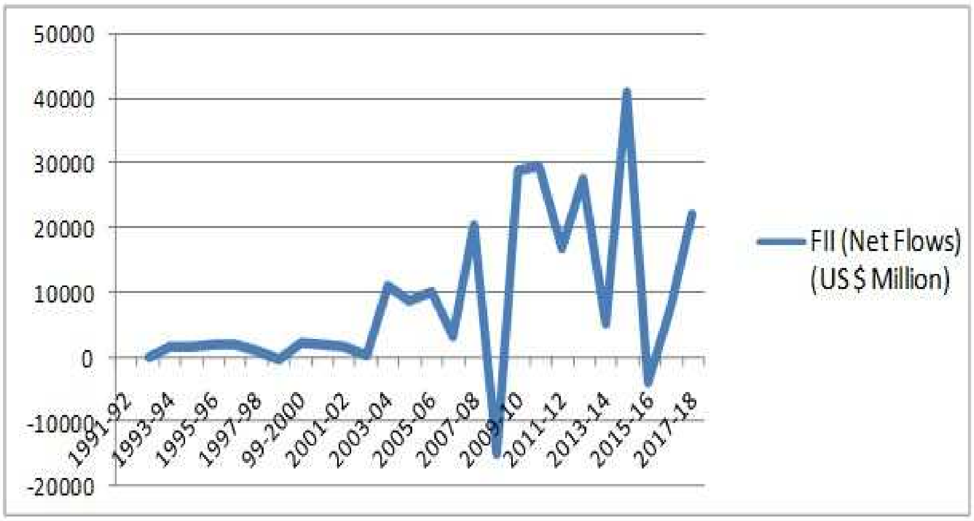

Figure 3.11: Trend of Foreign Institutional Investment in India

annual growth rate of foreign institutional investment in India is 49.21 percent.

3.3.3 Domains of Foreign Institutional Investment - Equity and Debt

Though FIIs were allowed to invest in the Indian capital market from September 1992 onwards they are allowed to invest only in two areas or domains of the capital market i.e., Equity and Debt. Though the FIIs were allowed to invest in debt market in 1998, they began to invest only in 1999. Their investment pattern since 1999 in Equity and Debt is presented in Table 3.10.

The Figure 3.12 shows that major portion of FII flows are into the equity market. It is seen that FII flows to debt market have only increased in recent years. In other words out of the total cumulative foreign institutional investment, 74 percent of investment is in equity and only 26 percent in the debt market. It was in 2014-15 the FIIs made their highest investment in equity and debt that year they invested Rs.111333 Crores in equity and Rs.166127 Crores in debt. The year 2008-09 witnessed the lowest FIIs investment in equity and 2013-14 witnessed their lowest amount of investment in debt. The explicit reason for the former is the financial crisis of 2008-09. Foreign institutional investment in the debt market is witnessing a gradual increase in recent years.

Table 3.10: Net FII in Equity and Debt (Rs. in Crores)

Year	Net FII in Equity	Net FII in Debt	Total FII
1999-00	9669	452	10121
2000-01	10207	-274	9933
2001-02	8072	690	8762
2002-03	2527	162	2689
2003-04	39960	5805	45765
2004-05	44123	1759	45882
2005-06	48801	-7334	41467
2006-07	25236	5605	30841
2007-08	53404	12775	66179
2008-09	-47706	1895	-45811
2009-10	110220	32438	142658
2010-11	110121	36317	146438
2011-12	43738	49988	93726
2012-13	140033	28334	168367
2013-14	79708	-28061	51647
2014-15	111333	166127	277460
2015-16	-14172	-4004	-18076
2016-17	55703	-7292	48411
Total	**830977**	**295382**	**1126459**

Source: Compiled from Indian Securities Market: A Review, NSE

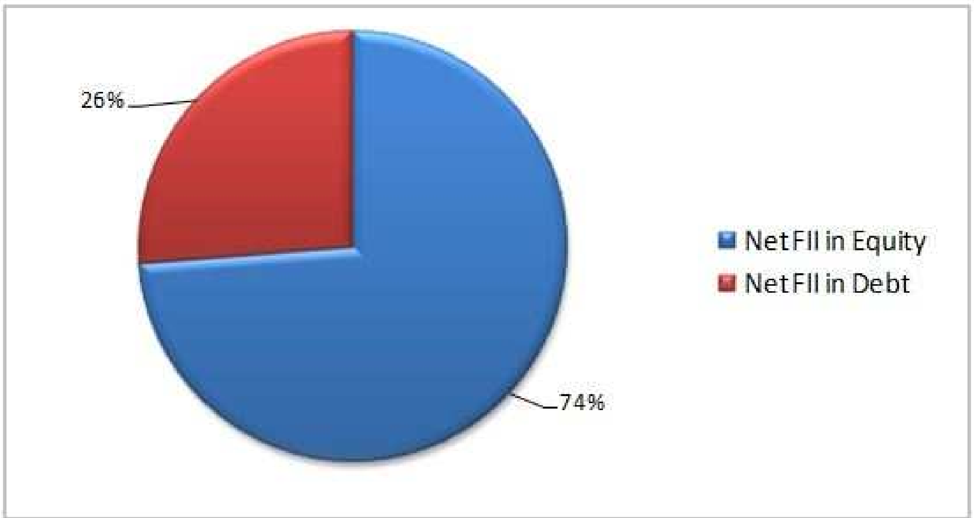

Figure 3.12: Net Foreign Institutional Investment in Equity and Debt

3.3.4 Global Depository Receipts (GDRs) and American Depository Receipts (ADRs)

The second component or channel of FPI is American Depositary Receipt (ADR)[150] and Global Depositary Receipt (GDR)[151] which are usually listed

[150] An American Depositary Receipt (ADR) is a negotiable certificate issued by a U.S. bank representing a specified number of shares (or one share) in a foreign stock traded on a U.S. exchange.

at NYSE, AMEX or Nasdaq and Luxembourg Stock Exchange respectively. The positive responses given by the FIIs to the Indian capital market are reflected in their response to the GDR/ADR issued by Indian companies also. The first GDR listing was in 1992 by Reliance Industries Ltd. In course of time several companies followed their example and by 2018 their total number became 72. The flow of ADRs/GDRs investment in the Indian capital market is presented in the Table 3.11 and Figure 3.13.

Table 3.11: Flow of GDRs/ADRs Investment into India during the period 1991-2018

Year	GDRs/ADRs (US $ Million)	Total FPI (US $ Million)	Percentage of Contribution of GDRS/ADRs to Total FPI	Annual Growth Rate of GDRs/ADRs	Cumulative Growth of GDRs/ADRs
1991-92	0	4	-	0	0
1992-93	240	244	98.36	0	240
1993-94	1520	3567	42.61	533.33	1760
1994-95	2082	3824	54.44	36.97	3842
1995-96	683	2748	24.85	-67.19	4525
1996-97	1366	3312	41.24	100	5891
1997-98	645	1828	35.28	-52.78	6536
1998-99	270	-61	-	-58.13	6806
99-2000	768	3026	25.38	184.44	7574
2000-01	831	2760	30.1	8.2	8405
2001-02	477	2021	23.6	-42.59	8882
2002-03	600	979	61.28	25.78	9482
2003-04	459	11377	4.03	-23.5	9941
2004-05	613	9315	6.58	33.55	10554
2005-06	2552	13492	20.42	316.31	13106
2006-07	3776	7003	53.91	47.962	16882
2007-08	6645	27271	24.36	75.97	23527
2008-09	1162	-13855	-	-82.51	24689
2009-10	3328	32376	10.2	186.4	28017
2010-11	2049	31471	6.5	-38.43	30066
2011-12	597	17410	3.4	-70.86	30663
2012-13	187	27769	0.6	-68.67	30850
2013-14	20	5029	0.3	-89.3	30870
2014-15	1271	42193	3.01	6255	32141
2015-16	373	-3643	-	-70.65	32514
2016-17	0	7766	-	-	32514
2017-18	0	22165	-	-	32514
Total	**32514**	**261391**			

Source: Compiled from Handbook of Statistics on Indian Economy

[151] Global Depository Receipt (GDR) is used to offer Indian shares in any other country other than the US

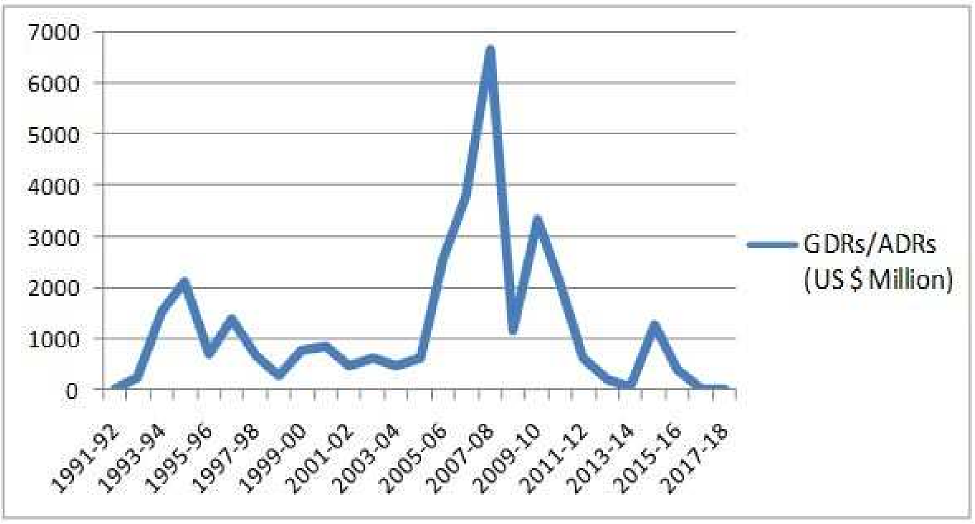

Figure 3.13: Trend of GDRs/ADRs Flows to India

GDRs/ADRs issuance, which is an excellent way to buy shares in a foreign company by realizing dividends and capital gains in U.S. dollars, reached a peak in 2007 when global markets scaled new height. However they began to decline gradually, mainly because of the currency and economic risks for the underlying shares in another country, especially since the global economic slowdown of 2008-09. Gradually it witnessed a revival along with the global economic and financial rebound and more GDR listed companies emerged. However the initial interest especially during 1992 to 1995 given to GDR was not sustained. Their contribution to the cumulative portfolio investment of $261391 million was only 12 percent of total foreign portfolio investment. The compound annual growth rate of GDR/ADR is 1.93 percent.

3.3.5 Offshore Funds

When compared to other two channels/components of foreign portfolio investment Offshore Funds is an insignificant player as can be seen from Table 3.12 and Figure 3.14. After an initial flow of Offshore Funds, they began to decline steadily and finally reached negative. If the total flow of Offshore Funds in the year 1991 was $4 million, next year i.e., in 1992-93 it declined to $3 million. Nevertheless it witnessed a considerable increase in 1993-94 and 1994-95 to $382 million and $239 million respectively. Since then it began to decline except during two years i.e., in 1997-98 with a flow of $204 million and 2007-08 with a flow of $298 million, and finally came to an end.

Table 3.12: Flow of Offshore Funds to India during the period 1991-2018 (US $ Million)

Year	Offshore Funds	Total FPI	Percentage of Contribution of Offshore Funds to Total FPI	Annual Growth Rate of Offshore Funds	Cumulative Growth of Offshore Funds
1991-92	4	4	100	0	4
1992-93	3	244	1.2	-25	7
1993-94	382	3567	10.7	12633.33	389
1994-95	239	3824	6.25	-37.43	628
1995-96	56	2748	2.03	-76.56	684
1996-97	20	3312	0.6	-64.28	704
1997-98	204	1828	11.15	920	908
1998-99	59	-61	-	-71.07	967
99-2000	123	3026	4.06	108.47	1090
2000-01	82	2760	2.9	-33.33	1172
2001-02	39	2021	1.9	-52.43	1211
2002-03	2	979	0.2	-94.87	1213
2003-04	-	11377	-	-100	1213
2004-05	16	9315	0.17	0	1229
2005-06	14	13492	0.11	-12.5	1243
2006-07	2	7003	0.02	-85.714	1245
2007-08	298	27271	0.01	14800	1543
2008-09	-	-13855	-	-100	1543
2009-10	-	32376	-	0	1543
2010-11	-	31471	-	0	1543
2011-12	-	17410	-	0	1543
2012-13	-	27769	-	0	1543
2013-14	-	5029	-	0	1543
2014-15	-	42193	-	0	1543
2015-16	-	-3643	-	0	1543
2016-17	-	7766	-	0	1543
2017-18	-	22165	-	0	1543
Total	**1543**	**261391**			

Source: Compiled from Handbook of Statistics on Indian Economy

The total Offshore Funds so far reached in India is $1543 million i.e., only one percent of the total FPI inflows. Thus it can be seen that the portfolio investment through the Offshore Funds route has been negligible when compared to other two forms of foreign portfolio investment. The highest investment through this route was in 1997-98 and at that time it was 11.15% of the total

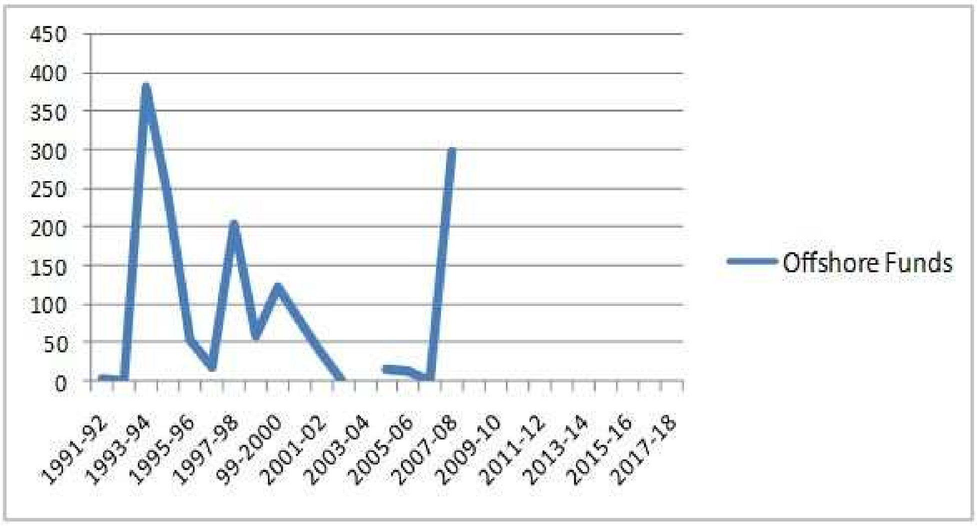

Figure 3.14: Trend of Offshore Funds in India

foreign portfolio investment. But after 2008-09 it ceased to play any significant role in portfolio investment. Out of the cumulative portfolio investment, the contribution of Offshore Funds was only one percent and its compound annual growth rate is 30.92 percent.

As in the case of GDRs/ADRs the main reason for the decline of Offshore Funds in India are the global economic recessions and continuances of the regulations related to Offshore Funds contrary to the case in the foreign institutional investment. The limited number of Offshore Funds available for subscription by the general public also contributed its decline in India.

3.3.6 Components of Foreign Portfolio Investment Contribution in India

As already seen foreign portfolio investment flows to the Indian capital market are through three components or channels i.e., through FIIs, Global Depository Receipts (GDRs)/ American Depository Receipts (ADRs) and Offshore Funds. FPI in India began with Offshore Funds. Portfolio investment by FIIs and Global Depository Receipts (GDRs), American Depository Receipts (ADRs) has begun only in 1992-93, two years after the liberalization of capital flows. In course of time FIIs eclipsed the other two channels or components of FPI.

Table 3.13: Components of FPI Contribution in India (US $ Million)

Year	GDRs/ ADRs	FII	Offshore Funds	Total FPI
1991-92	-	-	4	4
1992-93	240	1	3	244
1993-94	1520	1665	382	3567
1994-95	2082	1503	239	3824
1995-96	683	2009	56	2748
1996-97	1366	1926	20	3312
1997-98	645	979	204	1828
1998-99	270	-390	59	-61
99-2000	768	2135	123	3026
2000-01	831	1847	82	2760
2001-02	477	1505	39	2021
2002-03	600	377	2	979
2003-04	459	10918	-	11377
2004-05	613	8686	16	9315
2005-06	2552	9926	14	12492
2006-07	3776	3225	2	7003
2007-08	6645	20328	298	27271
2008-09	1162	-15017	-	-13855
2009-10	3328	29048	-	32376
2010-11	2049	29422	-	31471
2011-12	597	16813	-	17410
2012-13	187	27582	-	27769
2013-14	20	5009	-	5029
2014-15	1271	40923	-	42193
2015-16	373	-4016	-	-3643
2016-17	0	7766	-	7766
2017-18	0	22165	-	22165
Total	**32514**	**226335**	**1543**	**261391**

Source: Compiled from Handbook of Statistics on Indian Economy

Table 3.13 shows the beginning of foreign portfolio investment in India with the Offshore Funds and by 1992-93 the other two i.e., FII and GDRs/ARDs appeared in the seen and the combined contribution of these three components became $244 million in that year. After 1993-94 portfolio flows began to pick up consistently and reached its peak in 2014-15 i.e., $42193 million. But unlike the other years in 1998-99-the year of East Asian Currency Crisis - portfolio investment became negative i.e., in that year instead of inflows, $61 million was withdrawn from the capital market. During two other occasions also FPI inflows exhibited decline i.e., in 2002-03. In that year it witnessed a drastic decline to an

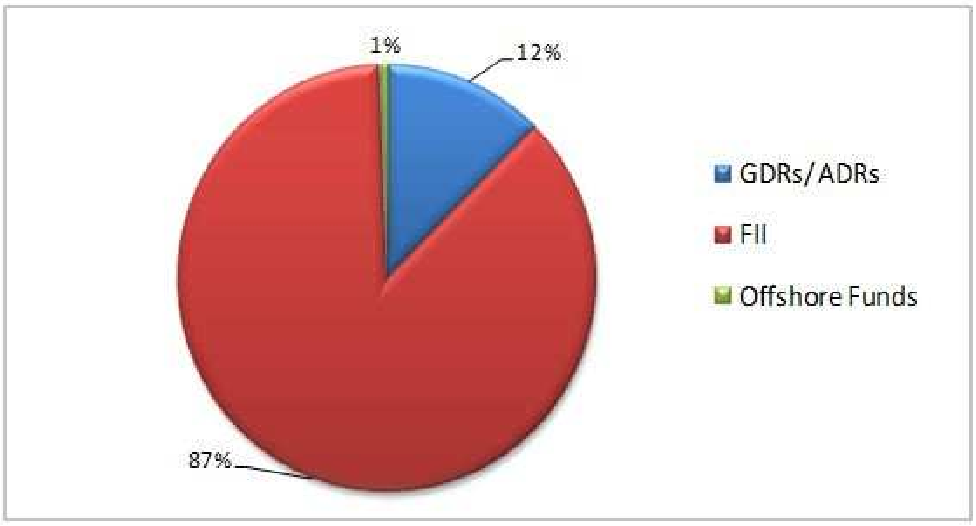

Figure 3.15: Contribution of the Components of FPI to the Total FPI Flows

amount of $979 million and during 2008-09 - the year of global financial crisis - it once again became negative i.e., $13855 million was withdrawn from the capital market. In the year 2015-16, foreign portfolio investment became negative to the amount $3643 million. As shown in Figure 3.15 the cumulative portfolio investment in India reached $261391 million out of which FII contribution was 87 percent, GDRs/ADRs contribution 12 percent and the rest 1 percent through Offshore Funds.

3.3.7 Trends in Foreign Portfolio Investment in India

The Table 3.14 and Figure 3.16 show the trend of FPI in India during the post liberalization period. It shows that the FPI flows into India were almost stagnant from 1991 to 2003. But since 2003 FPI flows began to withness consistent and sharp increases except during two occasions i.e., in 2008-09 and 2015-16 because of the global financial crisis and brexit respectively. By 2018 the total FPI flows reached a gigantic amount i.e., $261391 million and the out of the total foreign investment of $725205 million the share of the FPI became 36 percent. In short now the FPI has become a competing partner of foreign investment in India with annual compound growth rate of 39.31 percent.

Table 3.14: Net Foreign Portfolio Investment Flows

Year	FPI (Rs. in Billion)	Annual Growth Rate of FPI	FPI (US $ Million)	Annual Growth Rate of FPI
1991-92	0.1	-	4	-
1992-93	7.4	7300	244	6000.00
1993-94	114.45	1446.62	3567	1361.89
1994-95	112.34	-1.8436	3824	7.20
1995-96	90.96	-19.032	2748	-28.14
1996-97	117.35	29.0128	3312	20.52
1997-98	67.68	-42.326	1828	-44.81
1998-99	-21.9	-132.36	-61	-103.34
99-2000	131.05	-698.4	3026	-5060.66
2000-01	126.12	-3.7619	2760	-8.79
2001-02	96.16	-23.755	2021	-26.78
2002-03	46.75	-51.383	979	-51.56
2003-04	518.98	1010.12	11377	1062.10
2004-05	414.19	-20.192	9315	-18.12
2005-06	553.57	33.6512	13492	44.84
2006-07	316.3	-42.862	7003	-48.10
2007-08	1183.48	274.164	27271	289.42
2008-09	-642.06	-154.25	-13855	-150.80
2009-10	1538.85	-339.67	32376	-333.68
2010-11	1446.8	-5.9817	31471	-2.80
2011-12	897.45	-37.97	17410	-44.68
2012-13	1512.51	68.5342	27769	59.50
2013-14	311.03	-79.436	5029	-81.89
2014-15	2577.62	728.73	42193	738.99
2015-16	-238.22	-109.24	-3643	-108.63
2016-17	515.22	-316.27	7766	-313.18
2017-18	1424	177.35	22165	185.41
Total	**13218.18**		**261391**	

Source: Compiled from Handbook of Statistics of Indian Economy

3.4 Position of FDI and FPI in the Foreign Investment Arena of India

The analysis made so far reveals that both FDI and FPI are making competing contributions and almost equal roles in the foreign investment arena of India. In fact these two channels of foreign investment act as two arms of foreign investment in India, making it difficult to distinguish each other's role in the context of their contribution. Both FDI and FPI enjoy equal importance because they are making almost equal contribution to the foreign investment in India as can

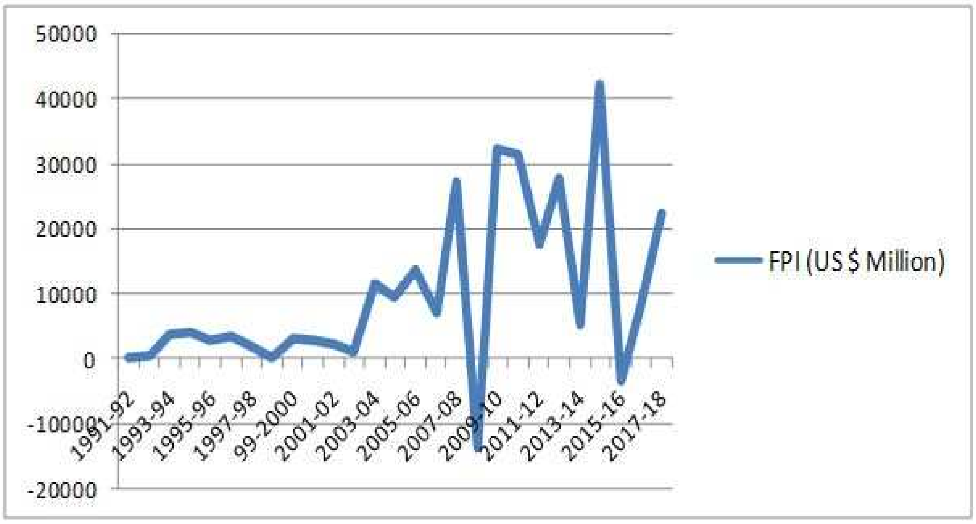

Figure 3.16: Net Flows of Foreign Portfolio Investment

be seen in the coming chapters. Here an account of their comparative flows to the total foreign investment in India is given in Table 3.15.

Figure 3.17 will further visualize this comparative contribution of the two channels of foreign investment - FDI and FPI - to the total foreign investment in India. That is 64 percent of the total foreign investment comes from FDI and only 36 percent comes from FPI. In other words out of the total $725205

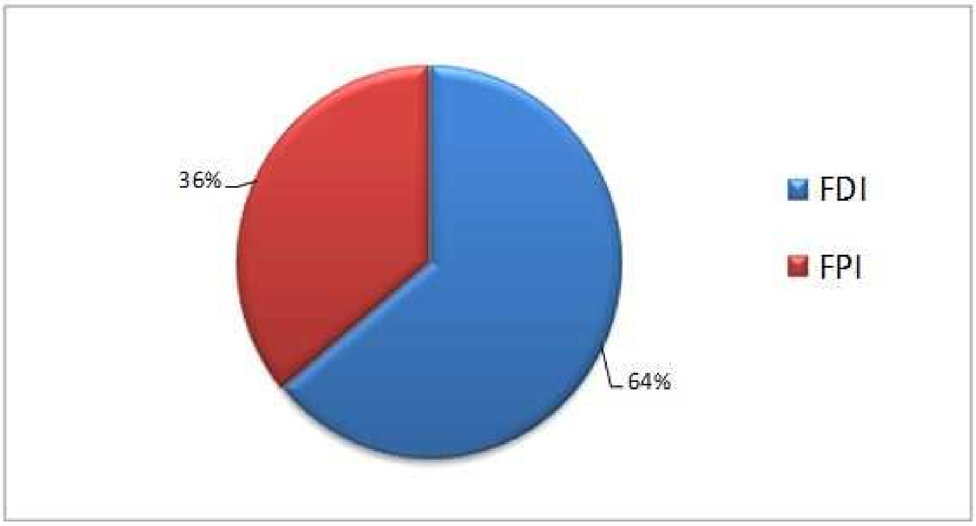

Figure 3.17: Contribution of FDI and FPI to the Total Foreign Investment in India

million foreign investment flows $463814 is by FDI and the rest i.e., $261391 million by the FPI. The difference in the total amount contributed by FDI and

Table 3.15: Position of FDI and FPI Flows in the Total Investment Flows to India (US $ Million)

Year	FDI	FPI	TOTAL
1991-92	129	4	133
1992-93	315	244	559
1993-94	586	3567	4153
1994-95	1343	3824	5167
1995-96	2143	2748	4891
1996-97	2842	3312	6154
1997-98	3562	1828	5390
1998-99	2480	-61	2419
99-2000	2167	3026	5193
2000-01	4031	2760	6791
2001-02	6125	2021	8146
2002-03	5036	979	6015
2003-04	4322	11377	15699
2004-05	5987	9315	15302
2005-06	8901	13492	22393
2006-07	22739	7003	29742
2007-08	34728	27271	61999
2008-09	41737	-13855	27882
2009-10	33109	32376	65485
2010-11	29029	31471	60500
2011-12	32952	17410	50362
2012-13	26953	27769	54722
2013-14	30763	5029	35792
2014-15	35283	42193	77476
2015-16	44907	-3643	41264
2016-17	42215	7766	49981
2017-18	39430	22165	61595
Total	**463814**	**261391**	**725205**

FPI is not as wide as it appears because the contribution made by the latter, though comparatively small, is more ‘liquid capital’ than by the contribution made by the former.

The discussion made in this chapter so far shows that India has become one of the major investment destinations of the world. Since this large scale of foreign investment occurred after liberalization, the prima facie reason for this appears to be liberalization. As liberalization process continues as an ongoing process without any major policy reversal so far, it can be assumed that government is satisfied with the foreign investment flows and its operation in the economy. It is true that there is disparity between the share of FDI and FPI in the total foreign investment as it is 64% and 36% respectively. The dominance of FDI in the foreign investment arena of India is a consoling fact as FDI is considered less harmful and more beneficial to the economy when compared to the FPI, which has been always associated with volatility and instability. But this difference in the share of contribution does not minimize the role of FPI as it has the potential to involve and impact directly and powerfully in the capital market and thereby the economy as a whole. However these aspects deserve to be scrutinized further. But prior to that it is necessary to probe what prompted the foreign investors to divert their investment flows into India in such a massive way. The coming chapter is devoted for this.

Chapter 4

Determinants of Foreign Investment in India

In the previous chapter it has been seen that a huge amount of foreign investment has been flowing to India. This unprecedented foreign investment in the last few decades is usually associated with and explained in terms of economic liberalization of India since 1990s. But this requires further scrutiny. Hence this chapter tries to find out the reasons for the massive foreign investment flows to India.

It is not correct to explain the determinants of foreign investment in India simply with the help of one or two factors or attributes. Of course liberalization and its allies might have played significant roles in attracting foreign investment in India. But had liberalization is the only factor, all the countries which are ready to liberalize their economies must have received positive responses from foreign investors. Hence it is clear that behind liberalization and the consequent inflow of foreign investments there are some intertwined factors which are the actual determinants of foreign investment. The ultimate determinant of foreign investment, like the case of almost all other types of investments, is also the return which the investment brings in the short or long run. But there are some other specific factors which push as well as pull foreign capital to the other countries. That is why the flow of foreign capital is not uniform in all countries. While the domestic conditions of the certain countries - lack of opportunities, unfavorable climate for investment, low return, low interest rate, political instability etc. push their capital to go out of the country, the encouraging situations of the host countries like political stability, fundamental strength of the economy, receptive policies of the government including liberalization and above all the possibility of high return pull the foreign capital to certain countries. But since some of these factors are qualitative in nature and hence non measurable they cannot be studied scientifically as determinants of foreign investment. However, they directly and indirectly create and influence certain quantitative and measurable factors especially the macroeconomic factors like inflation, exchange rate, growth rate, trade openness, balance of payments etc. which have the potential to influence the foreign investment. Therefore their potential to attract foreign investment into India and their short term and long term equilibrium relationship with foreign investment in India are analysed.

4.1 Factors Affecting Foreign Investment

As already seen scholars are not unanimous about the relative role of the factors which determine the foreign investment flows. However there is some consensus among them about the following factors which have the potential to attract foreign investment to a country.

1. **Inflation**

   Rate of inflation which is measured by the Wholesale Price Index (WPI), is a crucial factor influencing the inflow of foreign investment. Low inflation or price stability is one of the main indicator of a stable macroeconomic situation of a country. Akinboade et al. (2006)[152] state that low inflation is assumed to be a sign of internal economic stability in the host nation. A high rate of inflation signifies economic instability associated with inappropriate government policies, especially the monetary fiscal policy mix. Khan and Mitra (2014)[153] argue that high rate

[152] Akinboade, O.A., Siebrits, F.K., and Roussot, E.N. (2006). Foreign Direct Investment in South Africa, in Ajayi (ed.) Foreign Direct Investment in SubSaharan Africa - Origin, Targets, Impact and Potential. *Nairobi: African Economic Research Consortium*, 177-208.

[153] Khan, G.S., and Mitra,P. (2014). A Causal Linkage between FDI Inflows with Select Macroeconomic Variables in India - An Econometric Analysis. *IOSR Journal of Economics and Finance*, 5(5), 2321-5933.

of inflation distort the economic activities, contributing to lesser inflow of capital. It affects profitability as higher costs lead to lower earnings. Hence low inflation rate is desirable to attract foreign capital (Aijaz et, al 2014)[154].

Chingarande and Karambakuwa (2011)[155] hold the same view. According to them a stable economy attracts more FDI. Thus a low inflationary environment is desired in countries that promote FDI as a source of capital flow. But negative or high inflation rates i.e., above single digit will discourage investors due to lower rate of return in profits and hence the government should control and regulate inflation rate around levels that stimulate investment. Beacuse high level of price in the country results in rising cost of production, increase in input price: like wages, cost of raw material, land price and cost of capital leads to a high price of the product which in turn will adversely affect the domestic as well as international demand of the product. All these factors ultimately lead to the reduction in business profits and in turn discourages foreign investment in the countries having a high inflation rate. However a certain level of inflation, normally a single digit, is desirable to stimulate investment in an economy. Kaur and Dhillon (2010)[156] explored the determinants of foreign institutional investment in India. The study revealed that inflation in US has a positive influence whereas inflation in India has a negative influence on FII flows into India.

2. **Exchange Rate**

Exchange Rate (Nominal Effective Exchange Rate - NEER), the relative strength of the domestic currency in relation to the foreign currency, is closely related to foreign investment. According to Banga (2003)[157] volatility of exchange rate adversely affects foreign direct investment. High volatility of exchange rate indicates uncertainty regarding the fu-

[154]Aijaz, H., Siddiqui, A., and Aumeboonsuke, V. (2014). Role of Interest Rate in Attracting the FDI: Study on Asean 5 Economy. *International Journal of Technical Research*, 2(3), 59-70.

[155]Chingarande, A., Karambakuwa, T. (2011). The Impact of Interest Rates on Foreign Direct Investment: A Case Study of the Zimbabwean Economy, *International Journal of Management Sciences and Business Research*, 1(5), 2226-2236.

[156]Kaur, M., and Dhillon, S. (2010). Determinants of Foreign Institutional Investors Investment in India, *Eurasian Journal of Business and Economics*, 3(6), 57-70.

[157]Banga, R. (2003). *Impact of Government Policies and Investment Agreements on FDI Inflows*, Working Paper, No.116, Indian Council for Research on International Economic Relations, New Delhi.

ture economic and business activities of the host country. If the exchange rate of a country is highly volatile, foreign investors will be discouraged to invest in that country. Appreciation of the domestic currency will attract foreign investment especially FDI in different ways. If the FDI's objective is to serve the host country's market, the appreciation of the host country's currency attracts the FDI inflows due to higher purchasing power of the domestic consumers. On the other hand, if the FDI's objective is export, appreciation of the host country's currency reduces the FDI inflows through lower competitiveness.

However, these effects and relationship between the exchange rate and FDI are still uncertain. Ellahi (2011)[158] analysed the impact of exchange rate volatility on foreign direct investment on the Pakistan economy and showed that exchange rate volatility had negative effect on FDI and it had shown negative relation or effect in the long run. But Dhakal et.al. (2010)[159] investigated the effect of exchange rate volatility on FDI of some East Asian countries. They identified that exchange rate volatility positively affected the flow of FDI. In other words the study revealed that exchange rate volatility has a favourable effect on foreign direct investment.

In the case of foreign investment especially foreign investment in the capital market exchange rate also has a great impact. The exchange rate affects the effective or expected rate of return on investments. The exchange rate plays an important role in decision making process of an FII investment. As depreciation of the domestic currency results in losses when an FII investment is converted back into the foreign currency while an appreciation of the domestic currency would result in higher returns for the foreign investments. Srinivasan and Kalaivani (2010)[160] explained that exchange rate volatility has significant negative impact on FII inflows both in the short-run and in the long-run, implying that depreciation of

[158] Ellahi, N.(2011). Exchange Rate Volatility and Foreign Direct Investment (FDI) Behavior in Pakistan: A Time Series Analysis with Auto Regressive Distributed Lag (ARDL) Application. *African Journal of Business Management*, 5(29), 11656-11661.

[159] Dhakal, D., Nag, R., Pradhan, G., and Upadhyaya, K. P. (2010). Exchange Rate Volatility and Foreign Direct Investment: Evidence from East Asian countries. *The International Business and Economics Research Journal*, 9(7), 121-128.

[160] Srinivasan, P., and Kalaivani, M. (2010). Foreign Institutional Investment and Stock Market Returns in India: Before and During Global Financial Crisis. *The IUP Journal of Behavioural Finance*, 7(1-2), 59-75.

currency adversely affects the FII flows into India.

3. **Economic Growth**

   Economic growth, usually measured through the Index of Industrial Production (IIP) has two way relationship with foreign investment. According to Maheswari (2015)[161] the strength of the prospect and trend of industrial production in the post reform years initiate the inflow of foreign investment in the economy. Himachalpathy and Kavya (2012)[162] argued that IIP is an important macroeconomic factor for determining the flow of foreign direct investment. Another study by Reenu (2015)[163] using annual data from 1991 to 2010 and by employing Ordinary Least Square Regression Analysis identified market size, trade openness, infrastructure, interest rate and inflation as the major determinants of FDI inflows. The impact of IIP growth in India can contribute positively and statistically significant to FDI flows. A high level of IIP growth is a strong indication of market opportunities. Therefore, IIP growth rate is a good indicator of growing market potential as well as economic prosperity of a country. Higher economic growth implies higher contribution and vibrant economic activities in the global market, higher consumption, greater market size and spending. Therefore, investors are expecting more revenue from their business in India. This positive relationship between growth of IIP and FDI inflows is consistent with the opinion expressed by Billington (1999)[164], Hara and Razafimahefa (2005)[165], Janicki and Wunnava (2004)[166], Ali and Guo (2005)[167] and Singhania and Gupta (2011)[168].

[161] Maheswari J. (2015). Macroeconomic Determinants of Foreign Direct Investment in India. *International Journal of Economic and Business Review*, 3(2), 59-65.

[162] Himachalpathy, R., and Kavya, V.(2012). A Study on the Determinants of Foreign Direct Investment Inflows into India. *Journal of Development Studies*, 19(2), 207-212.

[163] Reenu, S. (2015). Trends and Determinants of Foreign Direct Investment in India: A Study of the Post-Liberalization Period. *South Asian Journal of Management*, 22(3), 96-98.

[164] Billington, N. (1999). The Location of Foreign Direct Investment: An Empirical Analysis. *Applied Economics*, 31(1), 65-76.

[165] Hara, M., and Razafimahefa, F.I. (2005). The Determinants of Foreign Direct Investment into Japan. *Kobe University Economic Review*, 51, 21-34.

[166] Janicki, H., and Wunnava, P. (2004). Determinants of Foreign Direct Investment: Empirical Evidence From EU Accession Candidates. *Applied Economics*, 36(5), 505-509.

[167] Ali, S., and Guo, W. (2005). Determinants of FDI in China. *Journal of Global Business and Technology*, 1(2), 21-33.

[168] Singhania, M., and Gupta, A. (2011). Determinants of Foreign Direct Investment in India. *Journal of International Trade Law and Policy*, 10(1), 64-82.

Since FIIs are motivated by the growth of the companies/sectors in which they have invested, IIP as a factor determining FII flows into India is justified. On the other hand, foreign investment especially foreign portfolio investment also affects the industrial growth rate in India by facilitating the origin of new industries and development of the existing ones ensuring capital for them.

4. **Trade Openness**

The host countries' policies and philosophy towards trade is also an important determinant of foreign investment. Trade Openness (TO), which is the ratio of (imports and exports) to GDP, is one of the pull factors that influence FDI flows to host countries. The openness to trade enhances the attraction of foreign investors to invest in the country. If foreign firms operating in a host country are free to sell their goods and services to other countries it will broaden their market. It will be an added attraction for them to invest in the host countries. Besides, the more the membership of bilateral agreements or regional FTAs that a country is engaged in, the wider the access of other countries to the traded goods and services. It is believed that a country with a greater degree of trade openness, which is more directed towards the external market, would also be more open to foreign capital.

Onyeiwu and Shrestha (2004)[169] found that one of the critical factor that was instrumental in attracting FDI inflows into Africa is the degree of openness of the economy. Mina (2007)[170] also opined the impact of trade openness on FDI was found to be both positive and significant in GCC countries. A Co-integration and Error Correction Modelling (ECM) using monthly time series data by (Zhang and Felmingham 2001)[171] found out that trade openness positively influenced FDI in Central China during the period 1986 to 1999.

[169] Onyeiwu, S., and Shrestha, H. (2004). Determinants of Foreign Direct Investment in Africa. *Journal of Developing Societies*, 20(1-2), 89-106.

[170] Mina, W. (2007). The Location Determinants of FDI in the GCC countries. *Journal of Multinational Financial Management*, 17(4), 336-348.

[171] Zhang, Q., and Felmingham, B. (2001). The Relationship Between Inward Direct Foreign Investment and China's Provincial Export Trade. *China Economic Review*, 12(1), 82-99.

5. **Market Return**

   In the case of foreign investment in the capital market, the Market Return (Stock Market Return - MR)is the main determining factor. The basic rationale for the international capital flows is the rate of return which is higher in a foreign market compared to the domestic market. Capital flows across the geographical boundaries of the countries is mainly to enhance the productivity and effciency of capital at the global level. Hence the rate of return should certainly explain the choice of a particular stock for investment by the FIIs (Babu and Prabheesh 2008)[172].

   These macroeconomic variables and their role in attracting foreign investment in India is analysed using Auto Regressive Distributed Lag (ARDL) Model. In order to ascertain how far these macroeconomic factors determined foreign investment (FDI and FPI) in India, and their short term and long term equilibrium relationship with foreign investment, factors like inflation, exchange rate, trade openness, economic growth and domestic stock market return are hypothesized as determinants. Besides these financial crisis of 2007-08 is also selected as a Dummy Variable (DV). To find out the role of these factors as determinants the two channels of foreign investment in India i.e., FDI and FPI are analyzed separately.

4.2 Determinants of Foreign Direct Investment (FDI) in India

The relationship between foreign direct investment and the macroeconomic variables in India is analyzed with the help of ARDL Test. The expected relationship between foreign direct investment and other macroeconomic variables in India is projected in Table 4.1.

[172]Babu, S., and Prabheesh, K.P. (2008). Causal Relationship between FIIs and Stock Returns in India. *International Journal of Trade and Global Market*, 1(3), 259-265.

Table 4.1: Expected Relationship between Macroeconomic Variables and FDI in India

Variables	Description	Expected Relationship
NEER	Exchange Rate	Positively or Negatively related
WPI	Wholesale Price Index	Negatively or Positively related
IIP	Index of Industrial Production	Positively related
TO	Trade Openness	Positively related

4.2.1 Empirical Model

The model of determinants of FDI inflows into India is formulated with five independent variables viz Economic Growth (IIP), Inflation (WPI), Exchange Rate (NEER), Trade Openness (TO) and Financial Crisis of 2007-08 is used as a Dummy Variable (DV). The period before the crisis has been coded as 1 and the period after the crisis has been coded as 0. Considering these indicators as pull factors a linear equation model is developed in the following way:

$$\text{FDI} = \text{f(NEER, WPI, IIP, TO, DV, } \epsilon)$$

Econometric Model

$$FDI = \alpha + \beta_1 NEER + \beta_2 WPI + \beta_3 IIP + \beta_4 TO + \beta_5 DV + \epsilon \qquad (4.1)$$

4.2.2 Empirical Results

Following are the empirical findings of the Descriptive Statistics, Stationary Test and ARDL Bound Test conducted to find out the determinants of FDI in India.

Table 4.2 depicts the descriptive properties of selected variables over the period 1995 to 2018. This analysis shows the average values of the variables (Mean), Median, Maximum and Minimum Values, Measures of spread of variables (Standard Deviation), Kurtosis, Skewness and for measuring or checking the Normality of data. Jarque-bera Statistic is used to check the normality of residuals. As per the test a data is considered to be normal if the probability

Table 4.2: Descriptive Statistics: Determinants of FDI in India

Variables	Mean	Median	Maximum	Minimum	Std. Devi	Skewness	Kurtosis	J B Coefficient	P - Value
FDI	1370	661	6177	58	1449	1.22	3.77	72.35	0.001
NEER	47.68	45.8	68.24	31.3	8.85	0.73	2.97	23.47	0.001
WPI	111.6	105.7	185.9	62.44	39.7	0.39	1.75	23.77	0.001
IIP	120.15	114.3	198.7	53.63	45.19	0.09	1.43	27.19	0.001
TO	212.43	198.06	431.86	83.79	109.07	0.355	1.668	24.97	0.001

Source: Compiled by the Researcher

value is more than 0.05. In this study since the probability value is less than 0.05 the variables are found not normal.

A Unit Root Test, i.e., the Augmented Dickey Fuller (ADF) Test has been applied to check the stationarity of selected macroeconomic variables and foreign direct investment in India.

Table 4.3: Augmented Dickey-Fuller Unit Root Test for Determinants of FDI in India

Variables	Level						I Difference						Result
	Intercept		Intercept & Trend		None		Intercept		Intercept & Trend		None		
	t- stat	p-value	t- stat	p-value	t- stat	p-value	t- stat	p-value	t- stat	p-value	t- stat	p-value	Stationary
FDI	-3.71945	0.0043	-6.88519	0.001	-1.886	0.0566	-13.31	0.000	-13.28	0.000	-13.32	0.000	I(0)
NEER	-0.70076	0.8434	-1.68994	0.7532	1.81	0.983	-12.0877	0.001	-12.0675	0.001	-11.85	0.001	I(1)
WPI	0.580273	0.989	-1.96399	-1.96399	4.38	1	-9.44694	0.001	-9.49743	0.001	-8.02	0.001	I(1)
IIP	-0.40066	0.9057	-1.71344	0.7427	2.228	0.994	-3.95486	0.001	-3.94554	0.001	-2.83	0.001	I(1)
TO	-1.13	0.70	-2.98	0.13	0.29	0.77	-18.89	0.001	-18.85	0.001	-18.87	0.001	I(1)

Source: Compiled by the Researcher

It is evident from the Table 4.3 that the order of integration of all the variables used in the subject field is either nil or one i.e., I(0) or I(1). As can be seen from the same Table, Economic Growth (IIP), Inflation (WPI), Exchange Rate (NEER) and Trade Openness (TO) are integrated of order one, I(1) and FDI is integrated of order I(0). Since there is a mixture of order of integration ARDL approach for co-Integration is used.

4.3 ARDL Model

The Auto Regressive Distributed Lag (ARDL) Model is applied to examine the co-integration or relationship between FDI and macroeconomic variables in India and to estimate simultaneously the short-run dynamics and long-run coefficients of the determinants of FDI.

Table 4.4: ARDL Model for FDI and its Determinants in India

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
FDI(-1)	0.252752	0.061677	4.098008	0.0001
FDI(-2)	0.202498	0.062881	3.220315	0.0014
NEER	19.77314	11.67924	1.693015	0.0917
WPI	18.50044	9.024865	2.049941	0.0414
IIP	10.63178	4.743283	2.24144	0.0259
TO	0.023514	3.090589	0.007608	0.9939
TO(-1)	4.921512	3.881227	1.26803	0.206
TO(-2)	-7.703344	3.109982	-2.476974	0.0139
DV	126.509	249.6979	0.506648	0.6128
C	-4088.961	1841.472	-2.220485	0.0273
R-squared	0.688859	**Mean dependent var**		1379.429
Adjusted R-squared	0.677702	**S.D. dependent var**		1450.789
S.E. of regression	823.6311	**Akaike info criterion**		16.30288
Sum squared resid	1.70E+008	**Schwarz criterion**		16.43946
Log likelihood	-2117.526	**Hannan-Quinn criter.**		16.35778
F-statistic	61.74534	**Durbin-Watson stat**		1.985614
Prob(F-statistic)	0.001			

Source: Compiled by the Researcher

Accordingly a linear equation model is developed in the following way:

$$\begin{gathered} FDI = \alpha + \beta_1 FDI_{t-1} + \beta_2 FDI_{t-2} + \beta_3 NEER + \beta_4 WPI + \\ \beta_5 IIP + \beta_6 TO + \beta_7 TO_{t-1} + \beta_8 TO_{t-2} + \beta_9 DV + \epsilon \end{gathered} \tag{4.2}$$

Where $t-1$ is variables' lagged value by one period, $t-2$ is variables' lagged value by two period and ϵ is an error term. The lag length is determined automatically by Akaike Information Criterion (AIC).

4.3.1 Optimum Lag Length Criteria

Akaike Information Criterion (AIC) is used to determine the optimum lag length of the model that is to know how many lags are used for this model. According to this test the lower the AIC value, the better the model. Hence as seen in Figure 4.1, the 20 best models are the models with lowest AIC values. The lowest AIC value shows that the optimum lag length is ARDL (2, 0, 0, 0, 2, 0). It means that the dependent variable got lag value 2 and the independent variables got lag values as 0 and 2. With AIC value of 16.311, optimum lag length is 2 lag for FDI, 2 lag for trade openness and lag value 0 for exchange rate, index of industrial production and dummy variable.

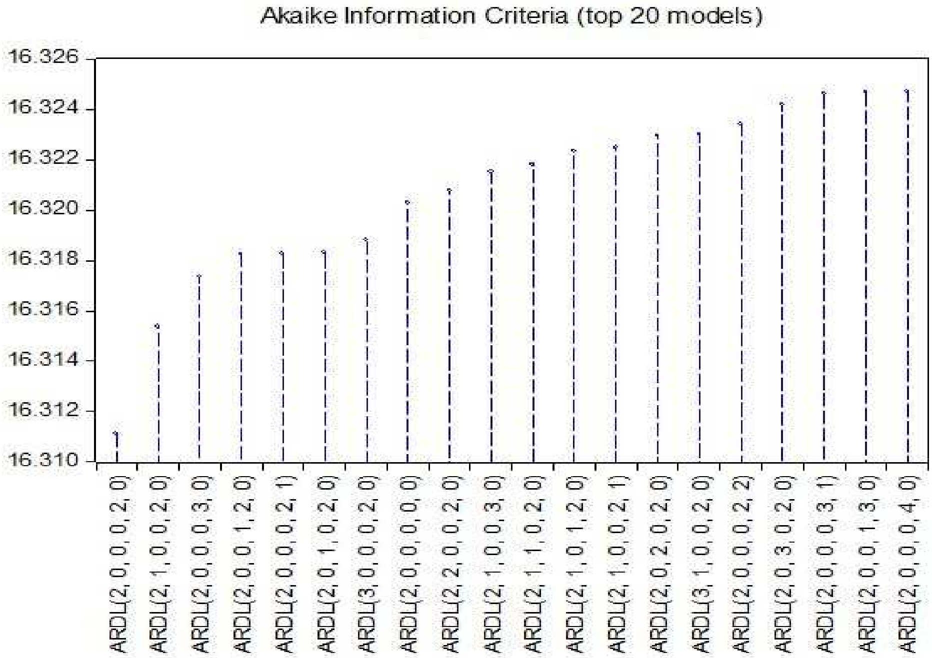

Figure 4.1: Akaike Information Criterion for Determinants of FDI

Table 4.5: Breusch-Godfrey Serial Correlation LM Test for FDI and its Determinants in India

F-statistic	0.205285	**Prob. F(2,249)**	0.8146
Obs* R-squared	0.429648	**Prob. Chi-Square(2)**	0.8067

Source: Compiled by the Researcher

Breusch-Godfrey (1978)[173] LM Test is used for testing or checking the serial correlation and its results are given in Table 4.5. The result shows that P value is greater than 0.05, which indicates that there is no auto correlation and hence no problem of Serial Correlation. RESET Test i.e., Regression Specification

[173]Godfrey, L.G. (1978). Testing Against General Autoregressive and Moving Average Error Models when the Regressors Include Lagged Dependent Variables. *Econometrica*, 46(2), 1293-1301.

Table 4.6: Ramsey RESET Test for FDI and its Determinants in India

	Value	df	Probability
t-statistic	0.948908	250	0.3436
F-statistic	0.900427	(1, 250)	0.3436
F-test summary:			
	Sum of Sq.	**df**	**Mean Squares**
Test SSR	611066.6	1	611066.6
Restricted SSR	1.70E+08	251	678371.6
Unrestricted SSR	1.70E+08	250	678640.8

Source: Compiled by the Researcher

Error Test (Ramsey, 1969)[174] is used for model specification. The result as seen in Table 4.6 indicates that the estimated probability value as 0.34 which is greater than 0.05. This suggests that the model is well specified and without significant omitted variables.

4.3.2 ARDL Bound Test Approach for Co-integration

ARDL Bound Test Approach, developed by Pesaran et al. (2001)[175] is used to investigate the long-run relationship or co-integration among variables in this model. The null hypothesis of the test is that there is no long run relationship between FDI flows and macroeconomic variables in India.

The result of this test is described in Table 4.7. It shows that the computed F-statistic value is 10.13 which is more than the upper bound critical value of 3.79 at 5 percent significant level. It indicates a long-run relationship between variables of this model indicating rejection of the null hypothesis. Therefore it can be concluded that there is a long run relationship or co-integration between macroeconomic variables and FDI in India.

[174] Ramsey, J. B. (1969). Tests for Specification Errors in Classical Linear Least Squares Regression Analysis. *Journal of the Royal Statistical Society*, Series B, 31(2), 350-371.

[175] Pesaran, M.H., Shin, Y., and Smith, R.J. (2001). Bounds Testing Approaches to the Analysis of Level Relationships. *Journal of Applied Econometrics*, 16(2), 289-326.

Table 4.7: ARDL Bound Test for Normalizing FDI and its Determinants

Test Statistic	**Value**		**k**	
F-statistic	10.13540		5	
Critical Value Bounds:				
Significance	**I(0) Bound**		**I(1) Bound**	
10%	2.26		3.35	
5%	2.62		3.79	
2.50%	2.96		4.18	
1%	3.41		4.68	
Null Hypothesis: No long-run relationships exist				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(FDI(-1))	-0.205348	0.062221	-3.300325	0.0011
D(TO)	-0.140407	3.114818	-0.045077	0.9641
D(TO(-1))	7.523521	3.10281	2.424744	0.016
C	-4548.676	1870.31	-2.432044	0.0157
NEER(-1)	22.55304	11.77178	1.915857	0.0565
WPI(-1)	20.76514	9.149789	2.269466	0.0241
IIP(-1)	10.42744	4.845113	2.152155	0.0323
TO(-1)	-2.868727	1.652786	-1.735692	0.0838
DV(-1)	90.12353	244.2502	0.36898	0.7125
FDI(-1)	-0.546881	0.071405	-7.658858	0.001
R-squared	0.378554	**Mean dependent var**		7.687443
Adjusted R-squared	0.356271	**S.D. dependent var**		1026.591
S.E. of regression	823.6618	**Akaike info criterion**		16.30296
Sum squared resid	1.70E+008	**Schwarz criterion**		16.43953
Log likelihood	-2117.536	**Hannan-Quinn criter.**		16.35786
F-statistic	16.98851	**Durbin-Watson stat**		1.993064
Prob(F-statistic)	0.001			
Dependant Variable: D(FDI)				

Source: Compiled by the Researcher

4.3.3 Long Run Coefficients - ARDL Approach

The Table 4.8 estimates the result of coefficient of long run relationship between macroeconomic variables and FDI in India by applying ARDL Methodology. The result shows that the contribution of Economic Growth (IIP) is statistically significant to FDI flows and thus it contributes positively to the FDI flows.

The result also reveals that Inflation (WPI) has positive and statistically

Table 4.8: Estimated Co-integrating Form and Long-run Coefficients Using ARDL Model for FDI and its Determinants

Cointegrating Form				
Variables	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(FDI(-1))	-0.202498	0.062881	-3.220315	0.0014
D(NEER)	19.773136	11.679241	1.693015	0.0917
D(WPI)	18.500441	9.024865	2.049941	0.0414
D(IIP)	10.631784	4.743283	2.24144	0.0259
D(TO)	0.023514	3.090589	0.007608	0.9939
D(TO(-1))	7.703344	3.109982	2.476974	0.0139
D(DV)	126.508961	249.69791	0.506648	0.6128
CointEq(-1)	-0.54475	0.072248	-7.540039	0.001***
Cointeq = FDI - (36.2976*NEER + 33.9613*WPI + 19.5168 *IIP - 5.0635*TO + 232.2329*DV - 7506.1177)				
Long Run Coefficients				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
NEER	36.297601	21.074756	1.722326	0.0862*
WPI	33.961311	16.129773	2.105505	0.0362**
IIP	19.516796	8.689612	2.245992	0.0256**
TO	-5.063451	2.977765	-1.70042	0.0903*
DV	232.232851	450.786753	0.515172	0.6069
C	-7506.117684	3296.561452	-2.276954	0.0236

* Significant at 10% **Significant at 5% ***Significant at 1%

significant relationship on the flow of FDI in India implying only wide fluctuations in inflation rate alone will prevent the flow of foreign capital to India. This finding agrees with the argument that a certain level of inflation, particularly a single digit is desirable to stimulate foreign investments in an economy (Anitha 2012)[176].

This test also reveals the positive and significant impact of exchange rate on FDI flows in India justifying foreign investors' concern of exchange rate stability as it affects the value of their investment as well as the remittance of its profits. The positive relationship between real inward FDI and exchange rate in Nigeria and some East Asian Countries have already been revealed in Osinubi

[176] Anitha, R. (2012). Foreign Direct Investment and Economic Growth in India. *IRJC International Journal of Marketing, Financial Services & Management Research*, 1(8), 108-124.

and Amaghionyeodiwe (2009)[177] and Dhakal et al. (2010)[178] respectively.

But as per the test trade openness has a significant negative influence on the flow of FDI in India during the entire period mainly because of the dominance of import over export. This finding agrees with the finding of Koojaroenprasit (2013)[179] about the negative relationship between trade openess and FDI flows in India. Similarly it is also found that Financial Crisis (selected only as a dummy variable to demarcate pre and post financial crisis period) showed no significant impact on FDI flows in India.

4.3.4 Short Run Coefficient and Error Correction Term

As per the Error Correction Model (ECM) which provides a framework for establishing links between the short-run and long-run approaches to econometric modelling, it is found that all variables except financial crisis are statistically significant in influencing the FDI inflow in India. The coefficient of the Error Correction Term (ECT) is highly significant with expected sign, which confirms the result of Bound Test for Co-Integration. It is the speed of adjustment towards equilibrium. The equilibrium correlation coefficient is estimated -0.54 and is highly significant at one percent.

If the Error Correction Term is negative in sign and significant, it is possible to say that there is a long run causality running from macroeconomic variables to FDI in India. In other words nearly 54 percent of any disequilibrium between these variables is found corrected within one period (one month). The system is getting adjusted towards long run equilibrium at the speed of 54 percent.

[177] Osinubi, T.S., and Amaghionyeodiwe, L.A. (2009). Foreign Direct Investment and Exchange Rate Volatility in Nigeria. *International Journal of Applied Econometrics and Quantitative Studies*, 9(2), 83-116.

[178] Dhakal, D., Nag, R., Pradhan, G., and Upadhyaya, K.P. (2010). Exchange Rate Volatility and Foreign Direct Investment: Evidence from East Asian Countries. *International Business & Economics Research Journal (IBER)*, 9(7), 121-128.

[179] Koojaroenprasit, S. (2013). Determinants of Foreign Direct Investment in India. *Australian Journal of Business and Management Research*, 3(08), 20-30.

4.3.5 Diagnostic Test or Stability Test

The CUSUM Test (Brown, Durbin, and Evans, 1975)[180] used for testing the stability of the parameters on the basis of the cumulative sum of the recursive residuals, is used to examine whether the coefficient of regression are changing systematically or not. If the blue line lies between or within red lines, the null hypothesis is accepted i.e., parameters are stable. Accordingly as Figure 4.2 shows the image of the model is stable.

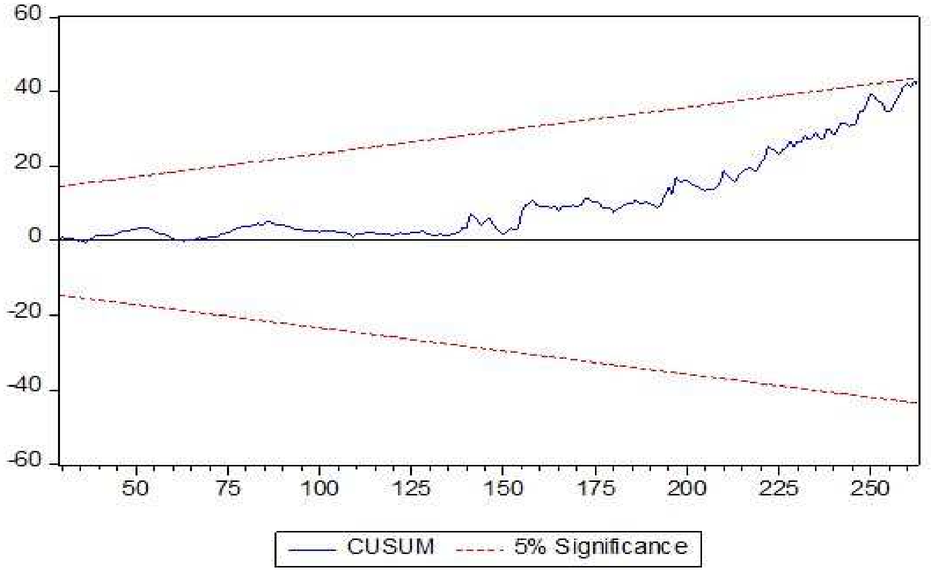

Figure 4.2: Cumulative Sum of Recursive Residuals of FDI and its Determinants

In short as per the test result Inflation (WPI), Exchange Rate (NEER) volatility and Economic Growth (IIP) have significant positive influence on the flow of FDI in India whereas Trade Openness (TO) has significant negative impact on it.

[180]Brown, R., Durbin, J., and Evans, J. (1975). Techniques for Testing the Constancy of Regression Relationships over Time. *Journal of the Royal Statistical Society*, Series B (Methodological), 37, 149-192.

4.4 Determinants of Foreign Portfolio Investment (FPI) in India

The same test is repeated to find out the determinants of foreign portfolio investment flows in India also. Accordingly the relationship between the macroeconomic variables and FPI in India is projected as seen in Table 4.9.

Table 4.9: Expected Relationship between Macroeconomic Variables and FPI in India

Variables	Description	Expected Relationship
NEER	Exchange Rate	Positively or Negatively related
WPI	Wholesale Price Index	Positively or Negatively related
IIP	Index of Industrial Production	Positively related
MR	Market Return	Positively related

4.4.1 Empirical Model

The model of determinants of FPI inflows into India is formulated with five independent variables i.e., Economic Growth (IIP), Inflation (WPI), Exchange Rate (NEER), Domestic Stock Market Return (MR) and Financial Crisis of 2007-2008 is selected as Dummy Variable (DV). The period before the crisis has been coded as 1 and the period after the crisis has been coded as 0. Assuming these macroeconomic variables as the pull factors of net FPI inflows in the country the following linear equation model is developed:

$$\text{FPI} = \text{f(NEER, WPI, IIP, MR, DV, } \epsilon)$$

Econometric Model

$$FPI = \alpha + \beta_1 NEER + \beta_2 WPI + \beta_3 IIP + \beta_4 MR + \beta_5 DV + \epsilon \tag{4.3}$$

4.4.2 Empirical Results

Following are the empirical findings of the Descriptive Statistics, Stationary Test and ARDL Bound Test conducted to find out the determinants of FPI in India.

Table 4.10: Descriptive Statistics: Determinants of FPI in India

Variables	Mean	Median	Maximum	Minimum	Std. Devi	Skewness	Kurtosis	J B Coefficient	P - Value
FPI	846.53	271	28704	-19811	3242	1.67	29.42	7772	0.001
MR	0.99	158	12.59	-24.34	6.09	-0.2	4.28	19.84	0.001
NEER	47.68	45.8	68.24	31.3	8.85	0.73	2.97	23.47	0.001
WPI	111.6	105.7	185.9	62.44	39.7	0.39	1.75	23.77	0.001
IIP	120.15	114.3	198.7	53.63	45.19	0.09	1.43	27.19	0.001

Source: Compiled by the Researcher

Descriptive properties of the variables selected for the test over the period 1995 to 2018 are presented in Table 4.10. Average values of the variables (Mean), Median, Maximum and Minimum Values, Measures of spread of variables or Standard Deviation, Kurtosis and Skewness are calculated for measuring the Descriptive Statistics of the Data. The result of Jarque-bera Statistic, shows that the data series are not normal.

Table 4.11: Augmented Dickey-Fuller Unit Root Test for Determinants of FPI in India

Variables	Level						I Difference						Result
	Intercept		Intercept & Trend		None		Intercept		Intercept & Trend		None		
	t-stat	p-value	t-stat	p-value	t- stat	p-value	t- stat	p-value	t- stat	p-value	t- stat	p-value	Stationarity
FPI	-7.17183	0.001	-7.38465	0.001	-6.4523	0.001	-12.0738	0.001	-12.0526	0.001	-12.098	0.001	I(0)
EX	-0.70076	0.8434	-1.68994	0.7532	1.81	0.983	-12.0877	0.001	-12.0675	0.001	-11.85	0.001	I(1)
WPI	0.580273	0.989	-1.96399	-1.96399	4.38	1	-9.44694	0.001	-9.49743	0.001	-8.02	0.001	I(1)
MR	-12.8223	0.001	-12.8011	0.001	-12.5666	0.001	-12.3497	0.001	-12.324	0.001	-12.3742	0.001	I(0)
IIP	-0.40066	0.9057	-1.71344	0.7427	2.228	0.994	-3.95486	0.002	-3.94554	0.0117	-2.83	0.004	I(1)

Source: Compiled by the Researcher

The results of Augmented Dickey Fuller Unit Root Test for selected determinants of FPI investment are presented in Table 4.11. It is clear that none of the variables have integrated order value higher than or equal to I(2). Foreign Portfolio Investment (FPI) and Stock Market Return(MR) are integrated of order I(0) and these are stationary at level. Inflation (WPI), Exchange Rate (NEER) and Economic Growth (IIP) are integrated of order I(1) i.e., non-stationary at levels but stationary at first difference. Thus, all the series considered for estimating the model, are found not integrated of the same order. Since as per Engle and Granger (1987)[181] method for determining long-run and short-run impact fails to find out the determinants of FPI, the series considered for the study are not integrated of the same order. Therefore ARDL model is selected.

4.5 ARDL Model

As per the Auto Regressive Distributed Lag (ARDL) Model, is applied to examine the short run and long run coefficients of the model simultaneously, where the dependent variable as lagged values and independent variables as current and lagged values they are accounted in the model as additional regressors as shown in Table 4.12.

Table 4.12: ARDL Model for FPI and its Determinants in India

Variables	Coefficient	Std. Error	t-Statistic	Prob.*
FPI(-1)	-0.03453	0.057095	-0.604778	0.5459
FPI(-2)	-0.077625	0.058817	-1.319762	0.1881
FPI(-3)	0.204333	0.058594	3.487292	0.0006
NEER	338.8555	114.4891	2.959718	0.0034
NEER(-1)	-293.3226	112.6637	-2.603523	0.0098
WPI	-0.518854	27.72912	-0.018712	0.9851
IIP	27.51807	16.23843	1.694627	0.0914
MR	154.3801	31.60917	4.884029	0.001
DV	-4874.434	3064.609	-1.590557	0.113
DV(-1)	4923.367	3043.625	1.617599	0.107
C	-6971.616	5918.526	-1.177931	0.2399
R-squared	0.229198	**Mean dependent var**		853.6648
Adjusted R-squared	0.198242	**S.D. dependent var**		3260.558
S.E. of regression	2919.535	**Akaike info criterion**		18.83762
Sum squared resid	2.12E+09	**Schwarz criterion**		18.98827
Log likelihood	-2437.891	**Hannan-Quinn criter.**		18.89818
F-statistic	7.404004	**Durbin-Watson stat**		2.027282
Prob(F-statistic)	0.001			

Source: Compiled by the Researcher

[181] Engle, R.F., and Granger, C.W.J (1987). Co-integration and Error Correction: Representation, Estimation and Testing. *Econometrica*, 55, 251-276.

According a linear equation model is developed in the following way:

$$
\begin{aligned}
FPI = \alpha + \beta_1 FPI_{t-1} + \beta_2 FPI_{t-2} + \beta_3 FPI_{t-3} + \beta_4 NEER + \beta_5 NEER_{t-1} \\
+ \beta_6 WPI + \beta_7 IIP + \beta_8 MR + \beta_9 DV + \beta_{10} DV_{t-1} + \epsilon
\end{aligned} \tag{4.4}
$$

Where $t-1$ is variables' lagged value by one period, $t-2$ is variables' lagged value by two periods, $t-3$ is variables' lagged value by three periods and ϵ is an error term. The lag length is determined automatically by Akaike Information Criterion (AIC).

4.5.1 Optimum Lag Length Criteria

Optimum Lag Length Criteria is used to determine the optimum lag length of the model. The Figure 4.3 depicts 20 best models with lowest AIC values.

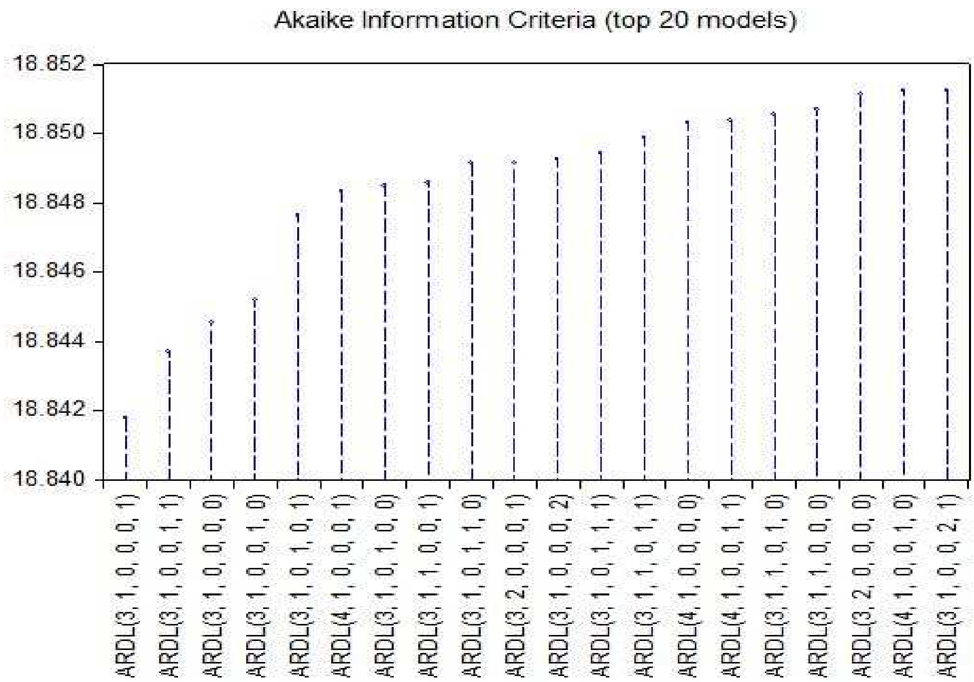

Figure 4.3: Akaike Information Criterion for Determinants of FPI

Among them the better model is selected on the basis of AIC Criterion Selection. The model with the lower AIC score indicates a better model. The lowest AIC value shows that the optimum lag length is ARDL (3, 1, 0, 0, 0, 1).

Table 4.13: Breusch-Godfrey Serial Correlation LM Test for FPI and its Determinants in India

F-statistic	0.228859	**Prob. F(2,247)**	0.7956
Obs*R-squared	0.480917	**Prob. Chi-Square(2)**	0.7863

Source: Compiled by the Researcher

The Breusch-Godfrey (BG) LM Test is used for testing Serial Correlation and its result is given in Table 4.13. Since F-statistic P value is greater than 0.05, it indicates that there is no autocorrelation problem i.e., no problem of Serial Correlation.

Table 4.14: Ramsey RESET Test for FPI and its Determinants in India

	Value	**df**	**Probability**
t-statistic	0.601117	248	0.5483
F-statistic	0.361342	(1, 248)	0.5483
F-test summary:			
	Sum of Sq.	**df**	**Mean Squares**
Test SSR	3087886.	1	3087886.
Restricted SSR	2.12E+09	249	8523682.
Unrestricted SSR	2.12E+09	248	8545601.

Source: Compiled by the Researcher

It can be seen from Table 4.14 that the estimated probability value is 0.5483 which is greater than 0.05. This suggests that the model is well specified and without significant omitted variables.

4.5.2 ARDL Bound Test Approach for Co-integration

The ARDL bound test approach is used to investigate the long-run relationship or co-integration of Foreign Portfolio Investment (FPI) and its macroeconomic determinants in India. The result of the Bound Test are described in Table 4.15. The computed F-statistic value is 11.87 which is more than the upper bound critical value of 3.79 at 5 percent significant level. It indicates a long term relationship between variables of this model. That is there exist a long-run co-integration or relationship among foreign portfolio investment inflows into India and its determinants consisting of Economic Growth (IIP), Inflation (WPI) and Exchange Rate (NEER), Domestic Stock Market Return (MR) and the Financial Crisis of 2007-2008, the Dummy Variable. Therefore it is concluded that there is a long run relationship or co-integration between FPI and its determinants in India.

Table 4.15: ARDL Bound Test for Normalizing FPI and its Determinants

Test Statistic	**Value**		**k**	
F-statistic	11.87596		5	
Critical Value Bounds:				
Significance	**I(0) Bound**		**I(1) Bound**	
10%	2.26		3.35	
5%	2.62		3.79	
2.50%	2.96		4.18	
1%	3.41		4.68	
Null Hypothesis: No long-run relationships exist				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(FPI(-1))	-0.133045	0.086536	-1.537451	0.1255
D(FPI(-2))	-0.219436	0.06084	-3.606751	0.0004
D(NEER)	495.9291	114.8309	4.318778	0.001
D(DV)	-4080.38	3273.706	-1.24641	0.2138
C	-6003.212	6210.441	-0.966632	0.3347
NEER(-1)	39.6701	40.32413	0.983781	0.3262
WPI(-1)	9.930253	29.38846	0.337896	0.7357
IIP(-1)	14.97749	17.47191	0.857233	0.3921
MR(-1)	70.31051	33.48421	2.099811	0.0368
DV(-1)	115.9095	892.0452	0.129937	0.8967
FPI(-1)	-0.925765	0.111843	-8.27735	0.001
R-squared	0.568987	**Mean dependent var**		8.559423
Adjusted R-squared	0.551677	**S.D. dependent var**		4546.003
S.E. of regression	3043.862	**Akaike info criterion**		18.92103
Sum squared resid	2.31E+09	**Schwarz criterion**		19.07167
Log likelihood	-2448.734	**Hannan-Quinn criter.**		18.98159
F-statistic	32.8709	**Durbin-Watson stat**		1.983075
Prob(F-statistic)	0.001			
Dependant Variable: D(FPI)				

Source: Compiled by the Researcher

Table 4.16: Estimated Co-integrating Form and Long-run Coefficients Using ARDL Approach for FPI and its Determinants

Cointegrating Form				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(FPI(-1))	-0.126708	0.083999	-1.50844	0.1327
D(FPI(-2))	-0.204333	0.058594	-3.487292	0.0006
D(NEER)	338.855526	114.489139	2.959718	0.0034
D(WPI)	-0.518854	27.72912	-0.018712	0.9851
D(IIP)	27.518072	16.238428	1.694627	0.0914
D(MR)	154.380093	31.60917	4.884029	0.001
D(DV)	-4874.434415	3064.608575	-1.590557	0.113
CointEq(-1)	-0.907822	0.104413	-8.694559	0.001***
Cointeq = FPI - (50.1563*NEER -0.5715*WPI + 30.3122 *IIP + 170.0555*MR + 53.9011*DV -7679.4970)				
Long Run Coefficients				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
NEER	50.156272	41.293172	1.214638	0.2257
WPI	-0.571537	30.552889	-0.018706	0.9851
IIP	30.312191	17.602931	1.721997	0.0863*
MR	170.055474	39.241669	4.333543	0.001***
DV	53.901074	936.818902	0.057536	0.9542
C	-7679.496979	6359.005336	-1.207657	0.2283

* Significant at 10%   ***Significant at 1%

4.5.3 Long Run Coefficients - ARDL Approach

Finally the ARDL Test is conducted to find out major determinants of foreign portfolio investment flows in India and its results are illustrated in Table 4.16. It can be seen that two explanatory variables, the Domestic Stock Market Return (MR) and Index of Industrial Production (IIP) have positive and statistically significant role in determining FPI in India. This result agrees with the earlier findings of Parsuna (2000)[182], Kumar (2001)[183] and Chakrabarti (2001)[184].

[182]Prasuna, C.A. (2000). Determinants of Foreign Institutional Investment in India. *Finance India*, 4(2), 411-422.

[183]Kumar, S. (2001). Does the Indian Stock Market Play to the Tune of FII Investments? An Empirical Investigation. *ICFAI Journal of Applied Finance*, 17, 441-449.

[184]Chakrabarti, R. (2001). FII Flows to India: Nature and Causes. *Money and Finance ICRA Bulletin*, 2(7), 61-81.

However, the role of the remaining variables are found statistically insignificant i.e., Foreign portfolio investment flows to India is not affected by other macroeconomic variables such as the Inflation (WPI), Exchange Rate (NEER) and Financial Crisis, the Dummy Variable (DV).

4.5.4 Short Run Coefficient and Error Correction Term

The Table 4.16 interprets the short-run coefficient and Error Correction Term (ECT) of the macroeconomic variables or determinants on foreign portfolio investment. It is found that the short run coefficient of three macroeconomic variables i.e., Domestic Stock Market Return (MR), Index of Industrial Production (IIP) and Exchange Rate (NEER) are statistically significant while other two variables i.e., Inflation (WPI) and Financial Crisis selected as Dummy Variable (DV) are found statistically insignificant in the short run.

The coefficient of Error Correction Term (ECT) is negative (-0.90) and it is highly significant at 1 percent level (Prob. 0.001) indicates speed of adjustment of any disequilibrium towards long run equilibrium state. In other words the Error Correction Term guides the variables of the model to regenerate back to equilibrium from a previous period's disequilibrium. Thus, there is a long run causality running from macroeconomic variables to foreign portfolio investment in India. The coefficient of the Error Correction Term (ECT) is highly significant with expected sign, which confirms the result of Bound Test for Co-Integration. The bigger the Error Correction Coefficient the faster will be the return to balance. The equilibrium correlation coefficient is estimated -0.90 and is highly significant at one percent. It too indicates the speed of adjustment towards long run equilibrium. In other words nearly 90 percent of any disequilibrium between these variables is corrected within one period (one month). The system is getting adjusted towards long run equilibrium at the speed of 90 percent.

4.5.5 Diagnostic Test or Stability Test

The CUSUM test is also conducted to find out whether the coefficient of regression is changing systematically or not on the basis of the null hypothesis that parameters are stable or desirable. As in the case of the test conducted previously in connection with the determinants of FDI, if the blue line lies between or within red lines, the null hypothesis is accepted and it indicates that the parameters are stable. The Figure 4.4 indicates that the model used in

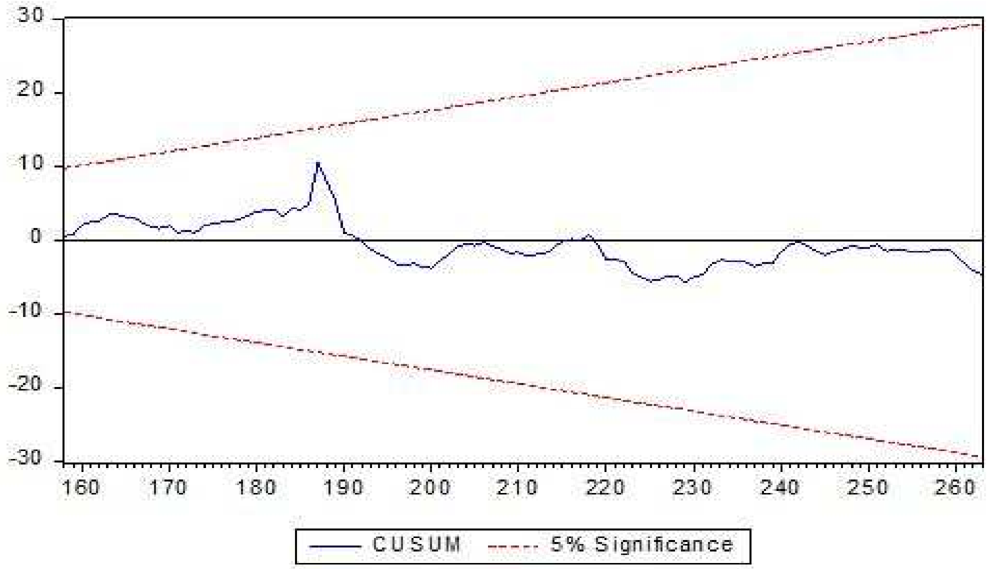

Figure 4.4: Cumulative Sum of Recursive Residuals of FPI and its Determinants

this study is stable i.e., parameters are desirable. It also shows the long run stability of the model. Therefore it is concluded that CUSUM statistic lies between the critical bounds at the 5% level of significance confirming the long run relationship among variables and stability of the coefficient.

The analysis made in this chapter to find out the determining factors of foreign investment in India (FDI and FPI) and the results of the various empirical analysis conducted for the purpose are summarized in Table 4.17 and Table 4.18.

It is seen that Exchange Rate (NEER), Inflation (WPI), and Economic Growth (IIP) are positively related to FDI in India. It shows that they served as the determining factors of FDI in India. However, the generally believed factor

Table 4.17: Determinants of FDI in India

Dependent Variable	**Independent Variables**	**Relation**
FDI	NEER	Positive
	WPI	Positive
	IIP	Positive
	TO	Negative
	DV	Insignificant

Trade Openness (TO) shows negative relation with FDI. Similarly the financial crisis presented as a dummy variable in the model shows only insignificant relation with FDI.

Table 4.18: Determinants of FPI in India

Dependent Variable	**Independent Variables**	**Relation**
FPI	NEER	Insignificant
	WPI	Insignificant
	IIP	Positive
	MR	Positive
	DV	Insignificant

In the case of FPI also almost similar trend is seen. Since Economic Growth (IIP) and Market Return (MR) show positive relation with FPI in India it is possible to conclude that they are the main determining factors of FPI in India. But Exchange Rate (NEER) and Inflation (WPI) have only insignificant relation with FPI implying that they have only insignificant role in attracting FPI in India. As in the case of FDI financial crisis, the dummy variable, shows only insignificant relation with FPI.

If these finding are applied to foreign investment in India as a whole it can be seen that Economic Growth (IIP) of the Indian economy is the only factor - the common factor - which attracted both FDI and FPI. Similarly the financial crisis play only insignificant impact on foreign investment in India.

The preliminary analyses made so far reveal that foreign investment has become a significant reality in the Indian soil. The next chapter examines how this foreign investment impacts the macroeconomic variables of Indian economy.

Chapter 5

Impact of Foreign Investment on the Macroeconomic Variables of Indian Economy

Economy is a system of organizations and institutions that either facilitate or play a role in the production and distribution of goods and services in a society and a large set of inter-related production and consumption activities. The macro economy on the other hand is an aggregate picture of an entire economic environment, such as the economy of a country. Macroeconomic variables like balance of payments, foreign exchange reserves, inflation, exchange rate, foreign direct investment, foreign portfolio investment, economic growth, export, import, interest rate, external debt, capital market etc. (Oliver, B. 2000)[185] are the basic structure or the most fundamental organs of an economy which exert pressure on the economy as a whole.

These variables are interrelated, inter-active and interdependent. Therefore the impact of each of the macroeconomic variables has its immediate reflections on the other macroeconomic variables and thus on the economy as a whole. The emergence of foreign investment as a prominent macroeconomic variable is the most important phenomenon of the post liberalization Indian economy. It impacts the Indian economy independently and in association with other macroe-

[185] Oliver, B. (2000). *Macroeconomics.* Second Edition Prentice Hall New York.

conomic variables of the Indian economy. Therefore the study of the impact of foreign investment on Indian economy essentially is the study of its impact as a macroeconomic variable on the other macroeconomic variables. Accordingly this chapter makes an empirical analysis to find out whether there exist a relationship between foreign investment and the main macroeconomic variables of the Indian economy based on the logical assumption that relationship implies impact. In short if the previous chapter examined how the macroeconomic variables impacted the foreign investment flows, this chapter examines how foreign investment impacts the macroeconomic variables of the Indian economy.

5.1 Impact of Foreign Investment on the Balance of Payments of Indian Economy

Since balance of payments is the best indicator of the financial health of an economy and the most reflective realm of the impact of foreign investment, an examination of the impact foreign investment on an economy must begin with the impact of foreign investment on its balance of payments. In fact as mentioned earlier, it was the balance of payments crisis of the 1990s[186] that paved the way for the arrival of foreign investment to India. Hence it is in the balance of payments of Indian economy that the impact of foreign investment ought to have reflected clearly.

India, like other developing countries, has been a victim of unfavorable balance of payments and it is mainly due to the excess of import over export

[186] Mid 1991 witnessed India plunging into its worst macroeconomic crisis since independence. This serious balance of payments crisis developed as a foreign exchange crisis. In June 1991, India's foreign reserve fell to less than $1 billion; this was only just sufficient to meet two weeks of import requirements. The State Bank of India was just two days away from defaulting on her international obligations. With the fiscal deficit exceeding 8 percentage of the GDP and the current account deficit exceeding 2.5 percentage of the GDP, the macroeconomic fundamentals had turned from bad to worse. NRIs withdrew funds from the NRE(E) accounts resulting in a flight of capital from the country. Inflation shot up to 16.7 percentages. International credit rating agencies like Standard and Poor, Moody's etc downgraded India's credit rating to speculative grade. An important factor that led to the foreign exchange crisis of 1991 was the spurt in India's foreign debt in the eighties. The first dose of liberalization initiated in the latter half of the 1980s necessitated substantial imports. This led to widening trade and current account deficits. Since these deficits were financed through borrowings, it led to sharp rise in the India's foreign debt which shot up from $20.63 billion in 1980 to $83.80 billion in 1981. The Debt Service Ratio spurted to an alarming 35.3 percent. This situation along with the oil crisis of 1991 led to a full blown balance of payments crisis by mid-1991.

and the consequent current account deficit. Therefore balance of payments is closely related to the current account deficit. The Table 5.1 shows how the flow of foreign investment has been balancing the balance of payments of the Indian economy since the 1990s through the reduction of current account deficit and continuing uninterested since then filling her capital account with foreign capital.

As is evident from the Table 5.1 foreign investment has played a crucial role in financing India's current account deficit. In the year 1991-92 the current account deficit was $1178 million. In that year foreign investment could not play any significant contribution for meeting the current account deficit as the contribution of FDI and FPI to the capital account in that year was as low as $129 million and $4 million respectively. The period 1992-93 also showed the same trend of foreign investment. But the following two years i.e., in 1993-94 and 1994-95 foreign investment flows could meet the current account deficit. But from 1995-96 to 1998-99 foreign investment flows dropped drastically and failed to meet the current account deficit.

During 1998-99, 2008-09 and 2015-16 the FPI flows became negative and failed to make any significant contribution to the capital account and thereby to meet the current account deficit. But in all the other years there was enough foreign investment to meet the entire current account deficit either exclusively by it or to make substantial contribution for meeting them. In this way foreign investment could relieve the country from its debt and enabled it for meeting the current account deficit. In other words India's BOP position became favorable since 2001 and this is explicitly due to high flow of foreign investment into India and the consequent hike of the capital account. Table 5.2 shows this improvement of India's balance of payments position and the hike of the capital account year after year.

Figure 5.1 shows that except for four years the entire current account deficit was met with the help of capital account, a component of foreign investment. when foreign investment failed to make significant contribution to meet the current account deficit, India met her current account deficit mainly through external debt. Thus India's unfavorable balance of payments which worsened in the early 1990s is now under control. It is true that despite high flow of foreign

Table 5.1: Foreign Investment and Current Account Deficit (US $ Million)

Year	FDI	FPI	Trade Deficit	CAD
1991-92	129	4	-2798	-1178
1992-93	315	244	-5447	-3526
1993-94	586	3567	-4056	-1159
1994-95	1343	3824	-9049	-3369
1995-96	2143	2748	-11360	-5912
1996-97	2842	3312	-14815	-4619
1997-98	3562	1828	-15507	-5499
1998-99	2480	-61	-13246	-4038
1999-00	2167	3026	-17841	-4698
2000-01	4031	2760	-12460	-2666
2001-02	6125	2021	-11574	3400
2002-03	5036	979	-10690	6345
2003-04	4322	11377	-13718	14083
2004-05	5987	9315	-33702	-2470
2005-06	8901	13492	-51904	-9902
2006-07	22739	7003	-61782	-9565
2007-08	34728	27271	-91468	-15738
2008-09	41737	-13855	-119520	-27914
2009-10	33109	32376	-118203	-38181
2010-11	29029	31471	-127322	-48053
2011-12	32952	17410	-189759	-78155
2012-13	26953	27769	-195656	-88163
2013-14	30763	5029	-147609	-32397
2014-15	35283	42193	-144940	-26859
2015-16	44907	-3643	-130079	-22151
2016-17	42215	7766	-112442	-14417
2017-18	39430	22165	-160036	-48717
Total	**463814**	**261391**	**-1826983**	**-475518**

Source: Handbook of Statistics on the Indian Economy, 2018, RBI Bulletin 2018.

investment, trade deficit and current account deficit existed but this deficit was easily overcome with the help of foreign exchange reserves, the credit of course goes to the capital inflows in the form of foreign investment. Thus in the case of balance of payments of India, the impact of foreign investment is not only positive but also highly substantial and thus the primary objective of

Table 5.2: India's Balance of Payments Position (US $ Million)

Year	Current Account Balance	Capital Account Balance	Overall Balance
1991-92	-1178	3777	2599
1992-93	-3526	2936	-590
1993-94	-1159	9694	8535
1994-95	-3369	9156	5787
1995-96	-5912	4690	-1222
1996-97	-4619	11412	6793
1997-98	-5499	10010	4511
1998-99	-4038	8260	4222
99-2000	-4698	11100	6402
2000-01	-2666	8534	5868
2001-02	3400	8357	11757
2002-03	6345	10640	16985
2003-04	14083	17338	31421
2004-05	-2470	28629	26159
2005-06	-9902	24954	15052
2006-07	-9565	46171	36606
2007-08	-15738	107902	92164
2008-09	-27914	7835	-20079
2009-10	-38181	51622	13441
2010-11	-48053	61103	13050
2011-12	-78155	65324	-12831
2012-13	-88163	91989	3826
2013-14	-32397	47906	15509
2014-15	-26859	88265	61406
2015-16	-22151	40055	17905
2016-17	-14417	35967	21550
2017-18	-48717	92292	43574

Source: Handbook of Statistics on the Indian Economy, 2018, RBI Bulletin 2018.

the initiation of foreign investment to India was achieved and fully justified.

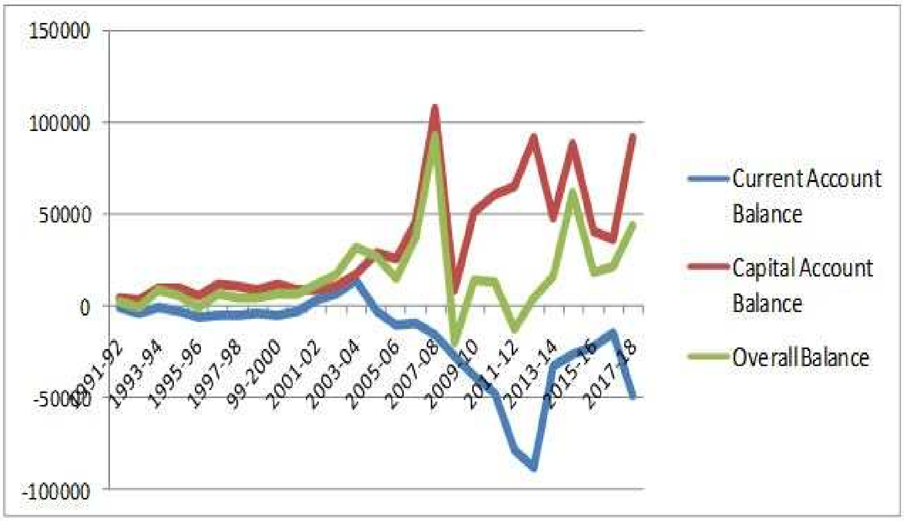

Figure 5.1: India's Balance of Payments

5.2 Foreign Investment - Creator of Foreign Exchange Reserves

Wenkai and Song (2009)[187], who analysed the real effect of foreign investment on the growth of foreign exchange reserves (also known as forex reserves) argue that there is a reciprocal relationship between foreign exchange reserves and foreign investment. According to them the higher the foreign investment the higher will be the foreign exchange reserves and the higher the foreign exchange reserves the higher will be the foreign investment. Foreign investment in India, as elsewhere, has become dominant creator of forex reserves. It works out in a simple and direct way i.e., RBI by taking and converting the dollars which foreign investment brings to the forex reserves and it is with the foreign exchange reserves that mainly foreign investment impacts the macroeconomic variables of the economy. In other words it is in and through the forex reserves, that foreign investment has been playing its decisive role in the Indian economy.

India's Foreign Exchange Reserves (FER) has four components - Foreign Currency Asset (FCA), Gold, Special Drawing Right (SDR) and Reserve Trench Position (RTP). As Figure 5.2 depicts their proportion is in the following way - Foreign Currency Asset 94 percent, Gold 5 percent, SDR and Reserve Trench

[187] Wenkai, S., and Song, M. (2009). FDI's Real Impact on Foreign Exchange Reserves: Evidence from China. *China Economist*, 1, 1-12.

Table 5.3: Composition of India's Foreign Exchange Reserves

YEAR	SDR	GOLD	FCA	RTP	FER (US $ Million)	FER (Rs. Billion)
1991-92	2.33	90.39	145.78	-	9220	238.5
1992-93	0.55	105.49	201.4	-	9832	307.44
1993-94	3.39	127.94	472.87	-	19254	604.2
1994-95	0.23	137.52	660.05	-	25186	797.8
1995-96	2.8	156.58	584.46	-	21687	743.84
1996-97	0.07	145.57	803.68	-	26423	949.32
1997-98	0.04	133.94	1025.07	-	29367	1159.05
1998-99	0.34	125.59	1254.12	-	32490	1380.05
1999-00	0.16	129.73	1529.24	-	38036	1659.13
2000-01	0.11	127.11	1844.82	-	42281	1972.04
2001-02	0.5	148.68	2491.18	-	54106	2640.36
2002-03	0.19	167.85	3414.76	31.9	76100	3614.7
2003-04	0.1	182.16	4662.15	56.88	112959	4901.29
2004-05	0.2	196.86	5931.21	62.89	141514	6191.16
2005-06	0.12	256.74	6473.27	33.74	151622	6763.87
2006-07	0.08	295.73	8365.97	20.44	199179	8682.22
2007-08	0.74	401.24	11960.23	17.44	309723	12379.65
2008-09	0.06	487.93	12300.66	50	251985	12838.65
2009-10	225.96	811.88	11496.5	62.31	279057	12596.65
2010-11	204.01	1025.72	12248.83	131.58	304818	13610.13
2011-12	228.6	1382.5	13305.11	145.11	294398	15061.3
2012-13	235.4	1397.4	14126.3	125.1	292046	15884.2
2013-14	268.3	1296.2	16609.1	110.2	304223	18283.8
2014-15	249.4	1991.6	19854.60	80	341638	21376
2015-16	99.6	1334.3	22190.60	162	360176	23787
2016-17	93.8	1288.3	22449.40	150	369955	23982
2017-18	100.20	1397.40	25975.70	135	424545	27608

Source: Handbook of Statistics on the Indian Economy, 2018, RBI Bulletin 2018.

position 0.5 percent each. Here one can observe that throughout the period under study foreign investment is the major component of foreign exchange reserves in India and in proportion to the increase in foreign investment, foreign exchange reserves also keep on growing. For example in 1991 when foreign investment was $133 million, foreign exchange reserve was only $9220 million. But in 2018 when foreign investment became $61595 million, the foreign exchange reserves also witnessed a corresponding increase and reached a historical high of $424545 million. Even at the peak of the sub-prime crisis of 2008, India had sufficient foreign exchange reserves sufficient to cover 15 months of imports.

The Table 5.3 gives a clear picture of the rise in India's foreign exchange reserves since 1992.

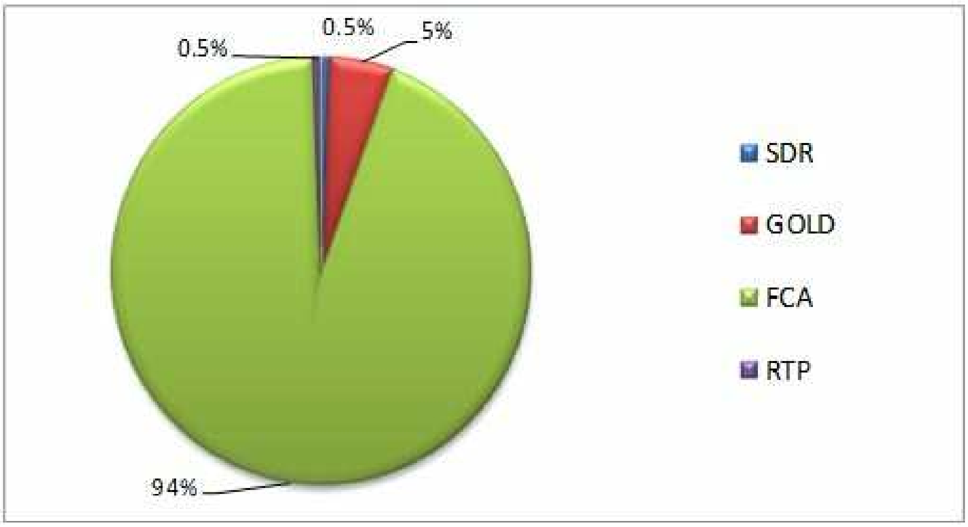

Figure 5.2: Composition of India's Foreign Exchange Reserves

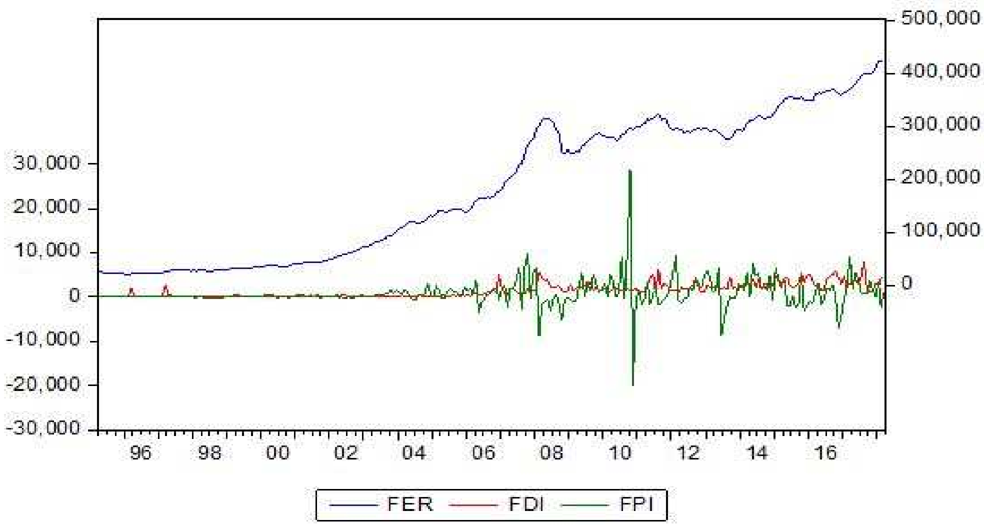

Figure 5.3: Foreign Investment and Foreign Exchange Reserves in India

The Figure 5.3, further represents and substantiates the positive relationship and parallel increase between foreign investment and foreign exchange reserves in India (Appendix C.1).

It is true that foreign investment is not the only source of forex reserves in India. Besides foreign investment (FDI and FPI), accumulation of India's foreign exchange reserves takes place due to consistent positive balance of trade, appreciation of exchange rate, increase or decrease in export and import i.e., international trade, NRI inflows etc. For example exchange rate is an important factor which influences the foreign exchange reserves. When RBI acts with the foreign exchange reserves it will impact exchange rate and consequent increase or decrease of FER. That is when RBI sells some dollars from its forex reserves and buys rupees from the market, this increases the supply of the dollar and the demand of the rupee. This increases the value of the rupee and thereby its appreciation consequent decrease of forex reserves. In other words, when the dollar supplies are huge, the dollar will depreciate and the rupee will appreciate significantly. On the other hand when RBI buys dollars from the market to reduce the dollar supply and sells rupee the value of rupee will decrease and thereby its depreciation and the consequent increase of foreign exchange reserves. Thus by selling or buying the US dollar through money market operations, the rupee can be made to appreciate or depreciate respectively. Romero (2011)[188] made a comparative analysis of the factors affecting foreign exchange reserves and found the existence of an inverse relationship between exchange rate and foreign exchange reserves. When Olayungbo and Akinbobbola (2011)[189] found foreign exchange reserves are significant in influencing nominal exchange rates in the short run, Kasman and Ayhan (2008)[190] found the existence of long run relationship between them. Gokhale and Ramana (2013)[191] established a causal relationship between exchange rate and foreign exchange reserves in the Indian context also.

[188] Romero, A.M. (2011). Comparative Study: Factors that Affect Foreign Currency Reserves in China and India. *The Park Place Economist*, X111, 79-88.

[189] Olayungbo, D.O., and Akinbobola, T.O. (2011). Foreign Exchange Reserves and Exchange Rates in Nigeria. Structural Breaks, Unit Roots and Co-integration Tests, *Journal of Social and Economic Development*, 13(2), 153-162.

[190] Kasman, A., and Ayhan, D. (2008). Foreign Exchange Reserves and Exchange Rate in Turkey: Structural Breaks, Unit Roots and Co-integration. *Journal of Economic Modeling*, 25(1), 83-92.

[191] Gokhale, M.S., and Ramana, J.V. (2013). Causality between Exchange Rate and Foreign Exchange Reserves in the Indian Context. *Global Journal of Management and Business Research Finance*, 13(7), 449-456.

Similarly international trade also affects foreign exchange reserves. That is if the difference between exports and imports is positive FER will accumulate and the value of the currency will move up. On the contrary if imports exceed exports there will be reduction in foreign exchange reserves and value of currency will go down. Chowdhury et al. (2014)[192] confirmed the existence of a strong relationship between foreign exchange reserves, export and import of the country.

5.2.1 Relationship between Foreign Investment and Foreign Exchange Reserves in India - Econometric Analysis

For further verification of the relationship between foreign investment and other macroeconomic variables which have the potential to impact the foreign exchange reserves in India, following econometric tests are conducted. On the basis of the above observations the expected relationship between foreign exchange reserves, foreign investment and other macroeconomic variables is projected in Table 5.4 by taking FER as dependent variable and other variables as independent variables.

Table 5.4: Expected Relationship between Foreign Exchange Reserves and its Linkage with Macroeconomic Variables in India

Dependent Variable	Independent Variable	Expected Relationship
FER	FDI	Positively related
	FPI	Positively related
	REER (Depreciation)	Negatively related
	EXP	Positively related
	IMP	Negatively related

5.2.2 Model Specification

This model considered Foreign Exchange Reserves (FER) as the dependent variable and Exchange Rate (REER), Export (EXP), Foreign Direct Investment

[192]Chowdhury, M.N.M., Uddin, M.J., and Islam, M.S. (2014). An Econometric Analysis of the Determinants of Foreign Exchange Reserves in Bangladesh. *Journal of World Economic Research*, 3(6), 72-82.

(FDI), Foreign Portfolio Investment (FPI) and Import (IMP) as the independent variables. It is algebraically expressed as follows,

$$\text{FER} = \text{f(LFDI, LFPI, LREER, EXP, IMP, } \epsilon)$$

where,
FER = Foreign Exchange Reserves
$LFDI$ = Natural Logarithm of Foreign Direct Investment
$LFPI$ = Natural Logarithm of Foreign Portfolio Investment
$LREER$ = Natural Logarithm of Real Effective Exchange Rate
EXP = Export
IMP = Import
ϵ = Error Term

5.2.3 Stationarity Test

The stationarity of the data series is tested using the Augmented Dickey-Fuller (ADF) Test. The results of the ADF Unit Root Test are shown in Table 5.5. It shows that all the variables are non-stationary at level, but become stationary after first difference. In other words, they are found integrated of the same order, hence it is in order one i.e., I(1).

Table 5.5: Unit Root Test for Foreign Exchange Reserves and Macroeconomic Variables in India

Variables	Level						I Difference						Result
	Intercept		Intercept & Trend		None		Intercept		Intercept & Trend		None		
	t-stat	p-value	t-stat	p-value	t- stat	p-value	t- stat	p-value	t- stat	p-value	t- stat	p-value	Stationarity
FER	-0.34545	0.9147	-2.739331	0.2217	1.377	0.957	-5.69163	0.0	-5.693467	0.0	-5.29	0.0	Stationary at I(1)
LFDI	-1.558809	0.5022	-3.578758	0.0336	0.457969	0.8127	-14.65816	0.0	-14.62863	0.0	-14.65137	0.0	Stationary at I(1)
LFPI	-4.859453	0.0001	-5.020565	0.0002	0.532217	0.8303	-19.30987	0.0	-19.27196	0.0	-19.33417	0.0	Stationary at I(1)
REER	-1.864328	0.3489	-1.601361	0.7902	-0.641107	0.4388	-14.99905	0.0	-15.02706	0.0	-15.018	0.0	Stationary at I(1)
EXP	-0.437642	0.8992	-2.543206	0.3071	0.947188	0.9087	-4.107119	0.0011	-4.105713	0.007	-3.801645	0.0002	Stationary at I(1)
IMP	-0.842574	0.8048	-2.104925	0.5402	0.467222	0.815	-23.87569	0.0	-23.8294	0.0	-23.81519	0.0	Stationary at I(1)

Source: Compiled by the Researcher

5.2.4 Optimum Lag Length Selection Criteria

The study used five lag order selection criteria - Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SC) and Hannan-Quinn Information Criterion (HQ) - to determine the appropriate lag length of the model and as seen in the Table 5.6. Since all criteria except LR and SC, unanimously select lag order 2, it is taken as the optimum lag length.

Table 5.6: VAR Lag Order Selection Criteria for Foreign Exchange Reserves (FER) and Macroeconomic Variables in India

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-7673.712	NA	5.26e+19	62.43669	62.52218	62.47111
1	-6130.545	2998.513	2.51e+14	50.18329	50.78176*	50.42427
2	-6061.479	130.8310	1.92e+14*	49.91447*	51.02591	50.36199*
3	-6027.654	62.42620	1.96e+14	49.93214	51.55657	50.58622
4	-5999.811	50.02669	2.09e+14	49.99846	52.13586	50.85909
5	-5976.664	40.45898	2.33e+14	50.10296	52.75334	51.17015
6	-5950.267	44.85374	2.54e+14	50.18104	53.34438	51.45477
7	-5934.021	26.81344	3.00e+14	50.34163	54.01796	51.82192
8	-5897.182	59.00203*	3.02e+14	50.33481	54.52411	52.02165

** indicates lag order selected by the criterion*

LR: Sequential Modified LR Test Statistic (each test at 5% level)

FPE: Final Prediction Error

AIC: Akaike Information Criterion

SC: Schwarz Information Criterion

HQ: Hannan-Quinn Information Criterion

5.2.5 Johansen Co-integration Test

The presence of a long run relationship or co-movement between foreign exchange reserves and macroeconomic variables in India is tested using Johansen Multivariate Co-integration Test and the result is presented in Table 5.7.

Trace Statistic and Maximum Eigenvalue Statistic are specifically used to identify the number of co-integrating vectors. Both tests indicate one and two co-integrating equations respectively at 5 percent level. However, in case of a multivariate frame i.e., (with variables more than two) it has been seen that Max Eigen value has greater power. Hence, in a multivariate structure it is better to follow the Max Eigen value statistic and the estimated Johansen Co-integration Test results indicate that the variables are co-integrated and have two co-integration equations at the 5 percent level. From these results, it is possible to infer that there is a long run relationship or co-integration between foreign exchange reserves and macroeconomic variables in India.

Table 5.7: Johansen Co-integration Test for Foreign Exchange Reserves (FER) and its Linkage with Macroeconomic Variables in India

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistic**	**0.05 Critical Value**	**Prob.****
None *	0.256624	142.0553	95.75366	0.0000
At most 1	0.133337	66.13774	69.81889	0.0949
At most 2	0.071097	29.50278	47.85613	0.7440
At most 3	0.021701	10.62245	29.79707	0.9695
At most 4	0.017540	5.005892	15.49471	0.8082
At most 5	0.001857	0.475820	3.841466	0.4903
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level				
** denotes rejection of the hypothesis at the 0.05 level*				
***MacKinnon-Haug-Michelis (1999) p-values*				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**0.05 Critical Value**	**Prob.****
None *	0.256624	75.91752	40.07757	0.0000
At most 1 *	0.133337	36.63496	33.87687	0.0228
At most 2	0.071097	18.88033	27.58434	0.4238
At most 3	0.021701	5.616556	21.13162	0.9894
At most 4	0.017540	4.530072	14.26460	0.7996
At most 5	0.001857	0.475820	3.841466	0.4903
Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level				
** denotes rejection of the hypothesis at the 0.05 level*				
***MacKinnon-Haug-Michelis (1999) p-values*				

Source: Compiled by the Researcher

5.2.6 VECM Model

Since the Co-integration Test confirmed the existence of a long run relationship between macroeconomic variables and foreign exchange reserves in India, Vector Error Correction Model (VECM) is used to analyse the long run causality and the short run dynamics of macroeconomic variables and foreign exchange reserves in India (Appendix C.2).

5.2.7 Normalized Co-integrating Coefficients

In order to find out the long run coefficients between foreign investment and foreign exchange reserves, Normalized Co-integration Coefficient is used and its result is depicted in Table 5.8. It reveals that in the long run Foreign Direct Investment (FDI), Foreign Portfolio Investment (FPI) and Exports (EXP) have positive impact on Foreign Exchange Reserves (FER) while Import (IMP) and Exchange Rate (REER) volatility have negative impact on Foreign Exchange Reserves (FER) in India. All these variables are statistically significant at five percent level in the long run (Appendix C.2).

Table 5.8: Normalized Co-integrating Coefficients (Long Run Coefficient) of Foreign Exchange Reserves and Macroeconomic Variables in India

FER	LFDI	LFPI	LREER	EXP	IMP
1.000000	-148307.2	-1006602	212394.0	-41.0103	31.53232
	(18298.0)	(141211.)	(73593.6)	(8.23062)	(5.55572)
**(standard error in parentheses)*					

Source: Compiled by the Researcher

The estimated equation by co-integration is given in Equation 5.1. The signs of the normalized co-integrating coefficients are reversed to enable their proper interpretation.

$$FER = 148307.2LFDI + 1006602LFPI - 212394LREER + 41.01EXP - 31.53IMP \tag{5.1}$$

In order to find out the short run relation between foreign investment and foreign exchange reserves VEC Granger Causality/ Block Exogeneity Wald Test is used and its result is given in Table 5.9. It reveals that in the short run Foreign Direct Investment (FDI), Foreign Portfolio Investment (FPI) and Export (EXP) are statistically significant variables causing variation of Foreign Exchange Reserves (FER), while Import (IMP) and Exchange Rate (REER) are statistically insignificant variables, having no impact on Foreign Exchange Reserve (FER) in India.

Table 5.9: VEC Granger Causality/ Block Exogeneity Wald Test of Foreign Exchange Reserves (FER) and Macroeconomic Variables in India

Excluded	**Chi-sq**	**df**	**Prob.**
D(LFDI)	4.474665	2	0.0067***
D(LFPI)	6.827568	2	0.0329**
D(LREER)	2.420409	2	0.2981
D(EXP)	5.748145	2	0.0565**
D(IMP)	2.355763	2	0.3079
All	**30.32417**	**10**	**0.0008**
Dependent Variable: (FER)			

** Significant at 5% ***Significant at 1%

VECM Estimated Model

$$
\begin{aligned}
D(FER) = C(1) * (&FER(-1) + 2730943.31 * LFPI(-1) - 269054.82 \\
& * LREER(-1) + 145.89 * EXP(-1) - 106.91 * IMP(-1) - 25853483.646) \\
& + C(2) * (LFDI(-1) + 25.20 * LFPI(-1) - 3.24 * LREER(-1) \\
& + 0.00126 * EXP(-1) - 0.000933 * IMP(-1) - 239.74) \\
& + C(3) * D(FER(-1)) + C(4) * D(FER(-2)) + C(5) \\
& * D(LFDI(-1)) + C(6) * D(LFDI(-2)) + C(7) \\
& * D(LFPI(-1)) + C(8) * D(LFPI(-2)) + C(9) \\
& * D(LREER(-1)) + C(10) * D(LREER(-2)) + C(11) \\
& * D(EXP(-1)) + C(12) * D(EXP(-2)) + C(13) \\
& * D(IMP(-1)) + C(14) * D(IMP(-2)) + C(15)
\end{aligned} \tag{5.2}
$$

The Error Correction Term (ECT) measures the speed of adjustment or the amount of time taken by the co-integrated equation to restore the long run equilibrium of dependent variable if a shock occurs in the system. The Error Correction Term of the short run model is also statistically significant with a negative sign (Table 5.10). The negative value of coefficient of ECT or C(2) which is (-0.62), indicates the very high speed of convergence towards equilibrium. Since ECT is found negative and significant it is possible to say that there is a long run causality running from macroeconomic variables to

Table 5.10: Estimates of Error Correction Term for Foreign Exchange Reserves

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	6.12E-005	0.005928	0.010333	0.0218
C(2)	-0.62691	0.069301	-9.045374	0.0003***
C(3)	0.284876	0.071906	3.961769	0.0001
C(4)	0.104271	0.073766	1.413539	0.1577
C(5)	-974.9814	638.4484	-1.527111	0.127
C(6)	93.87256	530.492	0.176954	0.8596
C(7)	-7472.702	3094.227	-2.415046	0.0159
C(8)	-6284.079	2225.647	-2.823485	0.0048
C(9)	13790.91	9818.955	1.404519	0.1604
C(10)	-8647.53	9778.839	-0.884311	0.3767
C(11)	0.471067	0.243046	1.938177	0.0528
C(12)	-0.08463	0.226938	-0.372919	0.7093
C(13)	-0.200603	0.16708	-1.200638	0.2301
C(14)	-0.243015	0.150164	-1.618333	0.1058
C(15)	827.4832	279.0267	2.965606	0.0031

*** Significant at 1%

foreign exchange reserves in India. If disequilibrium exists in the system then Error Correction Term corrects such disequilibrium and provides guidance to variables of the system to come back towards equilibrium at the speed of 62 percent.

5.2.8 Variance Decomposition Analysis

Variance Decomposition Analysis (Lutkepohl, H. 2007)[193] which determines how much of the forecast error variance of each of the variables can be explained by exogenous shocks to the other variables, is used to examine how foreign exchange reserves react to their own shocks and the shocks in other variables. The last ten periods variance decomposition results are shown in the Table 5.11. The columns provide the percentage of the forecast variance due to each innovation in VECM system with each row adding up to 100. In the first

[193] Lutkepohl, H. (2005). *New Introduction to Multiple Time Series Analysis.* Springer-Verlag, Berlin.

month all of the variance in the foreign exchange reserves is explained by its own shocks. The empirical evidence indicates that 87% of Foreign Exchange Reserves (FER) change is contributed by its own innovative shocks. Further, shock in Import (IMP) explains the Foreign Exchange Reserves (FER) by 10.5%. Foreign Portfolio Investment (FPI) contribute 2%, Export (EXP), Foreign Direct Investment (FDI) and Exchange Rate (REER) contribute 0.40%, 0.03% and 0.01% respectively with the Foreign Exchange Reserves (FER).

In short, Foreign Portfolio Investment (FPI) and Import (IMP) are the main factors or determinants of Foreign Exchange Reserves (FER) in India. Whereas, Exchange Rate (REER), Foreign Direct Investment (FDI) and Export (EXP) are found having only a minor role in the fluctuation of foreign exchange reserves in the Indian Economy. Similarly it can be seen that when compared to FDI, FPI is found to be more significant factor in the fluctuation of foreign exchange reserve. Thus this analysis shows that Import (IMP) and Foreign Portfolio Investment (FPI) are the largest components of variation in the Foreign Exchange Reserves (FER) followed by Foreign Direct Investment (FDI), Export (EXP) and Exchange Rate (REER).

Table 5.11: Variance Decomposition of Foreign Exchange Reserves

Period	S.E.	FER	LFDI	LFPI	LREER	EXP	IMP
1	4062.433	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	6933.852	96.77785	0.342915	0.093265	0.172491	1.050430	1.563045
3	9686.433	94.93436	0.180940	0.062321	0.088454	0.662598	4.071325
4	12250.20	93.43012	0.114173	0.480179	0.056409	0.545125	5.373995
5	14672.58	91.64376	0.081101	0.805461	0.039324	0.485029	6.945326
6	16863.59	90.35061	0.061786	1.002087	0.029780	0.472965	8.082774
7	18893.30	89.33392	0.050623	1.235661	0.023727	0.436728	8.919337
8	20766.04	88.50645	0.043098	1.424754	0.019706	0.424539	9.581453
9	22506.71	87.84440	0.038370	1.556401	0.016779	0.416805	10.12724
10	24135.20	87.32879	0.035205	1.675808	0.014596	0.407215	10.53838

Source: Compiled by the Researcher

5.2.9 Impulse Response Analysis

Impulse Response Analysis which studies the reaction of any dynamic system in response to some external changes, is used to trace out the responsiveness of the dependent variables in the Vector Error Correction Model (VECM) to shocks to each of the variables. Impulse Response Function (IRF) indicates the positive or negative direction or the nature of the variation of the endogenous variables. X-axis (horizontal axis) represents the time horizon or the duration of the shock while the Y-axis (vertical axis) gives the direction and intensity of the impulse. Figures 5.4 depicts that the impulse response of foreign exchange reserves for the one unit standard deviation innovation in macroeconomic variables in India.

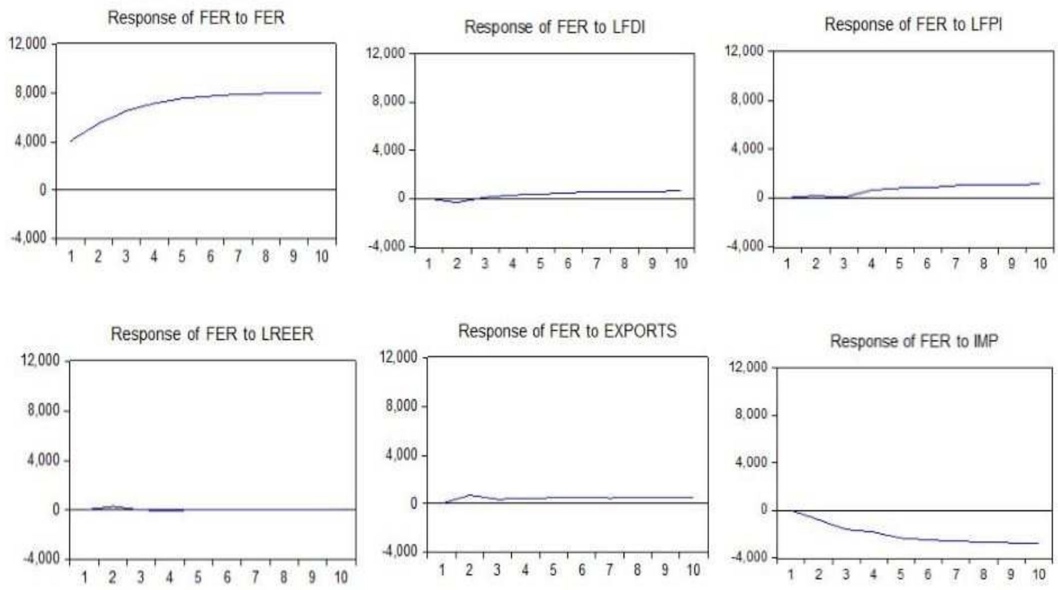

Figure 5.4: Impulse Response of Foreign Exchange Reserves

An immediate and permanent effects of a one standard deviation shock to Foreign Direct Investment (FDI), Foreign Portfolio Investment (FPI) and Export (EXP) are positive towards Foreign Exchange Reserves in the long run. It implies that foreign investment helps the country to raise the foreign exchange reserves. A significant and positive impact throughout the period by foreign exchange reserves responds to its own shocks. The innovation in Exchange Rate (REER) is found insignificant effect on Foreign Exchange Reserves (FER) during the entire period. It is found that the signs of response innovation to Import (IMP) always have a negative impact on the variation in foreign exchange reserves in Indian economy.

The above analysis related to foreign investment and foreign exchange reserves in India can be summarized in the following way.

- Foreign investment is the major component of FER
- Increase in foreign investment is always followed by a corresponding increase in FER
- The statistical test confirmed the above finding i.e., it is found that there is a long run and short run positive relationship between both form of foreign investment and FER
- FPI is found to be more significant factor in the fluctuation of FER in India when compared to FDI.

All these findings establish the strong positive relationship that exists between foreign investment and foreign exchange reserves in India. This relationship is the greatest testimony of the positive impact of foreign investment on Indian economy as foreign exchange reserves is one of the most prominent indicator of the strength of an economy. In other words foreign investment strengthens the Indian economy by contributing immensely to the foreign exchange reserves and thereby enabling the economy to absorb sudden shocks.

5.3 Impact of Foreign Investment on the Inflation in India

Inflation, usually measured by the Wholesale Price Index (WPI) is one of the characteristic features of all the economies of the world especially of the developing ones like that of India. It is highly vulnerable, sensitive and even contagious to the other macroeconomic variables of the economy. In fact all attempts in the direction of the economic development will become futile if they lead to high rate of inflation or are incapable to contain or control it. Therefore how to reconcile inflation with attempts for economic development including invitation of foreign investment has become one of the major hurdles confronting the economists and policy makers.

Inflation, the result of increased money supply, is bound to be antithetical to foreign investment which is nothing other than flow of foreign capital to the economy. Therefore all the positive contributions of foreign investment to the Indian economy must go through a final as well as crucial test in relation to its role in the inflation of the Indian economy. The factors generally attributed to inflation in India are Foreign Investment (FDI & FPI), Crude Oil Price (COP), Exchange Rate (NEER), Economic Growth (IIP) etc. Among these foreign investment has a major role and it can cause inflation in the following way. The inflow of huge amount of foreign investment into India creates a lot of demand for rupee. In order to meet this demand it become necessary for the RBI to pump more money to the market. This situation leads to excess liquidity and the floating of excess cash in the market thereby creating inflation (Raj et al. 2008[194]).

The Figure 5.5 shows how foreign investment and inflation go hand in hand in India. It indicates that in India there is a positive relationship between foreign investment and inflation i.e., increase in foreign investment flows leads to an increase in inflation. A further and closer analysis made with the help of Correlation Matrix reinforces the positive relationship between foreign investment and inflation in India. From the Correlation Matrix (Appendix C.3) it can be seen that both form of foreign investment has positive influence on the inflation in India - Foreign Direct Investment (FDI) have high positive correlation (0.77) whereas Foreign Portfolio Investment (FPI) has only a moderate positive influence (0.13).

Another factor which is explicitly responsible for inflation in India is crude oil price. Shaari et al. (2012)[195] found that, in the short run, crude oil price affects inflation. According to Tweneboah and Adam (2008)[196] rise in oil price increases the production cost and thus inflation appears in the economy. India is one of the largest importer of crude oil in the world. India imports nearly 80 percent of her total oil requirements. Hence a rise in oil price leads to an increase in the prices of all goods and services and the consequent rise in inflation. Therefore a fall in crude oil price is favorable to the Indian economy as

[194]Raj, J., Dhal, S., and Jain, R. (2008). *Imported Inflation: The Evidence from India.* Reserve Bank of India Occasional Papers, 29(3), 69-117.

[195]Shaari, M.S., Hussain, N.E., and Abdullah, H. (2012). The Effects of Oil Price Shocks and Exchange Rate Volatility on Inflation: Evidence from Malaysia. *International Business Research*, 5(9), 106-119.

[196]Tweneboah, G., and Adam, A.M. (2008). *Implications of Oil Price Shocks for Monetary Policy in Ghana: A Vector Error Correction Model.* University Library of Munich, Germany, MPRA Paper Series. 11968.

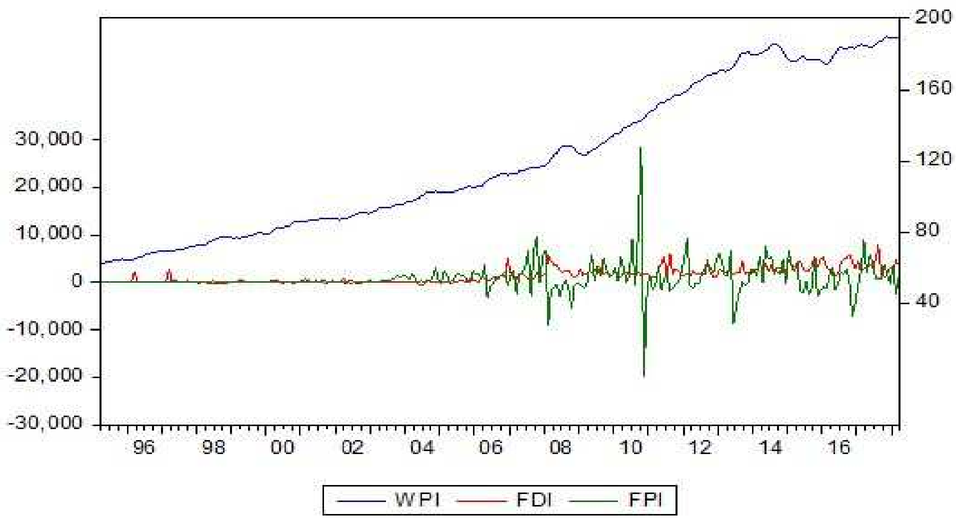

Figure 5.5: Trends in Foreign Investment Flows and Inflation in India

it helps the country to save on import bill and narrowing trade deficit, leading to lower inflation.

The other factor which has the potential to cause inflation in India is exchange rate. Any appreciation or depreciation of the national currency can have a significant impact on inflation. If there is depreciation in the exchange rate it is likely to cause an increase in inflation as the import price will soar high. A depreciation means the currency buys less foreign exchange, therefore imports become more expensive and exports cheaper. On the contrary an appreciation in the exchange rate will tend to reduce inflation as import price become cheaper. According to Philip and Oseni (2012)[197] increase or decrease in the exchange rate of a country affects prices of imported goods and services, and thus inflation increases or decreases there. Imimole and Enoma (2011)[198] also described how exchange rate depreciation increases the cost of imported goods and the consequent increase in inflation.

Similarly economic growth especially industrial production becomes another factor which is related for inflation. Industrial production which is insufficient to meet the huge demand for industrial goods emerged due to the increase of

[197]Philip, I.N., and Oseni, I.O. (2012). Monetary Policy, Exchange Rate and Inflation Rate in Nigeria: A Co-integration and Multi-Variate Vector Error Correction. *Research Journal of Finance and Accounting*, 3(3), 62-69.

[198]Imimole, B., and Enoma, A. (2011). Exchange Rate Depreciation and Inflation in Nigeria. *Business and Economics Journal*, 28(1), 1-12.

money supply in the economy and this leads to price rise and inflation.

5.3.1 Relationship between Foreign Investment and Inflation in India - Econometric Analysis

In order to verify the relationship between foreign investment and inflation in India, the following econometric tests are conducted. The expected relationship between inflation (WPI), foreign investment and other inflation causing macroeconomic variables are presented in the Table 5.12.

Table 5.12: Expected Relationship between Inflation (WPI) and its Linkage with Macroeconomic Variables in India

Dependent Variable	Independent Variables	Expected Relationship
WPI	FDI	Positively related
	FPI	Positively related
	COP	Positively related
	NEER (Depreciation)	Positively related
	IIP (Inadequate)	Positively related

5.3.2 Model Specification

On the basis of this expected relationship between inflation in India and the macroeconomic variables, a model is developed in the following way.

$$\text{WPI} = \text{f(LFDI, LFPI, LCOP, IIP, NEER, } \epsilon)$$

where,
WPI = Wholesale Price Index
LFDI = Natural Logarithm of Foreign Direct Investment
LFPI = Natural Logarithm of Foreign Portfolio Investment
LCOP = Natural Logarithm of Crude Oil Price
IIP = Index of Industrial Production
NEER = Nominal Effective Exchange Rate
ϵ = Error Term

5.3.3 Stationarity Test

The stationarity property of macroeconomic variables and inflation in India is tested with the help of Unit Root Test and its results presented in Table 5.13 show that all the variables used in the study are not stationary at level but stationary at first difference I(1).

Table 5.13: Unit Root Test for Inflation (WPI) and the Macroeconomic Variables in India

Variables	Level						I Difference						Result
	Intercept		Intercept & Trend		None		Intercept		Intercept & Trend		None		
	t-stat	p-value	t-stat	p-value	t- stat	p-value	t- stat	p-value	t- stat	p-value	t- stat	p-value	Stationarity
WPI	0.580273	0.989	-1.963988	-1.963988	4.38	1	-9.446943	0.0	-9.497427	0.0	-8.02	0.0	Stationary at I(1)
LFDI	-1.558809	0.5022	-3.578758	0.0336	0.457969	0.8127	-14.65816	0.0	-14.62863	0.0	-14.65137	0.0	Stationary at I(1)
LFPI	-4.859453	0.0001	-5.020565	0.0002	0.532217	0.8303	-19.30987	0.0	-19.27196	0.0	-19.33417	0.0	Stationary at I(1)
LCOP	-1.570214	0.4964	-2.264153	0.4516	0.896319	0.9008	-12.50597	0.0	-12.51105	0.0	-12.45769	0.0	Stationary at I(1)
NEER	-1.244568	0.6555	-3.384999	0.0556	-1.994339	0.0444	-12.90082	0.0	-12.88259	0.0	-12.72284	0.0	Stationary at I(1)
IIP	-0.400662	0.9057	-1.713438	0.7427	2.228	0.994	-3.954859	0.002	-3.945539	0.0117	-2.83	0.004	Stationary at I(1)

Source: Compiled by the Researcher

5.3.4 Optimum Lag Length Selection Criteria

In order to determine the optimum lag length of the model Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SC) and Hannan-Quinn Information Criterion (HQ) are used and as can be seen from Table 5.14, except LR all other criteria unanimously select lag order 2 (lower the value, better the model) as optimal lag for the model.

5.3.5 Johansen Co-integration Test

Since the variables are found stationary at the same order Johansen Co-integration Test is used to check the co-integration or long run association between macroeconomic variables and inflation in India. It is based on two test statistic, i.e., Trace Statistic and the Maximum Eigenvalue Statistic. The resultant Table 5.15 shows that both Trace test and Max-Eigenvalue Test indicate two co-integrated equations at 5 percent level. Therefore there is a long run relationship or co-integration between macroeconomic variables and inflation in India

Table 5.14: VAR Lag Order Selection Criteria for Inflation (WPI) and Macroeconomic Variables in India

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-3053.441	NA	2556.100	24.87350	24.95900	24.90793
1	-1288.222	3429.978	0.002004	10.81481	11.41328	11.05579
2	-1161.917	239.2591	0.000962*	10.08063*	11.19208*	10.52816*
3	-1134.943	49.78205	0.001037	10.15401	11.77843	10.80809
4	-1116.037	33.96953	0.001194	10.29298	12.43038	11.15361
5	-1095.458	35.97053	0.001359	10.41836	13.06873	11.48554
6	-1059.884	60.44828*	0.001372	10.42182	13.58517	11.69555
7	-1034.181	42.42038	0.001503	10.50553	14.18186	11.98582
8	-1011.112	36.94650	0.001688	10.61067	14.79997	12.29751

** indicates lag order selected by the criterion*

LR: Sequential Modified LR Test Statistic (each test at 5% level)

FPE: Final Prediction Error

AIC: Akaike Information Criterion

SC: Schwarz Information Criterion

HQ: Hannan- Quinn Information Criterion

i.e., the presence of co-integration implies the existence of a stable long run relationship between macroeconomic variables and inflation in India.

5.3.6 VECM Model

Vector Error Correction Model (VECM) has been used to examine the long run coefficients and short run dynamics among the macroeconomic variables and inflation in India. The most important criteria of employing the VECM techniques is that all variables must be non-stationary at level i.e., I(0) but stationary at their first difference I(1). The VECM results are presented in Appendix C.4.

5.3.7 Normalized Co-integrating Coefficients

The Normalized Co-integrating Coefficients presented in Table 5.16 describes the long run, clear and reliable positive relationship of Foreign Direct Investment (FDI), Foreign Portfolio Investment (FPI) and Crude Oil Price (COP)

Table 5.15: Johansen Co-integration Test for Inflation (WPI) and its Linkage with Macroeconomic Variables in India

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistic**	**0.05 Critical Value**	**Prob.****
None *	0.212004	141.3833	95.75366	0.0000
At most 1 *	0.124051	80.38820	69.81889	0.0056
At most 2	0.077066	46.48160	47.85613	0.0669
At most 3	0.055801	25.95114	29.79707	0.1302
At most 4	0.040075	11.25216	15.49471	0.1964
At most 5	0.003049	0.781795	3.841466	0.3766
Trace test indicates 2 cointegrating eqn(s) at the 0.05 level				
** denotes rejection of the hypothesis at the 0.05 level*				
***MacKinnon-Haug-Michelis (1999) p-values*				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**0.05 Critical Value**	**Prob.****
None *	0.212004	60.99506	40.07757	0.0001
At most 1 *	0.124051	33.90660	33.87687	0.0496
At most 2	0.077066	20.53047	27.58434	0.3056
At most 3	0.055801	14.69897	21.13162	0.3106
At most 4	0.040075	10.47037	14.26460	0.1828
At most 5	0.003049	0.781795	3.841466	0.3766
Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level				
** denotes rejection of the hypothesis at the 0.05 level*				
***MacKinnon-Haug-Michelis (1999) p-values*				

Source: Compiled by the Researcher

with the Inflation (WPI) in India. However, Exchange Rate (NEER) and Index of Industrial Production (IIP) are found to have significant negative effects on inflation in India.

Table 5.16: Normalized Co-integrating Coefficients (Long Run Coefficient) of Inflation (WPI) and Macroeconomic Variables in India

WPI	**LFDI**	**LFPI**	**LCOP**	**NEER**	**IIP**
1.000000	-214.71	-952.4348	-24.65635	10.97137	9.791471
	(31.3956)	(179.630)	(42.2458)	(1.92892)	(1.52301)
** (standard error in parentheses)*					

Source: Compiled by the Researcher

The estimated equation by co-integration is given in Equation 5.3. The signs of the normalized co-integrating coefficients are reversed to enable proper **interpretation.**

$$WPI = 214.71LFDI + 952.43LFPI + 24.65COP - 10.97NEER - 9.79IIP \tag{5.3}$$

Table 5.17: VEC Granger Causality/ Block Exogeneity Wald Test of Inflation (WPI) and Macroeconomic Variables in India

Excluded	Chi-sq	df	Prob.
D(LFDI)	3.281549	2	0.1938
D(LFPI)	0.917663	2	0.6320
D(LCOP)	42.47768	2	0.0000***
D(NEER)	3.375283	2	0.1850
D(IIP)	15.61699	2	0.0004***
All	**83.32796**	**10**	**0.0000**
Dependent variable: D(WPI)			

*** Significant at 1%

The result of the Block Exogenity Wald Test Model used to check the short run impact of the macroeconomic variables on inflation in India is presented in the Table 5.17. It is found that in the short run Crude Oil Price (COP) and Economic Growth (IIP) are the main influencing factors of inflation in India. But the influence of Foreign Direct Investment (FDI), Foreign Portfolio Investment (FPI) and Exchange Rate (NEER) on inflation in India are found statistically insignificant.

VECM Estimated Model

$$\begin{aligned} D(WPI) = C(1) * (WPI(-1) - 162.053 * LFPI(-1) + 12.32 \\ * LCOP(-1) + 1.430 * NEER(-1) - 0.4434 \\ * IIP(-1) + 1312.39) + C(2) * (LFDI(-1) + 3.68 \\ * LFPI(-1) + 0.1722 * LCOP(-1) - 0.0444 \\ * NEER(-1) - 0.0476 * IIP(-1) - 34.37) \\ + C(3) * D(WPI(-1)) + C(4) * D(WPI(-2)) + C(5) \\ * D(LFDI(-1)) + C(6) * D(LFDI(-2)) + C(7) \\ * D(LFPI(-1)) + C(8) * D(LFPI(-2)) + C(9) \\ * D(LCOP(-1)) + C(10) * D(LCOP(-2)) + C(11) \\ * D(NEER(-1)) + C(12) * D(NEER(-2)) + C(13) \\ * D(IIP(-1)) + C(14) * D(IIP(-2)) + C(15) \end{aligned} \tag{5.4}$$

Table 5.18: Estimates of Error Correction Term for Inflation (WPI)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.004226	0.003146	-1.3433	0.1794
C(2)	-0.330879	0.094093	-3.516494	0.0005***
C(3)	0.441631	0.06582	6.709625	0.000
C(4)	0.024298	0.062228	0.390467	0.6962
C(5)	0.155142	0.095037	1.632444	0.1028
C(6)	0.02502	0.080918	0.309202	0.7572
C(7)	-0.101517	0.480347	-0.21134	0.8327
C(8)	0.235956	0.36958	0.638443	0.5233
C(9)	3.454223	0.529681	6.521332	0.000
C(10)	-0.257611	0.574734	-0.448226	0.6541
C(11)	-0.023448	0.025593	-0.916158	0.3597
C(12)	0.044604	0.025447	1.752799	0.0798
C(13)	0.016584	0.008183	2.026759	0.0429
C(14)	-0.012532	0.007913	-1.583709	0.1135
C(15)	0.227159	0.051696	4.39411	0.000

*** Significant at 1%

In the presence of co-integration, there always exists a corresponding error correction representation, captured by the Error Correction Term (ECT). Error correction is the best way for the correction of disequilibrium position and in this way it enables the variables to come back to the equilibrium position. If the ECT or C(2) is negative and significant then one can say that there is a long run causal relationship between inflation and macroeconomic variables in India. This implies that the speed of adjustment between the short run dynamics and the long run equilibrium relationship is at the rate of 33% as shown in the Table 5.18.

5.3.8 Variance Decomposition Analysis

The Variance Decomposition Analysis is used to understand the proportion of the fluctuation of dependent variable i.e., inflation in future. It is explained by its own shocks versus shocks from other macroeconomic variables. In other words, Variance Decomposition gives the proportions of the movement in the inflation i.e., WPI (dependent variable) in future that are due to their 'own' shocks, versus shocks to the other variables. The result of the Variance Decomposition Analysis is presented in Table 5.19. It shows the extent to which these shocks are responsible for the volatility of WPI by the end of the 10 months period. In the first month all the variance in WPI is explained by its own shock. This share reduces in subsequent period to 69% and explanatory variables explain the remaining 31%. The empirical evidence indicates that FDI and Crude Oil Price (COP) explain 12 percent each whereas IIP is 6 percent. But FPI and NEER are found at 0.66 and 0.18 percent respectively.

Table 5.19: Variance Decomposition of Inflation (WPI)

Period	S.E.	WPI	LFDI	LFPI	LCOP	NEER	IIP
1	0.650433	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	1.231556	92.29555	0.345110	0.117167	5.037223	0.033293	2.171656
3	1.735258	87.97479	1.688856	0.109419	8.527891	0.049013	1.650032
4	2.199968	84.20344	3.239544	0.072479	10.24097	0.183253	2.060318
5	2.604505	80.34262	5.047266	0.064005	11.49480	0.264780	2.786527
6	2.957058	77.25471	6.888586	0.094529	12.09425	0.281716	3.386207
7	3.273689	74.66376	8.521759	0.196505	12.32800	0.266592	4.023383
8	3.560123	72.44450	9.955465	0.328528	12.41725	0.240733	4.613520
9	3.823050	70.58196	11.17775	0.485417	12.41161	0.213555	5.129704
10	4.067492	69.00304	12.19966	0.664932	12.36128	0.189606	5.581486

Source: Compiled by the Researcher

5.3.9 Impulse Response Analysis

As per Impulse Response Analysis (IRA) it is seen that a one standard deviation of impulse in Foreign Portfolio Investment (FPI), Crude Oil Price (COP), Exchange Rate (NEER) and Index of Industrial Production (IIP) are positive towards WPI in India. But with regard to Foreign Direct Investment (FDI) it is negative towards inflation in the long run as seen in Figure 5.6.

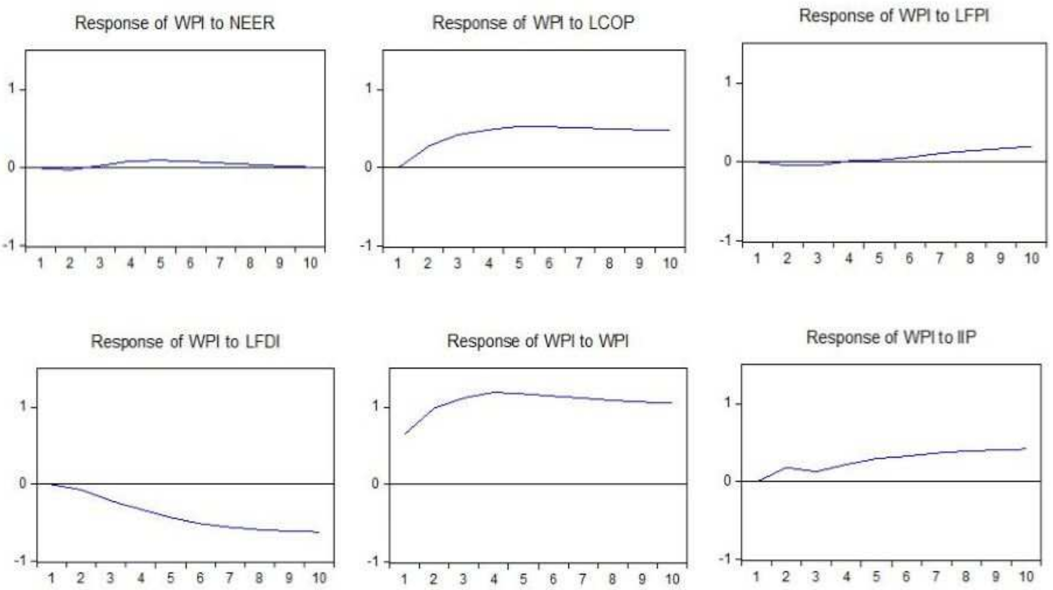

Figure 5.6: Impulse Response of Wholesale Price Index

In short the above analysis leads to the conclusion that among the inflation causing factors in India both form of foreign investment (FDI and FPI) play significant roles. This implies that there is a positive relationship between inflation and foreign investment in India indicating that foreign investment in India causes inflation. Prima fascia it appears as negative impact of foreign investment on Indian economy. No economy in the world can claim to be totally free from inflation. Hence what matters is not inflation but the rate or level of inflation. This is a consoling fact to foreign investment in India because though the relation between foreign investment and inflation is positive, it never caused to cross a single digit inflation in India.

Empirical evidence emphasizes that the growth-inflation relationship depends on the level of inflation - at some low level, inflation may be positively correlated with growth, but at higher level inflation is likely to be detrimental to growth. Mubarik (2005)[199] concluded that high inflation i.e., inflation beyond 9 percent only adversely affects growth. Thus as already seen low level of inflation i.e., inflation below two digit will not adversely affect the economy.

Hence it can be argued that the positive and significant relationship existing between foreign investment and inflation in India is not really a negative impact of foreign investment on her economy as it did not generate high rate of inflation. It follows that the negative impact of foreign investment via inflation is not a damaging one for the Indian economy.

5.4 The Impact of Foreign Investment on the Exchange Rate in India

Foreign investment as already seen has the potential to impact exchange rate. An increase in Nominal Effective Exchange Rate (NEER)[200] which is a measure of the value of a currency against a weighted average of several foreign currencies, indicates an appreciation of the local currency against the weighted basket of currencies of its trading partners. In this way with regard to exchange rate of India, foreign investment has a decisive role. Huge amount of foreign investment in India leads to the rise in the demand and appreciation of the domestic currency and the consequent increase (appreciation) in exchange rate. In other words large capital inflows through foreign investment witness an appreciation of domestic currency because of the rise of its demand. Every dollar foreign investment brings to the country is in effect is the creation of demand for Indian currency. That is when foreign investors convert their currency into domestic currency, the demand for domestic currency increases and domestic currency is

[199] Mubarik, Y.A. (2005). Inflation and Growth: An Estimate of the Threshold Level of Inflation in Pakistan, State Bank of Pakistan. *Research Bulletin*, 1(1), 35- 44.

[200] Exchange rate has two aspects - Nominal Effective Exchange Rate (NEER) and Real Effective Exchange Rate (REER). The indices of NEER and REER are used as indicators of external competitiveness. NEER is the weighted average of bilateral nominal exchange rates of the home currency in terms of foreign currencies. Conceptually, the REER, 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. The NEER and REER indices show the appreciation (Index above 100) or depreciation (Index below 100) of the national currency against a basket of selected currencies for a certain period relative to a base period. Indices of REER and NEER of the Indian Rupee (6-Currency Trade Based Weights) with common base year 2004-05 is taken in this study for analysis of the model.

appreciated which in turn boosts the exchange rate. Thus increased demand of Indian currency results in the increase of its value and its appreciation increases the exchange rate.

According to Morrissey et al. (2004) [201] FDI inflows lead to real exchange rate appreciation i.e., FDI has direct impact on the performance of exchange rate. Chaudhary et al. (2012)[202] applying the Vector Auto Regressive Model found a positive relation between FDI and real exchange rate in the long run. In the same way FPI also impacts the exchange rate. That is FPI leads to rupee appreciation and their disinvestment and selling lead to depreciation. According to Klein and Rosengren (1992)[203] foreign institutional investment in India will lead to rupee appreciation with several other currencies and their selling and disinvestment will lead to depreciation of the rupee.

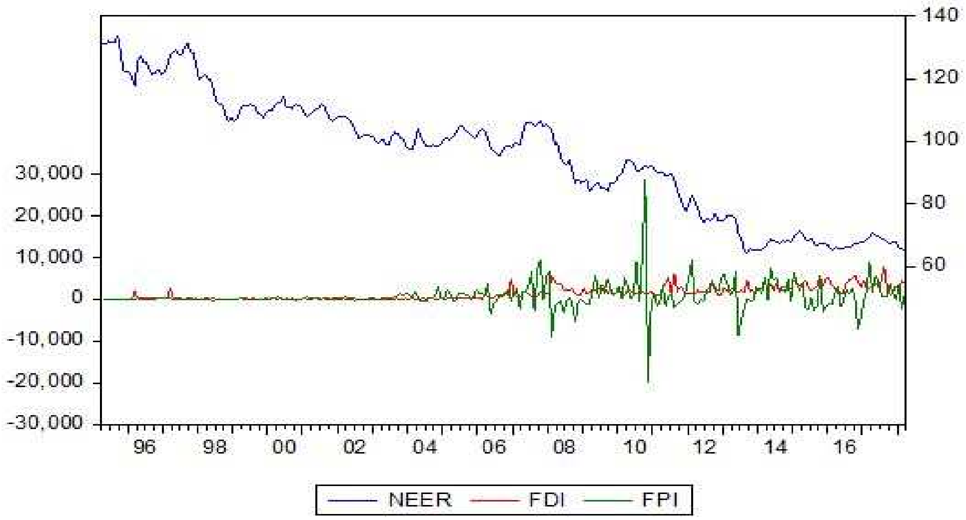

Figure 5.7: Foreign Investment and Exchange Rate in India

Of course, besides the foreign investment there are some other macroeconomic factors which affect the exchange rate in India. One such macroeconomic factor is inflation. Inflation affects exchange rate by influencing the demand and supply side of domestic currency in the foreign exchange market. Changes

[201] Morrissey, O., Udomkerdmongkol, M., and Gorg, H. (2009). Exchange Rates and Outward Foreign Direct Investment: US FDI in Emerging Economies. *Review of Development Economics*, 13(4), 754-764.

[202] Chaudhary, G.M., Shah, S.Z.A., and Bagram, M.M.M. (2012). Do Exchange Rate Volatility Affects Foreign Direct Investment? Evidence from Selected Asian Economies. *Journal of Basic and Applied Scientific Research*, 2(4), 3670-3681.

[203] Klein, M.W., Rosengren, E. (1992). *The Real Exchange Rate and Foreign Direct Investment in the United States: Relative Wealth vs. Relative Wage Effects*. NBER Working Paper, 4192.

in the inflation rate lead to the changes in the exchange rate. Achsani (2010)[204], Mirchandani (2013)[205] and Hsing (2006)[206] argue that countries with higher inflation face depreciation in their currency in relation to the currencies of their trading partners. Similarly a country with consistently lower inflation rate exhibits appreciation of domestic currency as its purchasing power increases in relation to other currencies.

Other two factors which impact exchange rate are import and export. In the case of India since she is importing more goods and services than exporting, more currencies will leave the country which in turn will lead to current account deficit and the consequent depreciation of currency and the fall of exchange rate. On the other hand in countries which have strong export growth and current account surplus, their currencies will appreciate and this will improve their exchange rate (Jhingan 2005)[207], (De Grauwe P. 1988)[208] etc.

However Figure 5.7 and Correlation Matrix (Appendix C.5) betray the above arguments. They show a negative influence of foreign investment on exchange rate in India (Depreciation of Indian Rupee). Hence the relationship between foreign investment and exchange rate is scrutinized with the following econometric analysis.

5.4.1 Relationship between Foreign Investment and Exchange Rate in India - Econometric Analysis

In the light of the above analysis of the influencing factors (i.e., macroeconomic variables) of exchange rate in India, the expected relationship between exchange rate and macroeconomic variables is projected in Table 5.20 by taking NEER as the dependent variable and the macroeconomic variables as the independent

[204] Achsani, N.A. (2010). The Relationship between Inflation and Real Exchange Rate: Comparative Study between ASEAN, the EU and North America. *European Journal of Economics, Finance and Administrative Sciences*, 18, 69-76.

[205] Mirchandani, A. (2013). Analysis of Macroeconomic Determinants of Exchange Rate Volatility in India. *International Journal of Economics and Financial Issues*, 3(1), 172-179.

[206] Hsing, Y. (2008). Application of Monetary Models of Exchange Rate Determination for Poland. *South East European Journal of Economics and Business*, 3(2), 19-24.

[207] Jhingan, M.L. (2005). *Macroeconomics Theory.* 10^{th} Edition, Vrinda Publication Ltd, New-Delhi

[208] De Grauwe P. (1988). *Exchange Rate Variability and the Slowdown in International Trade.* IMF Staff Papers No.35, 35(1), 63-84.

variables.

Table 5.20: Expected Relationship between Exchange Rate and its Linkage with Macroeconomic Variables in India

Dependent Variable	Independent Variables	Expected Relationship
NEER	FDI	Positively related
	FPI	Positively related
	WPI	Negatively related
	EXP	Positively related
	IMP	Negatively related

5.4.2 Model Specification

The impact of foreign investment and other macroeconomic variables on Exchange Rate (NEER) in India formulated in the following model and empirical test.

$$\text{NEER}= f(\text{LFDI, LFPI, LWPI, LEXP, LIMP}, \epsilon)$$

where,
$NEER$ = Nominal Effective Exchange Rate
$LFDI$ = Natural Logarithm of Foreign Direct Investment
$LFPI$ = Natural Logarithm of Foreign Portfolio Investment
$LWPI$ = Natural Logarithm of Whole sale Price Inflation
$LEXP$ = Natural Logarithm of Export
$LIMP$ = Natural Logarithm of Import
ϵ = Error Term

5.4.3 Stationarity Test

The stationary properties of the time series of the variables of the above model are determined by Augmented Dickey- Fuller (ADF) Test. As Table 5.21 manifests all variables are non-stationary at level but become stationary at first difference or all variables are integrated at first difference or same order. In short, all the variables have unit root in their level but became stationary in their first difference.

Table 5.21: Unit Root Test for Exchange Rate and Macroeconomic Variables in India

Variables	Level						I Difference						Result
	Intercept		Intercept & Trend		None		Intercept		Intercept & Trend		None		
	t-stat	p-value	t-stat	p-value	t- stat	p-value	t- stat	p-value	t- stat	p-value	t- stat	p-value	Stationarity
NEER	-1.244568	0.6555	-3.384999	0.0556	-1.994339	0.0444	-12.90082	0.0	-12.88259	0.0	-12.72284	0.0	Stationary at I(1)
LFDI	-1.558809	0.5022	-3.578758	0.0336	0.457969	0.8127	-14.65816	0.0	-14.62863	0.0	-14.65137	0.0	Stationary at I(1)
LFPI	-4.859453	0.0001	-5.020565	0.0002	0.532217	0.8303	-19.30987	0.0	-19.27196	0.0	-19.33417	0.0	Stationary at I(1)
LWPI	-0.7403	0.8331	-1.9952	0.6008	5.388	1	-10.3133	0.0	-10.3127	0.0	-8.287	0.0	Stationary at I(1)
LEXP	-0.586	0.8699	-1.6297	0.7798	-2.269	0.994	-4.6684	0.001	-4.65	0.001	-3.997	0.001	Stationary at I(1)
LIMP	-1.0269	0.7441	-1.1871	0.9104	2.3107	0.9952	-26.673	0.0	-26.656	0.0	-26.3114	0.0	Stationary at I(1)

Source: Compiled by the Researcher

5.4.4 Optimum Lag Length Selection Criteria

The optimum lag length of the model is selected by using Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SC) and Hannan-Quinn Information Criterion (HQ) on the basis of the minimum value of each criterion. And as can be seen in Table 5.22 the optimum lag length is 2 based on AIC, FPE, SC and HQ.

Table 5.22: VAR Lag Order Selection Criteria for Exchange Rate and Macroeconomic Variables in India

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-579.8409	NA	4.72e-06	4.762934	4.848430	4.797359
1	942.1545	2957.373	2.67e-11	-7.318329	-6.719858	-7.077353
2	1044.420	193.7232	1.56e-11*	-7.857077*	-6.745630*	-7.409549*
3	1073.826	54.26837*	1.65e-11	-7.803462	-6.17904	-7.149382
4	1094.878	37.82549	1.87e-11	-7.681935	-5.544537	-6.821304
5	1112.587	30.95511	2.17e-11	-7.533229	-4.882856	-6.466047
6	1137.814	42.86570	2.39e-11	-7.445645	-4.282297	-6.171912
7	1158.742	34.53896	2.72e-11	-7.323105	-3.646782	-5.84282
8	1189.015	48.48650	2.88e-11	-7.276546	-3.087248	-5.589711

** indicates lag order selected by the criterion*

LR: Sequential Modified LR Test Statistic (each test at 5% level)

FPE: Final Prediction Error

AIC: Akaike Information Criterion

SC: Schwarz Information Criterion

HQ: Hannan- Quinn Information Criterion

5.4.5 Johansen Co-integration Test

Johansen Co-integration Test is used for testing the long run relationship or co-integration among exchange rate and macroeconomic variables in India. On the basis of two likelihood estimators - Trace Test and Maximum Eigenvalue Test the two co-integrated equations are at 5 percent level as is seen in Table 5.23. Therefore, it can be inferred that there exists a long run relationship or co-integration between macroeconomic variables and exchange rate in India.

Table 5.23: Johansen Co-integration Test for Exchange Rate and its Linkage with Macroeconomic Variables in India

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistic**	**0.05 Critical Value**	**Prob.****
None *	0.190712	143.4856	95.75366	0.0000
At most 1 *	0.152767	89.31588	69.81889	0.0007
At most 2	0.091134	46.87619	47.85613	0.0616
At most 3	0.064590	22.41342	29.79707	0.2761
At most 4	0.017426	5.320335	15.49471	0.7739
At most 5	0.003198	0.819940	3.841466	0.3652
Trace test indicates 2 cointegrating eqn(s) at the 0.05 level				
** denotes rejection of the hypothesis at the 0.05 level*				
***MacKinnon-Haug-Michelis (1999) p-values*				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**0.05 Critical Value**	**Prob.****
None *	0.190712	54.16975	40.07757	0.0007
At most 1 *	0.152767	42.43969	33.87687	0.0038
At most 2	0.091134	24.46277	27.58434	0.1194
At most 3	0.064590	17.09308	21.13162	0.1677
At most 4	0.017426	4.500394	14.26460	0.8031
At most 5	0.003198	0.819940	3.841466	0.3652
Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level				
** denotes rejection of the hypothesis at the 0.05 level*				
***MacKinnon-Haug-Michelis (1999) p-values*				

Source: Compiled by the Researcher

5.4.6 VECM Model

Since it is seen that there is co-integrating relationship between macroeconomic variables and exchange rate in India, Vector Error Correction Model (VECM) is used to estimate their short run dynamics, long run relationship and the speed of adjustment towards long run equilibrium (Appendix C.6).

5.4.7 Normalized Co-integrating Coefficients

The Normalized Co-integration Coefficient values of the variables expressed in Table 5.24 reveal that in the long run Foreign Direct Investment (FDI), Foreign Portfolio Investment (FPI) and Export (EXP) have positive impact on Exchange Rate (NEER) i.e., in the appreciation of Indian rupee while Inflation (Wholesale Price Index - WPI) and Import (IMP) have negative impact on exchange rate in India, i.e., depreciation of Indian rupee.

Table 5.24: Normalized Co-integrating Coefficients (Long Run Coefficient) of Exchange Rate and Macroeconomic Variables in India

NEER	LFDI	LFPI	LWPI	LEXP	LIMP
1.000000	-5.405585	-85.25537	113.2436	-82.99756	61.42720
	(2.28038)	(15.2110)	(15.7121)	(17.2283)	(12.6341)
* *(standard error in parentheses)*					

Source: Compiled by the Researcher

The estimated equation by co-integration is given in Equation 5.5. The signs of the normalized co-integrating coefficients are reversed to enable their proper interpretation.

$$NEER = 5.4055LFDI + 85.255LFPI - 113.24LWPI + 82.99LEXP - 61.42LIMP \tag{5.5}$$

The result of VEC Granger Causality/ Block Exogeneity Wald Test, shown in Table 5.25, reveals that in the short run the role of Foreign Portfolio Investment (FPI) and Export (EXP) are statistically significant in influencing the Exchange Rate (NEER) while the impact of Foreign Direct Investment (FDI),

Table 5.25: VEC Granger Causality/ Block Exogeneity Wald Test of Exchange Rate and Macroeconomic Variables in India

Excluded	Chi-sq	df	Prob.
D(LFDI)	0.374172	2	0.8294
D(LFPI)	4.726415	2	0.0941*
D(LWPI)	3.432224	2	0.1798
D(LEXP)	7.019810	2	0.0299**
D(LIMP)	0.131187	2	0.9365
All	**18.26422**	**10**	**0.0507**
Dependent Variable: D(NEER)			

* Significant at 10% **Significant at 5%

Import (IMP) and Inflation (WPI) are seen statistically insignificant.

VECM Estimated Model

$$\begin{aligned}D(NEER) = C(1) &* (NEER(-1) - 75.19 * LFPI(-1) + 168.06 \\ &* LWPI(-1) - 179.91 * LEXP(-1) + 123.04 \\ &* LIMP(-1) + 334.98) + C(2) * (LFDI(-1) + 1.86 \\ &* LFPI(-1) + 10.14 * LWPI(-1) - 17.92 \\ &* LEXP(-1) + 11.39 * LIMP(-1) - 17.17) \\ &+ C(3) * D(NEER(-1)) + C(4) * D(NEER(-2)) + C(5) \\ &* D(LFDI(-1)) + C(6) * D(LFDI(-2)) + C(7) * D(LFPI(-1)) \\ &+ C(8) * D(LFPI(-2)) + C(9) * D(LWPI(-1)) + C(10) \\ &* D(LWPI(-2)) + C(11) * D(LEXP(-1)) + C(12) \\ &* D(LEXP(-2)) + C(13) * D(LIMP(-1)) \\ &+ C(14) * D(LIMP(-2)) + C(15)\end{aligned} \tag{5.6}$$

Error Correction Term (ECT) is used to find out the speed of adjustment from the short run equilibrium to the long run equilibrium of the model. As can be seen in the Table 5.26, ECT or C(1) is negatively signed and significant indicating that the speed of adjustment between the short run dynamics and the long run equilibrium relationship is at the rate of 3 percent. It shows that in India there is a long run causal relationship between exchange rate, foreign investment and other macroeconomic variables.

Table 5.26: Estimates of Error Correction Term for Exchange Rate

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.036308	0.013401	-2.709471	0.0068***
C(2)	0.325858	0.140426	2.320488	0.0205
C(3)	0.187137	0.064917	2.882711	0.004
C(4)	-0.085077	0.063858	-1.332288	0.183
C(5)	-0.100312	0.20511	-0.489062	0.6249
C(6)	-0.083982	0.191956	-0.437504	0.6618
C(7)	-2.458714	1.127046	-2.181557	0.0293
C(8)	-1.637736	0.884481	-1.851634	0.0643
C(9)	-31.14818	18.77269	-1.659228	0.0973
C(10)	-3.945411	18.8837	-0.208932	0.8345
C(11)	3.961157	1.706073	2.321799	0.0204
C(12)	3.483321	1.469043	2.37115	0.0179
C(13)	0.037566	1.464649	0.025648	0.9795
C(14)	-0.484585	1.378807	-0.351452	0.7253
C(15)	-0.129917	0.12835	-1.012211	0.3116

*** Significant at 1%

5.4.8 Variance Decomposition Analysis

Variance Decomposition Analysis used to find out the breakdown of the forecast error variance for a specific time horizon, is presented in Table 5.27. It exhibits that in the long run (i.e., after a period of 10 months), 84 percentage of fluctuation of Exchange Rate (NEER) is by itself and 16 percentage by other macroeconomic factors i.e., 8% by FPI, 4% by WPI, 2.73% by FDI, 1% by EXP and 0.14% by IMP. In short FPI and inflation are seen as the main factors which are responsible for the fluctuation of exchange rate in India.

Table 5.27: Variance Decomposition of Exchange Rate in India

Period	S.E.	NEER	LFDI	LFPI	LWPI	LEXP	LIMP
1	1.615456	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	2.587077	96.63058	0.446372	0.379101	0.359021	2.148805	0.036116
3	3.273508	93.47083	0.901443	1.233249	0.999500	3.097849	0.297128
4	3.839967	91.29886	1.361046	2.810571	1.638810	2.569964	0.320751
5	4.355461	89.51567	1.717363	4.126906	2.184785	2.171669	0.283604
6	4.815432	88.11741	1.995372	5.050362	2.711877	1.877833	0.247142
7	5.241639	86.88562	2.235421	5.890951	3.149250	1.626028	0.212732
8	5.641822	85.85724	2.432835	6.602764	3.495057	1.427600	0.184501
9	6.016079	85.02796	2.595352	7.161462	3.781571	1.271317	0.162339
10	6.370010	84.32660	2.732768	7.636149	4.015779	1.143854	0.144845

Source: Compiled by the Researcher

5.4.9 Impulse Response Analysis

Impulse Response Analysis (IRA) is used to indicate the positive or negative direction or the nature of the variation of the macroeconomic variables. Figure

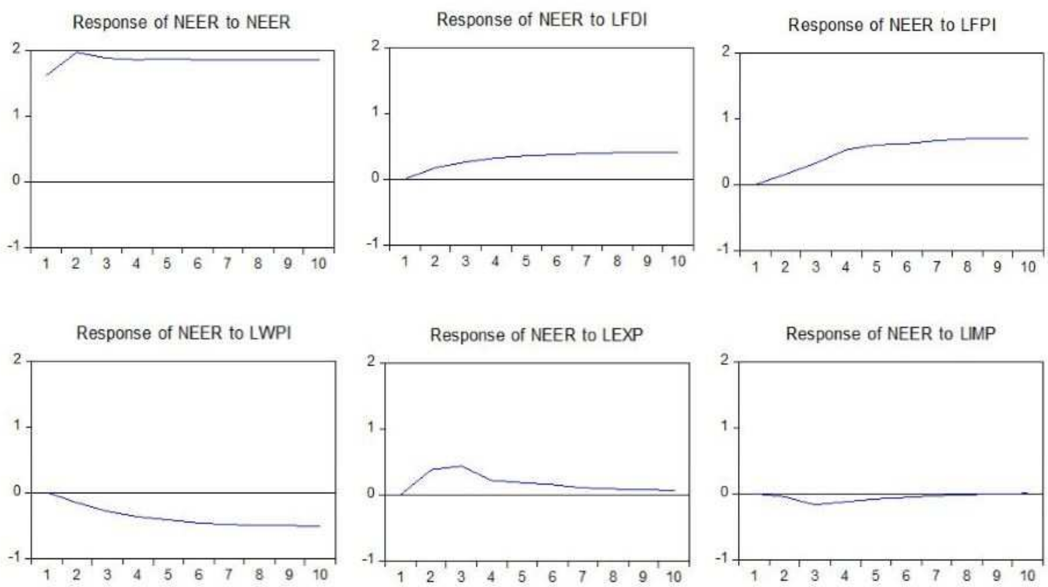

Figure 5.8: Impulse Response of Exchange Rate

5.8 depicts the impulse response of exchange rate for the one unit standard deviation shock in the macroeconomic variables in India. If a positive shock is given to the foreign investment inflows (FDI and FPI) and export i.e., it will lead to the appreciation of the exchange rate and this shock will persists upto 10 months. This means that additional foreign investment flows help to raise or appreciate the exchange rate in India. At the same time one standard deviation shock to inflation and import cause depreciation of the exchange rate in India.

Thus it may be concluded that foreign investment could stabilize the exchange rate and produce a positive impact on the Indian economy. Hence it is yet another positive impact of foreign investment on Indian economy.

5.5 Impact of Foreign Investment on the Economic Growth of India

The relevance and importance of foreign investment must be judged ultimately by its contribution to the economic growth of the host countries which is usually measured by the Index of Industrial Production (IIP)[209]. Since the major hurdle in the path of the economic growth in India is capital scarcity, the potential of foreign investment, which is nothing other than capital flows, is self-explanatory and self-evident for its economic growth. Thus by bringing huge amount of non-debt capital foreign investment directly influences the economic growth. Besides, foreign investment influences economic growth indirectly too by aiding the other agents of the economic growth. Similarly, all the positive contributions of foreign investment to balance of payments, foreign exchange reserves, exchange rate etc. will definitely aid economic growth. Foreign investment can even neutralize the obstacles of economic growth like interest rate and inflation by way of its very presence. For example government will be forced to maintain a moderate interest rate and a moderate inflation in the country to attract foreign investment as high interest rate or high inflation rate will repel foreign investors from the country.

Figure 5.9 and the Correlation Matrix (Appendix C.7) show the positive

[209]Index of Industrial Production (IIP) is used as a proxy to measure the growth rate in real sector. Industrial production index measures monthly developments of real activity in the industrial sector, comprising mining and quarrying, manufacturing, and electricity and it is calculated according to production quantity of a sample representing most domestic industries, and weighted by the production values for industry in base year (2004-05), according to the production survey carried by Department of Statistics. There are some other indicators also that explicitly reflect the industrial activities in the economy. In this way economic growth can be defined as an increase in the capacity of an economy to produce goods and services within a specific period of time.

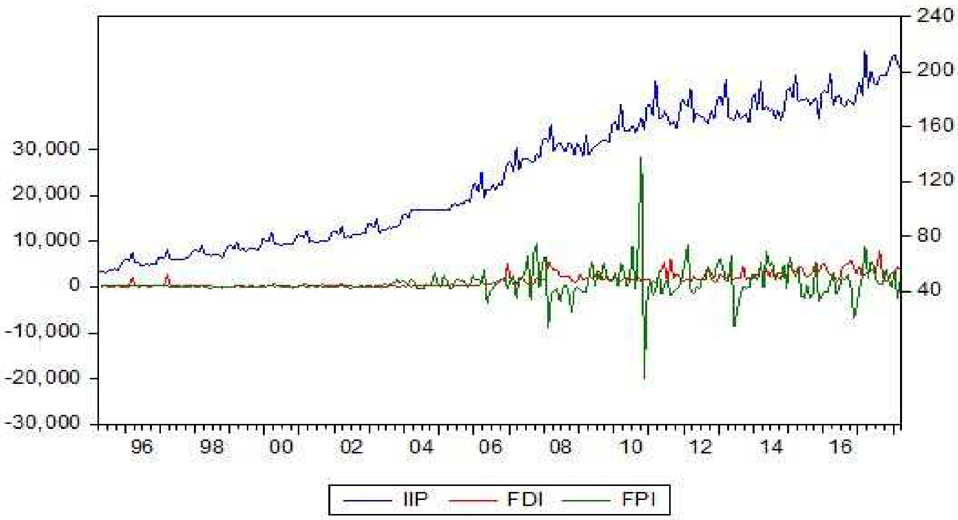

Figure 5.9: Foreign Investment and Economic Growth in India

influence of foreign investment on the economic growth of India. The empirical finding also reinforces that foreign investment (FDI and FPI) has a significant relation with the economic growth of Indian economy.

Of course other than foreign investment there are also other macroeconomic variables which influence the economic growth. For example, interest rate and economic growth are negatively associated (Barro and Becker 1989)[210]. Semuel and Nurina (2015)[211] also argued that there is a negative association between interest rate and economic growth. Foreign investment in India helps to maintain a moderate or balanced interest rate by two ways. India which is keen to attract foreign investment cannot hike interest rate arbitrarily because such an attempt will repel foreign investment from the country. At the same time reasonable interest rate is necessary to control inflation because high rate of inflation not only curb economic growth but also prevent easy flow of foreign investment to the country.

Similarly, foreign investment has the potential to boost export which is a necessary condition for economic growth. There is a reciprocal relationship between foreign investment and export i.e., increase in export will attract more

[210] Barro, R.J., and Becker, G.S. (1989). Fertility Choice in a Model of Economic Growth. *Econometrica*, 57(2), 481-501.

[211] Semuel, H., and Nurina, S. (2015), *Analysis of the Effect of Inflation, Interest Rates, and Exchange Rates on Gross Domestic Product (GDP) in Indonesia*. International Conference on Global Business, Economics, Finance and Social Sciences (GB15 - Thai Conference), Bangkok, Thailand.

foreign investment and increase in foreign investment leads to more export and the both contribute to the economic growth, (Jordan and Eita 2007)[212], (Awokuse 2007)[213], (Konya 2006)[214] etc. Though it is not possible to attribute

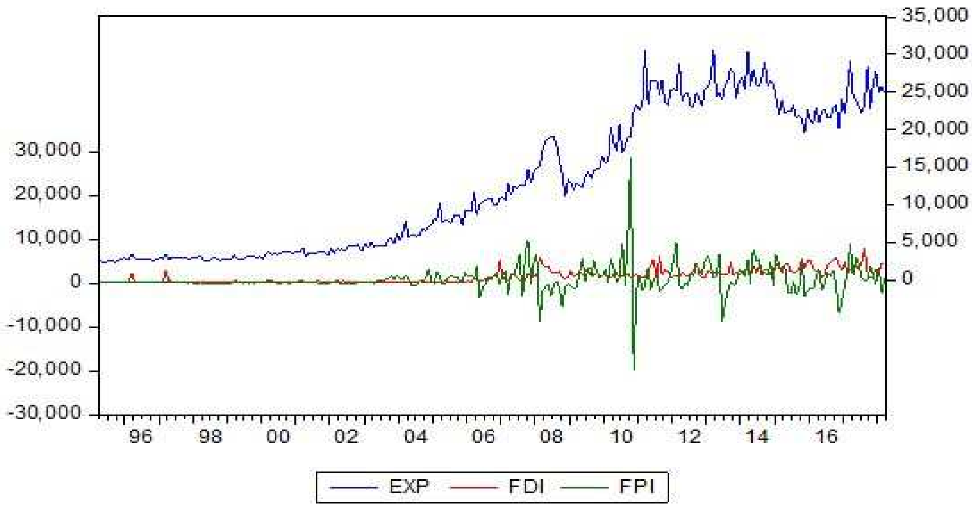

Figure 5.10: Relationship between Foreign Investment and Export

the full credit of the increase in export in India exclusively to the foreign investment, since Figure 5.10 shows a trend line between foreign investment and export, the existence of a positive relationship between them can be inferred. It can be seen that corresponding to the increase of foreign investment there is a corresponding increase of export (Appendix C.9).

In the same manner in the context of import also, especially certain types of import like import of capital goods which is a necessary condition for economic growth, foreign investment has an important role to play. Foreign investment and the consequent foreign capital it brings relieves India not only from the burden of import but also make import easy. In this way, foreign investment in India contributes to her economic growth. The Figure 5.11, illustrates this positive relationship between foreign investment and import in India and shows the increase of import corresponding to the increases of foreign investment[215].

[212]Jordaan, A.C., and Eita, J.H. (2007). Export and Economic Growth in Namibia: A Granger Causality Analysis. *South African Journal of Economics*, 75 (3), 540-547.

[213]Awokuse, T.O. (2007). Causality between Exports, Imports, and Economic Growth: Evidence from Transition Economies. *Economics Letters*, 94 (3), 389-395.

[214]Konya, L. (2006). Exports and Growth: Granger Causality Analysis on OECD Countries with Panel Data Approach. *Economic Modelling*, 23(6), 978-992.

[215]It is not arguing that high rate of import is an indication of economic growth. But so far as developing

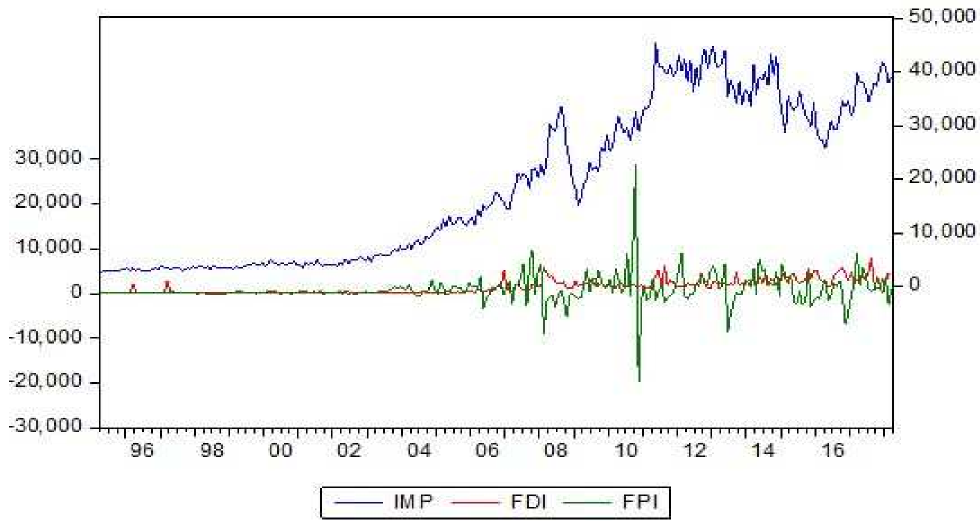

Figure 5.11: Relationship between Foreign Investment and Import

Exchange rate stability is another factor which is essential for economic growth and the role of foreign investment in stabilizing the exchange rate is already examined. It is also seen in the previous section that how foreign investment strengthens the domestic currency and brings down the price of imported goods and thereby stabilizes the exchange rate and thus boosts the economic growth.

Yet another factor which influences - economic growth - generally adversely - is inflation which is partially a byproduct of foreign investment. The relationship between economic growth and inflation, is a controversial question. Though higher level of inflation may adversely affect economic growth, inflation at some low levels, may be positively correlated with growth. High inflation is always correlated with increased price variability, leading uncertainty about the future profitability of investment projects and this brings down the lower levels of investment and dampens the economic growth. So their expected relationship is negative (Bruno and Easterly 1998)[216]. Therefore all the attempts by the government to control inflation to attract foreign investment indirectly boosts economic growth also.

countries are concerned import is an inescapable fact and is highly necessary too for their economic growth. The relevance of foreign investment with regard to import is that it facilitates imports without much burden and in this way indirectly helps economic growth.

[216]Bruno, M., and Easterly, W.(1998). Inflation Crises and Long-run Growth. *Journal of Monetary Economics*, 41(1), 3-26.

In the aforesaid ways foreign investment is an aid and ally of economic growth in India also.

5.5.1 Relationship between Foreign Investment and Economic Growth - Econometric Analysis

The web of this relationship between foreign investment and economic growth in the Indian context is studied with the help of the following model taking Index of Industrial Production as the dependent variable and other factors of economic growth as the independent variables and their likely relationship is expressed in Table 5.28.

Table 5.28: Expected Relationship between Economic Growth (IIP) and its Linkage with Macroeconomic Variables in India

Dependent Variable	Independent Variables	Expected Relationship
IIP	FDI	Positively related
	FPI	Positively related
	IR	Negatively related
	NEER	Negatively related
	WPI	Negatively related
	EXP	Positively related

5.5.2 Model Specification

On the basis of the above relationship between foreign investment (FDI and FPI) and other macroeconomic variables with Economic Growth (IIP) the following model is formulated.

$$\text{IIP} = f(\text{LFDI, LFPI, LIR, LNEER, LWPI, LEXP}, \epsilon)$$

where,
IIP = Index of Industrial Production
$LFDI$ = Natural Logarithm of Foreign Direct Investment
$LFPI$ = Natural Logarithm of Foreign Portfolio Investment

LIR = Natural Logarithm of Interest Rate
$LNEER$ = Natural Logarithm of Nominal Effective Exchange Rate
$LWPI$ = Natural Logarithm of Wholesale Price Index
$LEXP$ = Natural Logarithm of Export
ϵ = Error Term

5.5.3 Stationarity Test

The stationary properties of the data are studied using Augmented Dickey-Fuller (ADF) Test. Table 5.29 shows that all variables are non-stationary in their level. But when they are converted into first difference they become stationary. Hence it is possible to conclude that all the variables become stationary at first difference and they are integrated of order one I(1).

Table 5.29: Unit Root Test for Economic Growth (IIP) and Macroeconomic Variables in India

Variables	Level						I Difference						Result
	Intercept		Intercept & Trend		None		Intercept		Intercept & Trend		None		
	t-stat	p-value	t-stat	p-value	t- stat	p-value	t- stat	p-value	t- stat	p-value	t- stat	p-value	Stationarity
IIP	-0.400662	0.9057	-1.713438	0.7427	2.228	0.994	-3.954859	0.002	-3.945539	0.0117	-2.83	0.004	Stationary at I(1)
LFDI	-1.558809	0.5022	-3.578758	0.0336	0.457969	0.8127	-14.65816	0.0	-14.62863	0.0	-14.65137	0.0	Stationary at I(1)
LFPI	-4.859453	0.0001	-5.020565	0.0002	0.532217	0.8303	-19.30987	0.0	-19.27196	0.0	-19.33417	0.0	Stationary at I(1)
LIR	-4.292291	0.0006	-4.28032	0.0039	-1.023218	0.2752	-16.36911	0.0	-16.34742	0.0	-16.39664	0.0	Stationary at I(1)
LNEER	-0.8897	0.7905	-2.8436	0.1831	-1.8436	0.0622	-12.8876	0.0	-12.8623	0.0	-12.7055	0.0	Stationary at I(1)
LWPI	-0.7403	0.8331	-1.9952	0.6008	5.388	1	-10.3133	0.0	-10.3127	0.0	-8.287	0.0	Stationary at I(1)
LEXP	-0.586	0.8699	-1.6297	0.7798	-2.269	0.994	-4.6684	0.001	-4.65	0.001	-3.997	0.001	Stationary at I(1)

Source: Compiled by the Researcher

5.5.4 Optimum Lag Length Selection Criteria

Akaike Information Criterion (AIC), Schwartz Information Criterion (SC), Final Prediction Error (FPE), LR Statistics (LR) and Hannan-Quinn Information Criterion (HQ) are used for determining the best lag length of the model and their estimated results are given in Table 5.30. The lag lengths are chosen based on the lowest values over the lags considered (allowed for a maximum of eight lags in this case). As per the Akaike Information Criterion (AIC) lag three is found optimal for the model.

Table 5.30: VAR Lag Order Selection Criteria for Economic Growth (IIP) and Macroeconomic Variables in India

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-595.8723	NA	3.17e-07	4.901401	5.001146	4.941564
1	1025.628	3137.538	8.89e-13	-7.883158	-7.085197*	-7.561856
2	1141.328	217.2902	5.18e-13	-8.425435	-6.929257	-7.822993*
3	1194.067	96.04459	5.03e-13*	-8.455831*	-6.261437	-7.572251
4	1232.488	67.78251*	5.51e-13	-8.369819	-5.477208	-7.205099
5	1261.519	49.56509	6.53e-13	-8.207469	-4.616642	-6.76161
6	1296.916	58.41981	7.37e-13	-8.096878	-3.807834	-6.369879
7	1330.327	53.23967	8.49e-13	-7.970135	-2.982874	-5.961997
8	1368.647	58.88189	9.44e-13	-7.883305	-2.197828	-5.594028

** indicates lag order selected by the criterion*

LR: Sequential Modified LR Test Statistic (each test at 5% level)

FPE: Final Prediction Error

AIC: Akaike Information Criterion

SC: Schwarz Information Criterion

HQ: Hannan- Quinn Information Criterion

5.5.5 Johansen Co-integration Test

Since all the variables are co-integrated in the first order I(1), Johansen Co-integration test is used to analyse the long run relationship among economic growth and the macroeconomic variables of the Indian economy. The result of this test given in Table 5.31 shows that both the Trace and Maximum Eigenvalue Test accept the presence of long run relationship or co-integrating vectors among the variables of the model. The Trace Statistics reveals that the existence of four co-integrated equation at five percent level of significance and Maximum Eigenvalue reveals the existence of one co-integrated equation at five percent level of significance. This indicates the presence of a long run relationship between economic growth and other macroeconomic variables of India including foreign investment.

5.5.6 VECM Model

Since the results of the Co-integration Test indicates that the variables have co-integrated or long run relationship, Vector Error Correction Model (VECM) is

Table 5.31: Johansen Co-integration Test for Economic Growth (IIP) and its Linkage with Macroeconomic Variables in India

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistic**	**0.05 Critical Value**	**Prob.****
None *	0.226325	177.2967	125.6154	0.0000
At most 1 *	0.138020	112.1195	95.75366	0.0023
At most 2 *	0.096936	74.39461	69.81889	0.0206
At most 3 *	0.076485	48.49619	47.85613	0.0435
At most 4	0.062170	28.28591	29.79707	0.0739
At most 5	0.038351	11.98262	15.49471	0.1578
At most 6	0.008037	2.049723	3.841466	0.1522
Trace test indicates 4 cointegrating eqn(s) at the 0.05 level				
** denotes rejection of the hypothesis at the 0.05 level*				
***MacKinnon-Haug-Michelis (1999) p-values*				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**0.05 Critical Value**	**Prob.****
None *	0.226325	65.17725	46.23142	0.0002
At most 1	0.138020	37.72485	40.07757	0.0899
At most 2	0.096936	25.89842	33.87687	0.3270
At most 3	0.076485	20.21028	27.58434	0.3268
At most 4	0.062170	16.30329	21.13162	0.2076
At most 5	0.038351	9.932902	14.26460	0.2164
At most 6	0.008037	2.049723	3.841466	0.1522
Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level				
** denotes rejection of the hypothesis at the 0.05 level*				
***MacKinnon-Haug-Michelis (1999) p-values*				

Source: Compiled by the Researcher

used to analyze the long run causality and short run dynamics of macroeconomic variables and economic growth in India (Appendix C.8). In the presence of co-integration, there always exists a corresponding error correction representation, captured by the Error Correction Term (ECT) which captures the long run adjustment of co-integration variables.

Table 5.32: Normalized Co-integrating Coefficients (Long Run Coefficient) of Economic Growth (IIP) and Macroeconomic Variables in India

IIP	LFDI	LFPI	LIR	LNEER	LWPI	LEXP
1.000000	-13.72089	-47.18273	4.878619	8.954999	-70.74676	-2.692716
	(1.72640)	(13.0643)	(2.44605)	(22.2014)	(26.9959)	(6.96624)
* *(standard error in parentheses)*						

Source: Compiled by the Researcher

5.5.7 Normalized Co-integrating Coefficients

The Normalized Co-integration Coefficients is depicted in Table 5.32 and the estimated equation by Co-integration is given in Equation 5.7. Here signs of the Normalized Co-integrating Coefficients are reversed to enable proper interpretation.

$$IIP = 13.72LFDI + 47.18LFPI - 4.8LIR - 8.95LNEER + 70.74LWPI + 2.69LEXP \tag{5.7}$$

Accordingly it can be seen that in the long run Foreign Direct Investment (FDI), Foreign Portfolio Investment (FPI), Export (EXP) and Inflation (WPI) have significant positive effect on the Index of Industrial Production (IIP) which represents Economic Growth, while Interest Rate (IR) and Exchange Rate (NEER) are found negatively related to Index of Industrial Production (IIP) in India.

The result of VEC Granger Causality Block Exogeneity Wald Test, given in Table 5.33, shows that in the short run Foreign Direct Investment (FDI), Foreign Portfolio Investment (FPI) and Inflation (WPI) have statistically significant effect on the Economic Growth (IIP) in India, while Export (EXP) and Exchange Rate (NEER) have only insignificant effect on economic growth.

The coefficient of the Error Correction Term (ECT) or C(1) of the model is -0.21, and is significant (Table 5.34). It implies that the system corrects its previous periods disequilibrium at a speed of approximately 21 percent monthly. Since the Error Correction Term (ECT) is negative in sign and significant it is possible to say that there is a long run causality running from economic growth and macroeconomic variables of Indian economy including foreign investment.

Table 5.33: VEC Granger Causality/Block Exogeneity Wald Test of Economic Growth (IIP) and Macroeconomic Variables in India

Excluded	Chi-sq	df	Prob.
D(LFDI)	13.46931	3	0.0037***
D(LFPI)	17.45036	3	0.0006***
D(LIR)	4.372607	3	0.2239
D(LNEER)	4.100970	3	0.2508
D(LWPI)	19.68391	3	0.0002***
D(LEXP)	5.650352	3	0.1299
All	**73.34587**	**18**	**0.0000**
Dependent Variable: D(IIP)			

*** Significant at 1%

VECM Estimated Model

$$\begin{aligned} D(IIP) = C(1) &* (IIP(-1) - 13.72 * LFDI(-1) - 47.18 \\ &* LFPI(-1) + 4.87 * LIR(-1) + 8.95 \\ &* LNEER(-1) - 70.74 * LWPI(-1) - 2.69 \\ &* LEXP(-1) + 745.83) + C(2) * D(IIP(-1)) \\ &+ C(3) * D(IIP(-2)) + C(4) * D(IIP(-3)) + C(5) \\ &* D(LFDI(-1)) + C(6) * D(LFDI(-2)) + C(7) \\ &* D(LFDI(-3)) + C(8) * D(LFPI(-1)) + C(9) \\ &* D(LFPI(-2)) + C(10) * D(LFPI(-3)) + C(11) \\ &* D(LIR(-1)) + C(12) * D(LIR(-2)) + C(13) \\ &* D(LIR(-3)) + C(14) * D(LNEER(-1)) + C(15) \\ &* D(LNEER(-2)) + C(16) * D(LNEER(-3)) + C(17) \\ &* D(LWPI(-1)) + C(18) * D(L_WPI(-2)) + C(19) \\ &* D(LWPI(-3)) + C(20) * D(LEXP(-1)) + C(21) \\ &* D(LEXP(-2)) + C(22) * D(LEXP(-3)) + C(23) \end{aligned} \tag{5.8}$$

Table 5.34: Estimates of Error Correction Term for Economic Growth (IIP)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.218551	0.052478	-4.164643	0.000***
C(2)	-0.42179	0.080819	-5.218941	0.000
C(3)	0.098329	0.083632	1.175735	0.2399
C(4)	0.243067	0.072841	3.33697	0.0009
C(5)	-2.854222	0.801999	-3.558885	0.0004
C(6)	-1.220805	0.787036	-1.551143	0.1211
C(7)	-0.85604	0.662741	-1.291666	0.1967
C(8)	-12.22075	3.549151	-3.443289	0.0006
C(9)	-5.32678	3.484721	-1.52861	0.1266
C(10)	2.28673	3.026288	0.755622	0.45
C(11)	0.756088	1.277579	0.591813	0.5541
C(12)	2.604495	1.302818	1.999124	0.0458
C(13)	1.534783	1.277293	1.20159	0.2297
C(14)	-34.71733	21.72305	-1.598179	0.1102
C(15)	-13.61986	21.49926	-0.633504	0.5265
C(16)	-12.29221	21.62851	-0.568334	0.5699
C(17)	-285.521	64.33492	-4.43804	0.000
C(18)	107.3574	71.40453	1.503509	0.1329
C(19)	22.94736	63.36417	0.36215	0.7173
C(20)	-8.718767	4.390075	-1.986018	0.0472
C(21)	-10.33829	5.074745	-2.037205	0.0418
C(22)	-4.750767	4.65878	-1.019745	0.308
C(23)	1.220936	0.473279	2.579739	0.01

*** Significant at 1%

5.5.8 Variance Decomposition Analysis

Variance Decomposition Analysis is used to estimate the proportion of variance of economic growth affected by macroeconomic variables in India in the long run and Table 5.35 shows the variance decomposition of the dependent variable of economic growth for a period of ten months time horizon. It is seen that 70 percent of IIP change is contributed by its own innovative shock and the rest 30 percent variability is explained by other macroeconomic determinants of IIP. Further shock in Foreign Direct Investment (FDI) and Foreign Portfolio Investment (FPI) contributes to the 12 and 6 percent variation of IIP respectively. Variable Inflation (WPI) contributes to 3 percent and variable Export (EXP) contributes to 4 percent variation of IIP. But Exchange Rate (NEER) and Interest Rate (IR) are found having only minor role for explaining the variation of IIP. Therefore it is concluded that in the long run Foreign Investment (FDI and FPI) is the crucial determining factor of the Economic Growth (IIP) of India.

Table 5.35: Variance Decomposition of Economic Growth (IIP)

Period	S.E.	IIP	LFDI	LFPI	LIR	LNEER	LWPI	LEXP
1	5.262190	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	5.760470	91.24725	0.002070	0.488463	0.024989	0.302784	6.718749	1.215698
3	6.698735	86.94521	1.575240	1.185629	0.299028	0.427670	5.828881	3.738342
4	7.559468	84.40898	2.073112	2.393723	0.270699	1.069863	6.100710	3.682916
5	7.961444	80.35884	4.690919	2.497670	0.267317	1.246118	6.822009	4.117127
6	8.610937	77.27507	6.682855	4.012975	0.230588	1.543687	5.983140	4.271683
7	9.058479	74.97494	8.509452	4.996639	0.220975	1.642290	5.633187	4.022519
8	9.464110	73.24336	10.17622	5.515907	0.209441	1.637771	5.257544	3.959760
9	9.919428	71.96484	11.18658	6.339650	0.218574	1.646456	4.832091	3.811808
10	10.30806	70.98877	12.09701	6.828243	0.225434	1.623194	4.564442	3.672904

Source: Compiled by the Researcher

5.5.9 Impulse Response Analysis

Impulse Response Analysis is used to identify whether macroeconomic variables' impact is positive or negative to the economic growth and also to detect the dynamic behavior of the variables. As can be seen in Figure 5.12 when a one standard deviation of impulse in Foreign Direct Investment (FDI) and Foreign Portfolio Investment (FPI) is found positive towards Economic Growth (IIP), Exchange Rate (NEER), Inflation (WPI) and Export (EXP) are found negative towards IIP in the long run. But it is seen that Interest Rate (IR) has no impact on Economic Growth (IIP) during the entire period.

All these lead to the conclusion that both form of foreign investment i.e., FDI and FPI impact the economic growth directly and indirectly - directly by bringing huge amount of non-debt capital and indirectly by impacting the

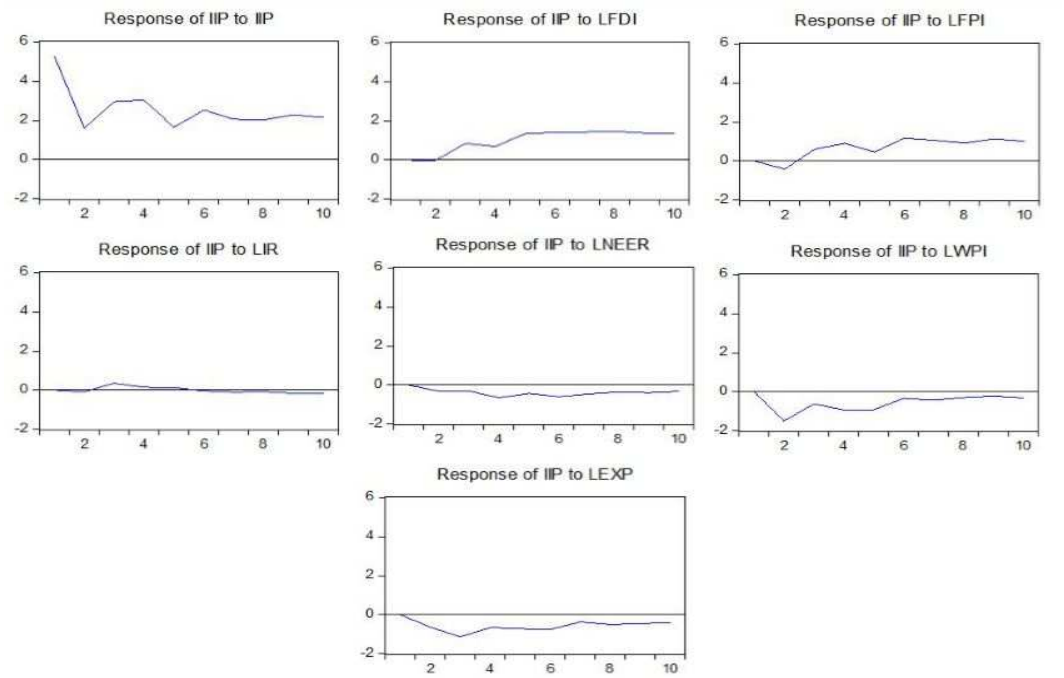

Figure 5.12: Impulse Response of Economic Growth (IIP)

other variables which help the economic growth. And this is the most crucial testimony of the positive impact of foreign investment on Indian economy.

5.6 Impact of Foreign Investment on the External Debt Burden of India

The most distinguishable characteristic of foreign investment is that it is non-debt capital and obviously it is this characteristic of foreign investment which tempts India like all other developing countries to go after foreign investment. Therefore an analysis of the impact of foreign investment on the macroeconomic variables of the Indian economy cannot be completed without examining how this quality of foreign investment operates in the Indian economy.

The striking feature of the capital inflows into India since 1991 is the change in its composition from debt to non-debt creating capital. External commercial borrowing, which had been the major source of foreign capital inflows during the eighties and which created repayment burden, became less important during the nineties when the dominant forms of foreign investment became Foreign

Table 5.36: Non Debt Creating and Debt Creating Capital Inflows

Year	Non-Debt Creating Inflows (US $ Million)	Debt Creating Capital Inflows (US $ Million)	Total Capital Inflows	Percentage of Non-debt Creating Capital Flows of the Total Capital Flows	Percentage of Debt Creating Capital Flows of the Total Capital Flows
1991-92	151	21625	21776	0.69	99.31
1992-93	589	22292	22881	2.57	97.43
1993-94	4609	21791	26400	17.46	82.54
1994-95	5753	17948	23701	24.27	75.73
1995-96	5629	17784	23413	24.04	75.96
1996-97	7817	25738	33555	23.3	76.7
1997-98	9169	26211	35380	25.92	74.08
1998-99	5743	23669	29412	19.53	80.47
1999-00	12121	23719	35840	33.82	66.18
2000-01	17650	33550	51200	34.47	65.53
2001-02	15389	25471	40860	37.66	62.34
2002-03	13928	30526	44454	31.33	68.67
2003-04	32540	38865	71405	45.57	54.43
2004-05	46899	44844	91743	51.12	48.88
2005-06	77082	61113	138195	55.78	44.22
2006-07	132360	91831	224191	59.04	40.96
2007-08	268408	137982	406390	66.05	33.95
2008-09	166348	127353	293701	56.64	43.36
2009-10	197659	135563	333222	59.32	40.68
2010-11	283556	198949	482505	58.77	41.23
2011-12	231299	230894	462193	50.04	49.96
2012-13	208060	238812	446872	46.55	53.45
2013-14	238379	242885	481264	49.53	50.47
2014-15	301195	213449	514644	58.52	41.48
2015-16	271266	209207	480473	56.45	43.55
2016-17	297734	204201	501935	59.31	40.69
2017-18	354503	242784	597287	59.35	40.65
Total	**3205836**	**2709056**	**5914892**		

Source: Handbook of Statistics on Indian Economy: 2018, RBI DATABASE

Portfolio Investment (FPI) and Foreign Direct Investment (FDI). It reveals the increase of the non-debt creating capital flows when compared to the debt creating capital. For example in 1991-92, 99.31 percentage of the total capital inflows became debt creating capital. The situation was more or less the same in 1992-93 also i.e., 97.43 percentage of the total capital inflows was debt creating capital. But gradually the situation began to change and by 2004-05 the percentage of debt creating capital to the total capital inflows was reduced to less than 50 percent i.e., 48.88 percent. Since then one can see a consistent decline in the percentage of the debt creating capital. In the year 2007-08, the percentage of non-debt creating capital in the total capital inflows has reached its zenith i.e., 66.05 percentage and in the year 2017-18 also the percentage of non-debt creating capital maintained its position and reached at 59.35 percent. Table 5.36 shows this sharp decline in the debt creating capital in the total capital inflows to India since the advent of non-debt capital by way of foreign investment. This aspect will become very vivid from the analysis of the debt service ratio[217], which is considered to be a key indicator of a country's debt burden, presented in Table 5.37.

It is true that Table 5.36 shows an increase in the total debt also in proportion to the increase of foreign investment and it may tempt one to view as the betrayal of the non-debt quality of foreign capital. But what is relevant and significant in the Table 5.37 is not the quantity of debt and non debt creating capital but the exceptional decline of debt service ratio from 30.2 in 1991 to 7.5 in 2017-18 in accordance with the increase of foreign investment. The credit of which can solely be attributed to the huge foreign investment flows to the country during the post liberalization era.

Similarly as Table 5.37 shows at present India's external debt to GDP ratio is only around 24 percent, which is quite good in comparison to the international standard. This becomes more clear when comparing to some countries like Spain, Portugal etc. whose external debt to GDP is higher than 100 percent. This is yet another positive impact of foreign investment on Indian economy. Thus for reasons galore the presence of foreign investment in the Indian economy is justified.

The above discussion reinforced the potential of foreign investment to impact host economies particularly their macroeconomic variables in the Indian context also. It played a significant role in reducing current account deficit and thus insulated or relieved the economy from the probable balance of payments problem; proved to be a major contributor of foreign exchange reserves. By enriching the foreign exchange reserves, foreign investment indirectly and at the same time positively impacted the exchange rate stability and thus strength-

[217] A country's debt service ratio measures the amount of debt interest payments to the country's export earnings. A rising debt service ratio is very often a sign of an imminent economic crisis.

Table 5.37: India's Debt Service Ratio 1991-2018

Year	**Debt Service Ratio**	**Debt Stock - GDP Ratio (%)**
1991-92	30.2	38.7
1992-93	27.5	37.5
1993-94	25.4	33.8
1994-95	25.9	30.8
1995-96	26.2	27
1996-97	23	24.6
1997-98	19.5	24.6
1998-99	18.7	23.6
1999-00	17.1	22
2000-01	16.6	22.5
2001-02	13.7	21.1
2002-03	16	20.3
2003-04	16.1	18
2004-05	5.9	18.1
2005-06	10.1	16.8
2006-07	4.7	17.5
2007-08	4.8	18
2008-09	4.4	20.3
2009-10	5.8	18.2
2010-11	4.4	18.2
2011-12	6	21.1
2012-13	5.9	22.4
2013-14	5.9	23.9
2014-15	7.6	23.9
2015-16	8.8	23.4
2016-17	8.3	20
2017-18	7.5	20.5

Source: Handbook of Statistics onIndian Economy: 2018, RBI DATABASE

ened the financial health of the economy; has produced a negative impact on Indian economy by fueling the inflation as it is found that there is a positive relation between foreign investment and inflation in India. However, since this positive relation is only a moderate one, it implies that the negative impact of foreign investment on Indian economy via inflation is not highly adverse as a moderate level of inflation is not considered as very harmful for an economy; helped to appreciate the domestic currency and thereby helped to stabilize the exchange rate in India; positively contributed to the economic growth in India as it is found that there is a positive relation between foreign investment and all the other factors which help the economic growth of India; played significant role in bringing down the debt service ratio and the ratio of external debt to GDP.

All the above findings led to the conclusion that foreign investment not only achieved the rank of a macroeconomic variable of the Indian economy but also exerted tremendous impact on the economy in that capacity both directly and indirectly either by impacting the other macroeconomic variables or in association with them. All such impacts, except those related to inflation, are indicating the positive impact of foreign investment on the Indian economy via other macroeconomic variables and as a macroeconomic variable by itself.

However it is in the capital market of the Indian economy that foreign investment made its strongly felt and strongly feared presence and impacts which actually enabled the foreign investment to make the aforesaid impacts on the macroeconomic variables of the Indian economy. Next chapter is meant for the analysis of the foreign investment on the Indian economy through the capital market.

Chapter 6

Impact of Foreign Investment in the Indian Capital Market

In the preceding chapter it is the comprehensive impact of foreign investment on the macroeconomic variables of Indian economy are analyzed by taking foreign investment as a whole i.e., both FDI and FPI. But this chapter is devoted to the analysis of the specific impact of foreign investment on the capital market[218] mainly because of three reasons. Firstly in the Indian economy, the capital market has great significance. It is the chest of the economy and whatever the impacts foreign investment or other sources make on the capital market will trickle down to the other parts of the economy in manifold ways. Secondly capital market is the major and most vibrant area of foreign investment in India occupying almost an average thirty six percent of the total foreign investment in India. And thirdly it is in the capital market that the danger zone of foreign investment - volatility - is mainly located.

The depth of foreign investment in the capital market of India is already presented in chapter 3 and especially in Table 3.13 and Figure 3.15. Here an attempt is made to examine how strong is the influence of this flow of foreign investment on the various aspects of the capital market of India like

[218]Capital market also known as stock market or equity market is that part of a financial system concerned with raising capital by dealing in shares, bonds, and other long-term investments. Foreign investment in the capital market which is also known as foreign portfolio investment, is often identified as investment by Foreign Institutional Investors (FIIs).

stock return, sectoral indices return, and areas of the development of capital market viz size of the market (market capitalization), market liquidity, P.E. Ratio, reduction of transaction costs, increase of corporate governance etc. and above all how the volatility of foreign investment influence the capital market in particular and the economy in general.

6.1 Foreign Investment and Stock Return

Foreign investment has the potential to impact the stock return (stock market return or stock prices). It is in the following way that foreign investment influences the stock return. Foreign investment helps in obtaining capital at a lower cost and provides access to cheap global credit. It thus increases money supply in the country and the increased money supply leads to an excess demand for stocks and increased demand for stocks leads to an increase in the stock prices (Friedman and Schwartz 1963)[219].

Mukherjee and Naka (1995)[220] also expressed the same view in a slightly different way. According to them, a positive money supply would positively affect economic activities, and the increase in economic activity implies increase in the cash flow among the public, which is ultimately expected to raise the demand for stocks. Due to the increase in demand for stocks, the prices of stocks are likely to go up. Other studies like that of Sohail and Hussain (2009)[221] agreed with the view that a positive money supply increases stock prices and a fall in money supply reduces the stock prices. In the light of the above arguments, the impact of foreign investment on the stock return in the Indian context is studied by taking, Stock Market Return (SMR) or Sensex Return from 1995-2018 as dependent variable and variables like Exchange Rate (NEER), Inflation (WPI), Index of Industrial Production (IIP), Interest Rate (IR) and Gold Price

[219] Friedman, M., and Schwartz, A. (1963). Money and Business Cycle. *Review of Economics and Statistics*, 45(1), 52-64.

[220] Mukherjee, T.K., and Naka, A. (1995). Dynamic Relations between Macroeconomic Variables and the Japanese Stock Market: An Application of a Vector Error Correction Model. *Journal of Financial Research*, 18(2), 223-237.

[221] Sohail, N., and Hussain, Z. (2009). Long-run and Short-run Relationship between Macroeconomic Variables and Stock Prices in Pakistan: The Case of Lahore Stock Exchange. *Pakistan Economic and Social Review*, 47(2), 183-198.

(GP) as independent variables with the help of Auto Regressive Distributed Lag (ARDL) Model.

Majority of the variables selected are macroeconomic variables and they are selected for the analysis because of the reciprocal relationship between macroeconomic variables as a whole and stock return. Capital market is highly sensitive to macroeconomic variables and it is the leading indicator of economic activity. It reflects the macroeconomic conditions and vice versa. Similarly macroeconomic variables influence capital market and predicts the stock return and current economic activities can explain stock market return as the capital market reflects macroeconomic variables.

In the same way each of the other macroeconomic variables selected for the analysis is also related to stock return. For example it is possible to see the impact of exchange rate on stock return. But the influence of exchange rate will be different in the case of exporting and importing firms. According to Fama (1981)[222], the exchange rate is a double edged weapon. A depreciation of the domestic currency improves the competitiveness of exporting companies that leads to increases in stock performance and stock return and vice versa. On the other hand an appreciation of the domestic currency will decrease the cost of imported goods, which may be beneficial for the country that has substantial trade relations with foreign market. But for exporters it will have a reverse influence. Other scholars like Kim (2003)[223] also agreed with this argument.

Similarly it is also possible to notice the impact of inflation on stock return. Inflation, which is measured through the wholesale price index influences the stock return directly through changes in the price level and indirectly through the policies designed to control it. Geske and Roll (1983)[224], Pal and Mittal (2011)[225] and Naka et al. (1998)[226] point out a significant negative relation be-

[222] Fama, E., (1981). Stock Returns, Real Activity, Inflation and Money. *American Economic Review*, 71(4) 545-565.

[223] Kim, K. (2003). Dollar Exchange Rate and Stock Price: Evidence from Multivariate Co-integration and Error Correction Model. *Review of Financial Economics*, 12(3), 301-313.

[224] Geske, R., and Roll, R. (1983). The Fiscal and Monetary Linkage between Stock Returns and Inflation. *The Journal of Finance*, 38(1), 1-33.

[225] Pal, K., and Mittal, R. (2011). Impact of Macroeconomic Indicators on Indian Capital Market. *The Journal of Risk Finance*, 12(2), 84-97.

[226] Naka, A., Mukherjee, T., and Tufte, D. (1998). *Macroeconomic Variables and the Performance of the Indian Stock Market.* Department of Economics and Finance, Working Paper No. 15, University of New Orleans.

tween inflation and stock return. A rise in the inflation rate leads to restrictive monetary policies which would increase the interest rate and thus have a negative effect on stock market activity and stock return. Moreover the inflationary tendency would decrease the purchasing power of the people. A high rate of inflation increases the cost of living and there will be shift of resources from stock market instruments to consumables. This leads to reduction in demand for market instruments, which tends to reduce the volume of trading. Another reason why inflation negatively impact stock price is that the investor shift their portfolio towards real assets if the expected inflation becomes remarkably high. Moreover high rate of inflation can cause uncertainty about future price and trigger precautionary saving. Higher precautionary saving will impact consumption and hence corporate sales growth. In short stock return are generally negatively influenced by inflation.

Another macroeconomic variable which impacts stock return is interest rate. A high interest rate will cause increase in the cost of capital (borrowing) and it will lead to increase of corporate costs and the consequent fall of profits which will lead to the fall of stock price. Several studies found that interest rate and stock price are negatively related (Gjerde and Saettem 1999)[227], (Alam and Uddin 2009)[228].

Similarly the macroeconomic variable Index of Industrial Production (IIP) which measures economic growth, affects stock prices by way of its influence on expected future cash flows. The IIP and stock prices are positively related because an increase in the IIP results in an increase in production of industrial sector and leading to an increase in the profit of industries and corporations and thereby the increase of stock price. Besides, a strong Index of Industrial Production by exhibiting the strength of the economy will lead to the increase of foreign investment in the capital market which in turn will increase stock return. Again an increase in the production of industrial sectors implies increases in the profit of the industries which implies increase of stock return (Srivastava

[227]Gjerde, O., and Saettem, F. (1999). Causal Relations among Stock Returns and Macroeconomic Variables in a Small Open Economy. *Journal of International Financial Markets Institutions and Money*, 9(1), 61-74.

[228]Alam, M.M., and Uddin, M.G.S. (2009). Relationship between Interest rate and Stock price: Empirical Evidence from Developed and Developing Countries. *International Journal of Business and Management*, 4(3), 43-51.

2010)[229], (Levin and Zervos 1996)[230].

Though not purely a macroeconomic variable but a variable which can highly influence other macroeconomic variables and stock return is the gold price. Gold price influences the stock return in the following way. When other investments are risky, people usually tend to invest in gold and when money is investing in gold, the price of gold will increase but when other investments become safe, people disinvest from gold and enter into other investments, resulting in the decline in demand for gold, thereby decreasing the price of gold. Therefore, a negative relationship exists between gold prices and stock prices. Ratnapakron and Sharma (2007)[231] found that the gold prices and the stock or bond prices are negatively correlated which means that when gold prices are rising, the stocks or bond markets are on the decline.

These expected relationship between the above variables and the stock return are presented in Table 6.1.

Table 6.1: Expected Relationship between Macroeconomic Variables and Stock Return

Dependent Variable	Independent Variables	Expected Relationship
SMR	FII	Positively related
	NEER	Positively or Negatively related
	IR	Negatively related
	WPI	Negatively related
	IIP	Positively related
	GP	Negatively related

6.1.1 Empirical Model

The model of macroeconomic determinants of Stock Market Return (SMR) in India is formulated with the above mentioned six independent variables - Foreign Institutional Investment (FII), Exchange Rate (NEER), Wholesale Price

[229] Srivastava, A. (2010). Relevance of Macro Economic Factors for the Indian Stock Market. *Decision*, 37(3), 69-89.

[230] Levine, R., and Zervos, S. (1996). Stock Market Development and Long-run Growth. *World Bank Economic Review*, 10(2), 323-339.

[231] Ratanapakorn, O., and Sharma, S.C. (2007). Dynamic Analysis between the US Stock Returns and the Macroeconomic Variables. *Applied Financial Economics*, 17(5), 369-377.

Index (WPI), Index of Industrial Production (IIP), Interest Rate (IR) and Gold Price (GP) on the basis of this the following linear equation model is developed.

$$\text{SMR}= \text{f(FII, NEER, IR, WPI, IIP, GP, } \epsilon)$$

where,
SMR = Stock Market Return
FII = Foreign Institutional Investments
$NEER$ = Nominal Effective Exchange Rate
IR = Interest Rate
WPI = Wholesale Price Index
IIP = Index of Industrial Production
GP = Gold Price
ϵ = Error Term

6.1.2 Stationarity Test

When the stationarity of the time series is checked with the help of the Augmented Dickey-Fuller Unit Root Test, it is found that Stock Market Return (SMR) or Sensex Return, Foreign Institutional Investors (FIIs) and Interest Rate (IR) are stationary at level i.e., I(0). At the same time Wholesale Price Index (WPI), Index of Industrial Production (IIP), Gold Price (GP) and Exchange Rate (NEER) are stationary at first difference i.e., I(1) as shown in Table 6.2. Since some variables are at I(0) and others at I(1). ARDL model is used to analyse the various determinants of stock return.

6.1.3 ARDL Model

The long run relationship and dynamic interaction of stock market return with macroeconomic variables, are estimated by the Auto Regressive Distributed Lag (ARDL) Model as shown in Table 6.3 and the following equation is developed on its basis.

Table 6.2: Augmented Dickey-Fuller Unit Root Test for Determinants of Stock Return

Variables	Level						I Difference						Result
	Intercept		Intercept & Trend		None		Intercept		Intercept & Trend		None		
	t-stat	p-value	t-stat	p-value	t- stat	p-value	t- stat	p-value	t- stat	p-value	t- stat	p-value	Stationarity
SMR	-12.82227	0.001	-12.80107	0.001	-12.56661	0.001	-12.34971	0.001	-12.32396	0.001	-12.37415	0.001	I(0)
FII	-10.52438	0.001	-11.18362	0.001	-5.381466	0.001	-13.25486	0.001	-13.22712	0.001	-13.28264	0.001	I(0)
NEER	-1.244568	0.6555	-3.384999	0.0556	-1.994339	0.0444	-12.90082	0.001	-12.88259	0.0	-12.72284	0.001	I(1)
WPI	0.580273	0.989	-1.963988	-1.963988	4.38	1	-9.446943	0.001	-9.497427	0.001	-8.02	0.001	I(1)
IR	-5.863164	0.001	-6.046713	0.001	-1.636045	0.0961	-14.939	0.001	-14.918	0.001	-14.963	0.001	I(0)
IIP	-0.400662	0.9057	-1.713438	0.7427	2.228	0.994	-3.954859	0.002	-3.945539	0.0117	-2.83	0.004	I(1)
GP	0.51	0.9868	-1.803	0.7007	2.3408	0.9956	14.903	0.001	-14.9747	0.001	14.592	0.001	I(1)

Source: Compiled by the Researcher

$$\begin{aligned} SMR = \alpha + \beta_1 SMR_{t-1} + \beta_2 FII_t + \beta_3 FII_{t-1} + \beta_4 FII_{t-2} + \\ \beta_5 NEER_t + \beta_6 NEER_{t-1} + \beta_7 IR_t + \beta_8 IR_{t-1} + \beta_9 IR_{t-2} + \\ \beta_{10} IR_{t-3} + \beta_{11} IR_{t-4} + \beta_{12} WPI_t + \beta_{13} WPI_{t-1} + \beta_{14} WPI_{t-2} + \\ \beta_{15} WPI_{t-3} + \beta_{16} WPI_{t-4} + \beta_{17} IIP_t + \beta_{18} GP_t + C \end{aligned} \tag{6.1}$$

Where $t-1$ is variables' lagged value by one period and $t-2$ is variables' lagged value by two period and $t-3$ is variables' lagged value by three period.

6.1.4 Optimum Lag Length Selection Criteria

Akaike Information Criterion (AIC) is used to choose the optimum lag length of the model and it shows the 20 best models with lowest AIC values. Therefore the optimal lag length is ARDL (1, 2, 1, 4, 4, 0, and 0) as shown in Figure 6.1.

6.1.5 ARDL Bound Test Approach for Co-integration

ARDL Bound Test is used to investigate the co-integration or long run relationship between macroeconomic variables and stock return. It can be seen from the Table 6.4 that computed F-statistic value is 25 which is more than the upper bound critical value at 5 percent level. It indicates that there is a long run relationship or co-integration between variables of this model. i.e., a long-run co-integration or relationship between stock market return and variables like

Table 6.3: ARDL Model for Determinants of Stock Market Return

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
SMR(-1)	0.201924	0.060817	3.320207	0.001
FII	0.032152	0.005229	6.149051	0.001
FII(-1)	0.004222	0.005689	0.742097	0.4588
FII(-2)	-0.012232	0.005068	-2.413515	0.0165
NEER	0.522024	0.222325	2.348026	0.0197
NEER(-1)	-0.568133	0.221766	-2.561861	0.011
IR	-0.101583	0.135449	-0.749973	0.454
IR(-1)	-0.013365	0.139234	-0.095987	0.9236
IR(-2)	-0.115902	0.136251	-0.850654	0.3958
IR(-3)	0.361646	0.135147	2.675937	0.008
IR(-4)	-0.259441	0.12718	-2.039956	0.0424
WPI	-0.980165	0.571065	-1.71638	0.0874
WPI(-1)	0.025329	0.597166	0.042415	0.9662
WPI(-2)	-0.598829	0.58985	-1.015223	0.311
WPI(-3)	1.63097	0.590135	2.763723	0.0062
WPI(-4)	-1.547871	0.56155	-2.756427	0.0063
IIP	-0.017445	0.021791	-0.800592	0.4242
GP	-7.33E-005	0.000109	-0.669904	0.5036
C	9.236356	6.547078	1.41076	0.1596
R-squared	0.33965	**Mean dependent var**		1.018919
Adjusted R-squared	0.290124	**S.D. dependent var**		6.127300
S.E. of regression	5.162504	**Akaike info criterion**		6.191250
Sum squared resid	6396.348	**Schwarz criterion**		6.452175
Log likelihood	-782.7668	**Hannan-Quinn criter.**		6.296157
F-statistic	6.857982	**Durbin-Watson stat**		2.040443
Prob(F-statistic)	0.001			
Dependant Variable: SMR				

**Note: p-values and any subsequent tests do not account for model selection.*

economic growth, inflation, exchange rate, interest rate, foreign institutional investment and gold price.

The long run coefficient results illustrated in Table 6.5 indicates that the coefficients of Foreign Institution Investors (FIIs) are statistically significant and have a positive impact on the capital market in India. Likewise, the Wholesale Price Index (WPI) is found as another extremely important variable to the stock market performance and its impact is found adverse. On the other side, it

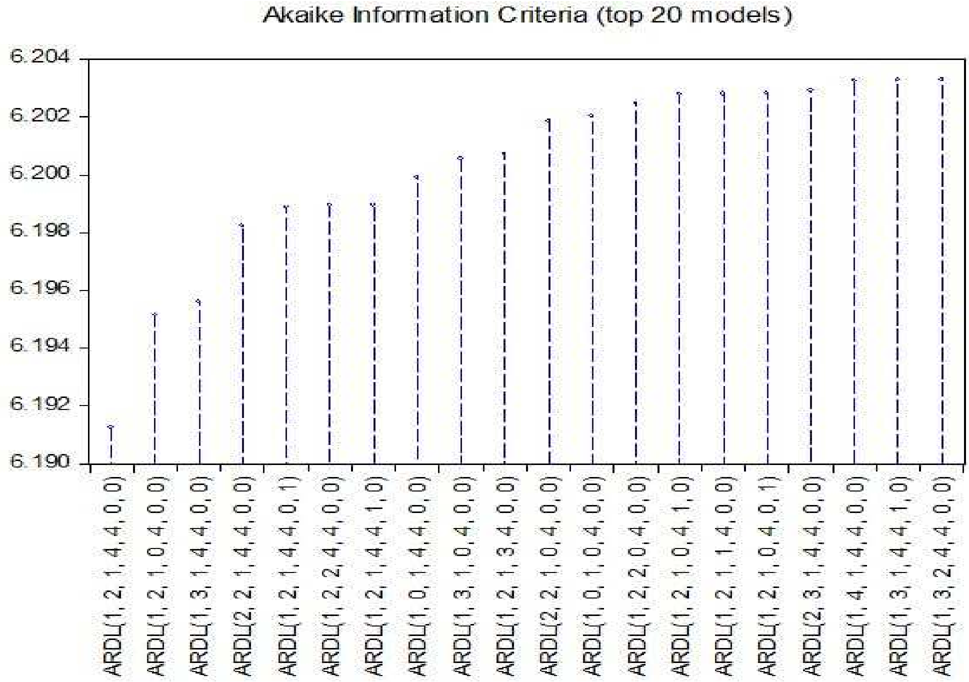

Figure 6.1: Akaike Information Criterion (AIC)

is found that the impact of Exchange Rate (NEER), Interest Rate (IR), Index of Industrial Production (IIP) and Gold Price (GP) are statistically insignificant for the performance of Stock Market Return (SMR) in India. This finding agrees with the finding of Ibrahim (2003)[232], Chaudhuri and Smiles (2004)[233], and Buyuksalvarci (2010)[234].

6.1.6 Short Run Coefficient and Error Correction Term

The Short Run Coefficient and Error Correction Term (ECT) of the macroeconomic variables on Stock Market Return (SMR) are presented in Table 6.5. It shows that the short run coefficient of Inflation (WPI), Exchange Rate (NEER), Interest Rate (IR) and Foreign Institutional Investment (FII) are statistically significant but the coefficient of Economic Growth (IIP) and Gold Price (GP) are seen statistically insignificant. Similarly the Coefficient of Error Correc-

[232] Ibrahim, H., and Aziz, H. (2003). Macroeconomic Variables and the Malaysian Equity Market: A View Through Rolling Subsamples. *Journal of Economic Studies*, 30(1), 6-27.

[233] Chaudhuri, K., and Smiles, S. (2004). Stock Market and Aggregate Economic Activity: Evidence from Australia. *Applied Financial Economics*, 14(2), 121-129.

[234] Buyuksalvarci, A. (2010). The Effects of Macroeconomic Variables on Stock Returns: Evidence from Turkey. *European Journal of Social Sciences*, 14(3), 404-416.

Table 6.4: ARDL Bound Test for Determinants of Stock Return

Test Statistic	**Value**		**k**	
F-statistic	25.02986		6	
Critical Value Bounds:				
Significance	**I(0) Bound**		**I(1) Bound**	
10%	2.12		3.23	
5%	2.45		3.61	
2.50%	2.75		3.99	
1%	3.15		4.43	
Null Hypothesis: No long-run relationships exist				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(FII)	0.031728	0.005239	6.055796	0.001
D(FII(-1))	0.012251	0.005076	2.413465	0.0166
D(NEER)	0.535477	0.221126	2.421586	0.0162
D(IR)	-0.104658	0.136009	-0.769493	0.4424
D(IR(-1))	0.013124	0.158944	0.082568	0.9343
D(IR(-2))	-0.106801	0.147155	-0.725773	0.4687
D(IR(-3))	0.258668	0.127627	2.026746	0.0438
D(WPI)	-0.95031	0.578539	-1.642604	0.1018
D(WPI(-1))	0.551666	0.716093	0.770384	0.4418
D(WPI(-2))	-0.095869	0.636132	-0.150706	0.8803
D(WPI(-3))	1.574406	0.560552	2.808671	0.0054
C	9.094066	6.633704	1.370888	0.1717
FII(-1)	0.024046	0.007397	3.250826	0.0013
NEER(-1)	-0.045208	0.052321	-0.864051	0.3884
IR(-1)	-0.127341	0.143663	-0.88639	0.3763
WPI(-1)	-1.448329	0.865781	-1.672859	0.0957
IIP(-1)	-0.017448	0.022051	-0.791244	0.4296
GP(-1)	-7.12E-005	0.000111	-0.64312	0.5208
SMR(-1)	-0.799092	0.060981	-13.1039	0.001
R-squared	0.572644	**Mean dependent var**		0.018571
Adjusted R-squared	0.540593	**S.D. dependent var**		7.618765
S.E. of regression	5.163969	**Akaike info criterion**		6.191817
Sum squared resid	6399.977	**Schwarz criterion**		6.452742
Log likelihood	-782.8403	**Hannan-Quinn criter.**		6.296724
F-statistic	17.86627	**Durbin-Watson stat**		2.039316
Prob(F-statistic)	0.001			
Dependent Variable: D(SMR)				

Source: Compiled by the Researcher

Table 6.5: Estimated Co-Integrating Term and Long-Run Coefficients Using ARDL Approach for Determinants of Stock Return

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FII)	0.032152	0.005229	6.149051	0.000
D(FII(-1))	0.012232	0.005068	2.413515	0.0165
D(NEER)	0.522024	0.222325	2.348026	0.0197
D(IR)	-0.101583	0.135449	-0.749973	0.454
D(IR(-1))	0.115902	0.136251	0.850654	0.3958
D(IR(-2))	-0.361646	0.135147	-2.675937	0.008
D(IR(-3))	0.259441	0.12718	2.039956	0.0424
D(WPI)	-0.980165	0.571065	-1.71638	0.0874
D(WPI(-1))	0.598829	0.58985	1.015223	0.311
D(WPI(-2))	-1.63097	0.590135	-2.763723	0.0062
D(WPI(-3))	1.547871	0.56155	2.756427	0.0063
D(IIP)	-0.017445	0.021791	-0.800592	0.4242
D(GP)	-0.000073	0.000109	-0.669904	0.5036
CointEq(-1)	-0.798076	0.060817	-13.122659	0.000***
Cointeq = SRM - (0.0303*FIIs - 0.0578*NEER - 0.1612*IR - 1.8426*WPI - 0.0219 *IIP -0.0001*GP + 11.5733)				
Long Run Coefficients				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
FII	0.030251	0.008696	3.478542	0.0006***
NEER	-0.057776	0.064499	-0.895762	0.3713
IR	-0.161194	0.178773	-0.901671	0.3681
WPI	-1.84264	1.087481	-1.694411	0.0915*
IIP	-0.021859	0.027256	-0.802007	0.4233
GP	-0.000092	0.000137	-0.671491	0.5026
C	11.573277	8.157512	1.418726	0.1573
Dependant Variable: SRM				

* Significant at 10% ***Significant at 1%

tion Term of the model is also found significant and negative. The estimated equilibrium of Error Correction Term is -0.7980 with proper sign (negative) and highly significant at 1%. The high absolute value of coefficient of Error Correction Term indicates the very high speed of adjustment to equilibrium following short run shock, the 0.79% of the disequilibrium caused by the previous months' shock converges back to long-run equilibrium in the current month. It is an evidence of co-integration (long-run relationship) among all the variables in the model.

This relationship between foreign investment and stock return is also reflected in the relation between foreign investment (FIIs) and the return of the two indices of the Indian capital market[235] i.e., Sensex and Nifty.

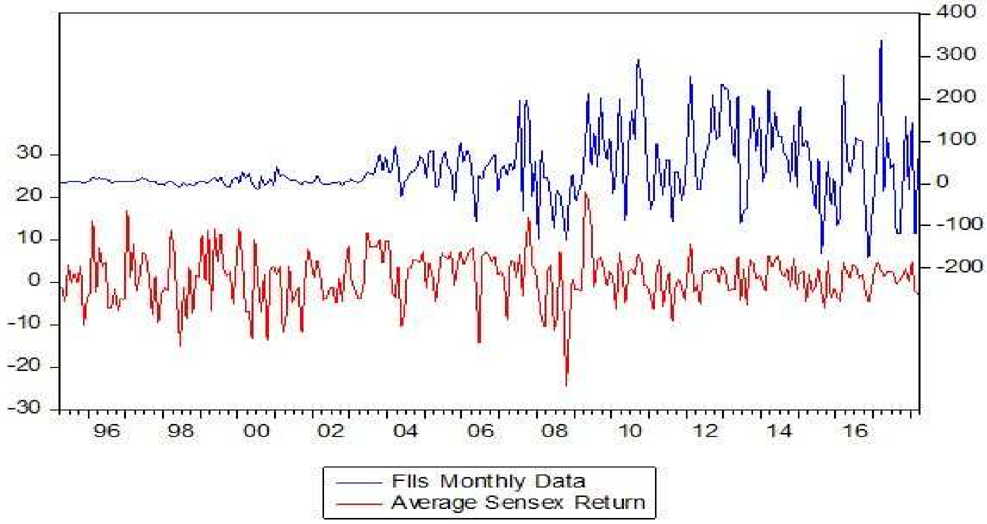

Figure 6.2: Foreign Institutional Investment and BSE Sensex Return

The relationship between foreign institutional investment and the Sensex Return is demonstrated in Figure 6.2. It shows the increase of the Sensex return in accordance with the increase of foreign institutional investment implying the positive correlation between foreign investment and Sensex Return in India (Appendix D.1). Same relation exist between FIIs investment and Nifty Return also as can be seen in Figure 6.3. It shows the increase of Nifty Return in accordance with the increase of foreign institutional investment implying the positive correlation between foreign institutional investment and Nifty Return (Appendix D.2).

[235]Most of the share trading in the Indian equity market takes place through two stock exchanges i.e., Bombay Stock Exchange of India (BSE) and National Stock Exchange of India (NSE). The index of the former is known as Sensex and the index of the later as Nifty.

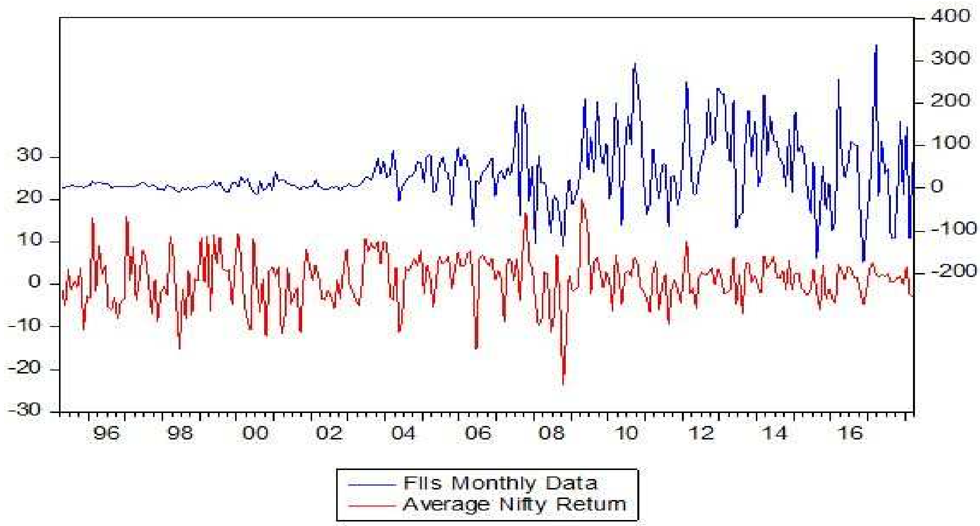

Figure 6.3: Foreign Institutional Investment and NSE Nifty Return

6.2 Impact of Foreign Investment on the Different Sectors of the Indian Capital Market

The impact of foreign investment on the capital market is further illustrated by analyzing its impact on the different sectors of her capital market. In order to equip the investors with more comprehensive and reliable information, the BSE has launched various sectorial indices[236], which contemplate the functioning of that particular sector. To construct indices, the scrips of the companies working in the particular sector will be chosen on the basis of several elements like trading frequency, market capitalization etc. As these indices give a picture of each sector, it is decided to analyze the sectorial indices by taking the 20 sector indices listed on Bombay Stock Exchange and monthly data for these indices for the study period (2007-2018) which has been obtained from the official website of Bombay Stock Exchange.

Table 6.6 reveals the bullish and bearish sectors of the Indian capital market i.e., it reveals which sector is likely to give the best or maximum return and which sector gives the minimum return. Accordingly the highest mean return is described by the Bank Index (1.5 per month) followed by FMCG and Finance while the minimum mean return is reported by Telecom and Reality sectors

[236]The Market Sector Indices summarize the performance of stocks grouped by specific market sectors. Sectoral indices of the Indian capital market are given in Appendix D.3.

(0.05 per month). Similarly Reality sector is found as the most volatile, most complex and most dynamic sector while FMCG and Health sectors are the least volatile during the entire period.

Table 6.6: Descriptive Statistics of Sectoral Indices

Variables	Mean	Median	Maximum	Minimum	Std. Devi	Skewness	Kurtosis	J B Coefficient	P - Value
Bank	1.54	0.92	45.26	-23.69	9.91	0.67	5.8	48.15	0.0
Basic Materials	1.18	0.57	42.27	-35.88	10.02	0.12	5.84	40.32	0.0
Capital Good	0.97	-0.37	50.73	-33.67	10.66	0.85	7.13	99.46	0.0
CDGS	1.09	1.3	42.49	-29.87	8.48	0.3	8.16	133.98	0.0
Consumer Durable	1.68	1.6	56.92	-29.23	10.29	0.772	9.98	253.56	0.0
Energy	0.84	1.16	28.91	-31.76	8.02	-0.067	5.62	34.12	0.0
Finance	1.48	1.11	44.4	-23.63	9.46	0.6	6.21	58.69	0.0
FMCG	1.49	1.23	21.01	-16.7	5.09	-0.125	5.15	23.38	0.0
Health Care	1.40	2.29	15.58	-24.33	5.92	-1.01	5.98	64.28	0.0
Industrials	1.02	1.15	52.18	-35.13	10.2	0.79	8.47	161.5	0.0
IT	0.89	0.91	20.53	-21.97	7.52	-0.1	3.55	1.75	0.415
Metal	0.87	-0.74	57.98	-40.3	11.98	0.64	7.23	97.24	0.0
Oil & Gas	0.89	1.02	28.11	-31.45	7.98	-0.12	5.4	29.03	0.0
Power	0.45	0.39	36.37	-29.94	9.25	0.61	6.23	59.25	0.0
PSU	0.62	0.22	43.72	-26.91	8.72	0.82	7.98	136.36	0.0
Reality	0.05	-1.76	79.3	-43.67	15.91	1.11	7.71	134.97	0.0
Auto	1.55	1.9	31.79	-26.92	7.95	0.02	5.44	29.55	0.0
Teck	0.58	0.81	17.11	-18.28	6.56	-0.17	3.74	3.38	0.183
Telecom	0.07	0.28	22.1	-31.38	8.75	-0.36	4.01	7.64	0.021
Utilities	0.76	-0.19	33.82	-28.64	9.19	0.45	5.33	31.19	0.0

Source: Compiled by the Researcher

6.2.1 Foreign Investment and Sectoral Indices Performance

There is a close relationship between foreign institutional investors and the performance of the different sectors of the Indian capital market. The empirical analysis clearly shows that there exist a direct relationship between FIIs and stock market indices indicating that FIIs and the return from different sectors of the capital market will move in the same direction. It implies that the FIIs have a substantial impact on the performance of the stock market indices and the existense of a direct relationship between them.

As per the Regression Analysis shown in Table 6.7 all sector specific indices have pointed toward significant relationship with Foreign Institutional Investors at varying degree. It is found that Banking Sector has the highest R-square value, where the FIIs are more focused. It is also learnt that they are least concentrated on the Information Technology Sector.

Table 6.7: Regression Analysis of FIIs Impact on Sectoral Indices Performance

Indices	R-Square	Coefficient	Std.Error	t-Static	Sig.	BPG Test	DW Test	BG Serial Correlation
Bank	0.330061	0.000582	7.66E-005	7.592281	0.0	0.1446	1.755397	0.1446
Basic Materials	0.317075	0.000576	7.82E-005	7.370342	0.0	0.9271	1.487367	0.0055
Capital Good	0.290295	0.000587	8.49E-005	6.917885	0.0	0.2372	1.572645	0.0698
CDGS	0.32381	0.000493	6.59E-005	7.485211	0.0	0.9168	1.641576	0.1312
Consumer Durable	0.243114	0.000518	8.45E-005	6.130312	0.0	0.9743	1.698504	0.2567
Energy	0.241464	0.000403	6.60E-005	6.102831	0.0	0.4683	1.685989	0.1735
Finance	0.332376	0.000557	7.30E-005	7.632055	0.0	0.4735	1.650147	0.0813
FMCG	0.160443	0.000208	4.41E-005	4.728556	0.0	0.2925	2.16598	0.1149
Health Care	0.189286	0.000263	5.04E-005	5.226591	0.0	0.134	2.1486	0.5451
Industrials	0.32148	0.000591	7.94E-005	7.445404	0.0	0.33	1.489637	0.0231
IT	0.119055	0.000265	6.67E-005	3.97643	0.0	0.4015	1.869415	0.5057
Metal	0.242585	0.000603	9.85E-005	6.121501	0.0	0.6886	1.570148	0.0023
Oil & Gas	0.23952	0.000399	6.57E-005	6.070436	0.0	0.3971	1.719815	0.1969
Power	0.266728	0.000488	7.48E-005	6.523719	0.0	0.4702	1.578462	0.072
PSU	0.266863	0.00046	7.05E-005	6.525969	0.0	0.4758	1.842882	0.5801
Reality	0.268517	0.000842	0.000129	6.553556	0.0	0.4561	1.793375	0.5297
Auto	0.31065	0.000453	6.23E-005	7.261211	0.0	0.838	1.751254	0.1618
Teck	0.223124	0.000317	5.47E-005	5.79683	0.0	0.4811	1.804246	0.5641
Telecom	0.232037	0.00043	7.24E-005	5.945679	0.0	0.9134	2.177008	0.618
Utilities	0.220705	0.000441	7.66E-005	5.756358	0.0	0.7506	1.58634	0.0765

Source: Compiled by the Researcher

6.3 Impact of Foreign Investment in the Development of the Indian Capital Market

A developed capital market is one which has high liquidity, huge volume of business (market capitalization), high Price Earnings Ratio, large number of listed companies, minimum transaction costs, good corporate governance etc.

(Pagano 1993)[237], (Demirguc-Kunt and Levine 1996)[238], (Levine and Zervos 1998)[239] and (Beck et al. 1999)[240]. As per this criteria it can be seen that Indian capital market is a developed capital market. The following analysis substantiates the role of foreign investment in this development.

6.3.1 Liquidity of the Indian Capital Market

Liquidity[241], the easiness to convert stock to cash, is an important indicator of stock market development because only in a developed capital market that stocks can be rapidly sold and converted into cash with little impact on the stock price. It is found that there is a positive correlation between FIIs investment and turnover of the Indian capital market (Appendix D.4). It is seen that when foriegn institutional investment increases turnover of the Indian capital market also increases and vice versa. Figure 6.4 also demonstrates that foriegn institutional investment are able to create an upward movement in Indian stock market liquidity.

The impact of FIIs on the liquidity of the Indian capital market is tested with the help of Granger Causality Test taking stock market turnover as the dependent variable and foriegn institutional investment flows as the independent variable.

6.3.1.1 Empirical Model

A linear equation model is formulated on the basis of the relationship between stock market turnover and FII flows in the following way.

$$TO = f(FII)$$

[237] Pagano, M. (1993). Financial Markets and Growth: An Overview. *European Economic Review*, 37(2), 613-622.

[238] Demirgue-Kunt, Asli and Ross Levine (1996). Stock Market Development and Financial Intermediation; Stylized Facts. *The World Bank Economic Review*, 10(2), 291-321.

[239] Levine, R., and Zervos, S. (1998). Stock Markets, Banks and Economic Growth. *The American Economic Review*, 88(3), 537-558.

[240] Beck, T., Demirguc-Kunt, A., and Levine, R. (1999). *A New Database on Financial Development and Structure*. World Bank Working Paper No. 2146, World Bank.

[241] Liquidity of the capital market is usually measured in terms of the turnover of the capital market.

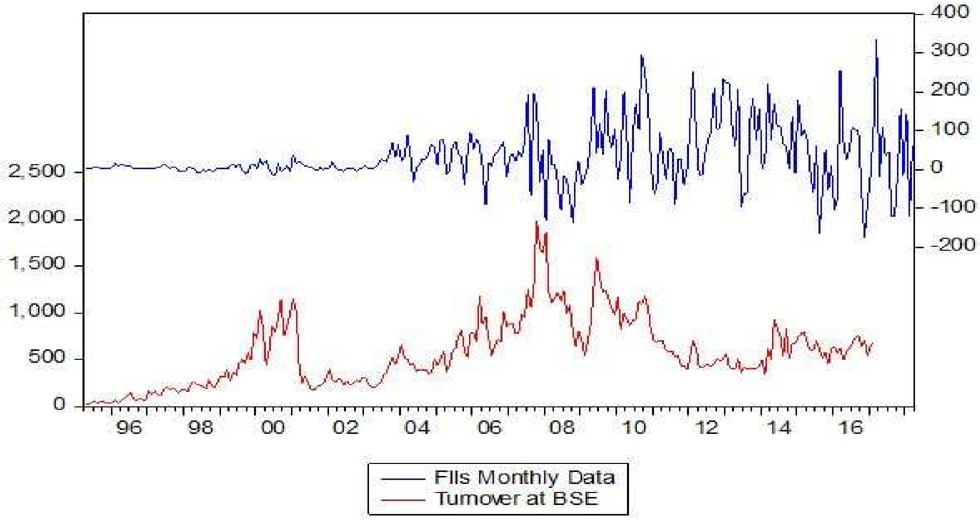

Figure 6.4: Relationship between FIIs Investment and Market Liquidity

where,
TO = Stock Market Turnover
FII = Foreign Institutional Investment

6.3.1.2 Optimum Lag Length Selection Criteria

In this empirical test the optimal lag is selected on the basis of the minimum value of AIC, according to which the lower the value of AIC, better the model. It is found that, as can be seen in the Table 6.8 the optimum lag length of the model is 2.

6.3.1.3 Granger Causality Test

As per the Granger Causality Test, as shown in Table 6.9, foreign institutional investment have significant positive impact on market liquidity. (At the same time it is found that market liquidity have no significant impact on the flows of foreign institutional investment to the Indian capital market.)

Table 6.8: Lag Order Selection Criteria of the Liquidity of the Indian Capital Market

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-3305.442	NA	6.32e+08	25.94072	25.96850	25.95190
1	-3049.905	505.0616	87936954	23.96788	24.05121*	24.00140
2	-3040.408	18.62117	84227029*	23.92477*	24.06364	23.98063*
3	-3038.201	4.292404	85421505	23.93883	24.13326	24.01704
4	-3036.837	2.632145	87208494	23.95951	24.20948	24.06006
5	-3030.515	12.09903*	85638638	23.94129	24.24681	24.06419
6	-3028.07	4.640162	86695734	23.95349	24.31456	24.09873
7	-3025.221	5.364187	87489734	23.96251	24.37913	24.13010
8	-3024.121	2.052086	89514083	23.98526	24.45743	24.17519

** indicates lag order selected by the criterion*

LR: Sequential Modified LR Test Statistic (each test at 5% level)

FPE: Final Prediction Error

AIC: Akaike Information Criterion

SC: Schwarz Information Criterion

HQ: Hannan- Quinn Information Criterion

Table 6.9: FIIs Investment and Liquidity of the Capital Market - Granger Causality Test

Null Hypothesis:	F-Statistic	Prob.
FIIs does not Granger Cause Turnover (BSE)	5.90457	0.0031***
Turnover (BSE) does not Granger Cause FIIs	1.35623	0.2595

*** Significant at 1%

6.3.2 Foreign Investment and Market Capitalization

Market capitalization[242] i.e., size of the market is another parameter or component of stock market development. The Figure 6.5 depicts the basic trend and progress of market capitalization and foreign investment in the Indian capital market. It shows that there is a positive relationship between the two as the increase in FII was followed by market capitalization (Appendix D.5).

[242] Market capitalization is the aggregate valuation of the company based on its current share price and the total number of outstanding stocks. It is calculated by multiplying the current market price of the company's share with the total outstanding shares of the company.

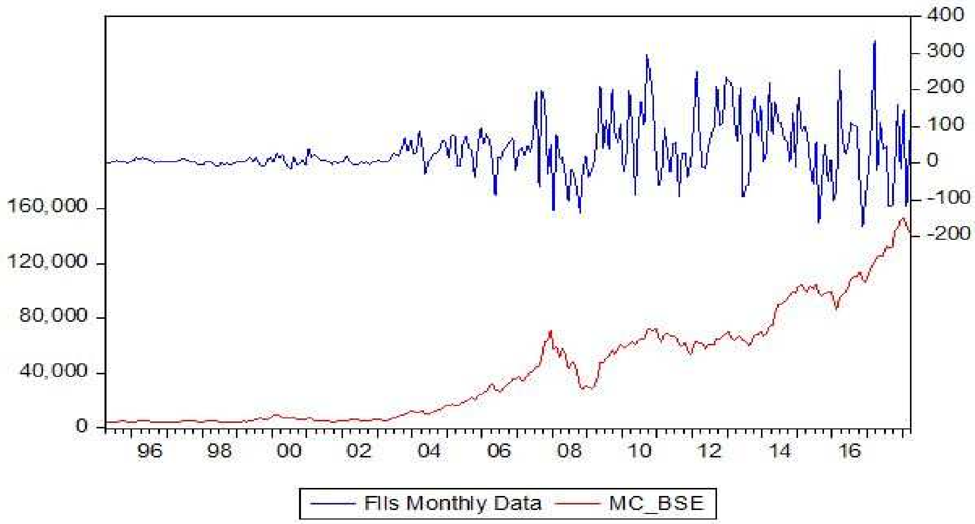

Figure 6.5: Relationship between FII and Market Capitalization

6.3.2.1 Impact of Foreign Investment on the Different Types of Companies in India

On the basis of the market capitalization Indian companies are classified into three - large cap companies [243], mid cap companies[244] and small cap companies[245]. As noted in the Table 6.10 the highest mean return is seen in the large cap companies followed by mid cap companies and the minimum mean return is reported by small cap companies. That is during the period under study the large cap companies showed the highest return (average return) i.e., 1.25 percent per month and small cap companies showed the lowest return i.e., 1.05 percent per month. Similarly the volatility in terms of standard deviation is also found highest in small cap companies whereas large cap companies showed the least volatility during the entire period.

Table 6.11 shows that all the three types of companies in India have signifi-

[243]Large Cap Companies are big and well-established companies. Most of the large cap companies are leaders in their sector and have a huge market presence. Majority of the large cap companies are listed in Sensex 30 and Nifty 50. Since these companies have very large capitalization they can survive in adverse economic conditions.

[244]Mid Cap Companies represent mid-sized companies that are relatively more risky than large cap as investment options, yet they are not considered as risky as small cap companies. These companies have a potential to become a large cap in few years and have enough finance to survive harsh economic conditions.

[245]Small Cap Companies have small market capitalization and usually include the start-ups or companies in the early stage of development. Small cap stocks are potentially big gainers as they are yet to be discovered within the sector. However, the risk level is high while investing in small cap companies.

Table 6.10: Descriptive Statistics of Companies Based on Market Capitalization

Variables	Mean	Median	Maximum	Minimum	Std. Devi	Skewness	Kurtosis	J B Coefficient	P - Value
large cap	1.25	0.73	29.11	-25.18	6.8	0.04	6.19	50.6	0.0
mid cap	1.12	2.48	43.9	-33.3	8.6	0.2	8.85	170.9	0.0
small cap	1.05	2.04	51.91	-32.49	9.9	0.7	8.92	183.65	0.0

Source: Compiled by the Researcher

Table 6.11: Regression Analysis of the Impact of FII on Large Cap, Mid Cap and Small Cap Companies

Indices	R-Square	Coefficient	Std.Error	t-Static	Sig.	BPG Test	DW Test	BG Serial Correlation
large cap	0.371	4.00E-004	5.16E-005	8.311274	0.0	0.9459	1.676788	0.2104
mid cap	0.334	5.00E-004	6.68E-005	7.65394	0.0	0.9319	1.46458	0.0141
small cap	0.273	5.00E-004	7.98E-005	6.62281	0.0	0.8939	1.504396	0.0249

Source: Compiled by the Researcher

cant relationship with foreign institutional investment but with varying grade. As the highest R-square value is found in large cap companies and the lowest R-square value in small cap companies, it follows that FIIs are more focused on the large cap and least concentrated on the small cap companies.

6.3.3 Price Earnings Ratio (P.E. Ratio)

The P.E. Ratio[246] the tool used to estimate the fair value of the capital market and the most widely used financial ratio analysis for long term investment, is also found impacted by foreign institutional investment and there is a positive relationship between foreign institutional investment and P.E. Ratio of the Indian capital market (Appendix D.6).

The Figure 6.6 illustrates that an increase in the foreign institutional investment leads to an increase of P.E. Ratio. This relationship between foreign investment and P.E. Ratio is tested with the help of the Granger Causality Test and it further substantiates the impact of foreign institutional investment on P.E. Ratio.

[246]P.E. Ratio is used to evaluate how expensive or cheap, the stock market/stock may be at any given time. Price to Earnings Ratio = (Price per Share) / (Earnings per Share).

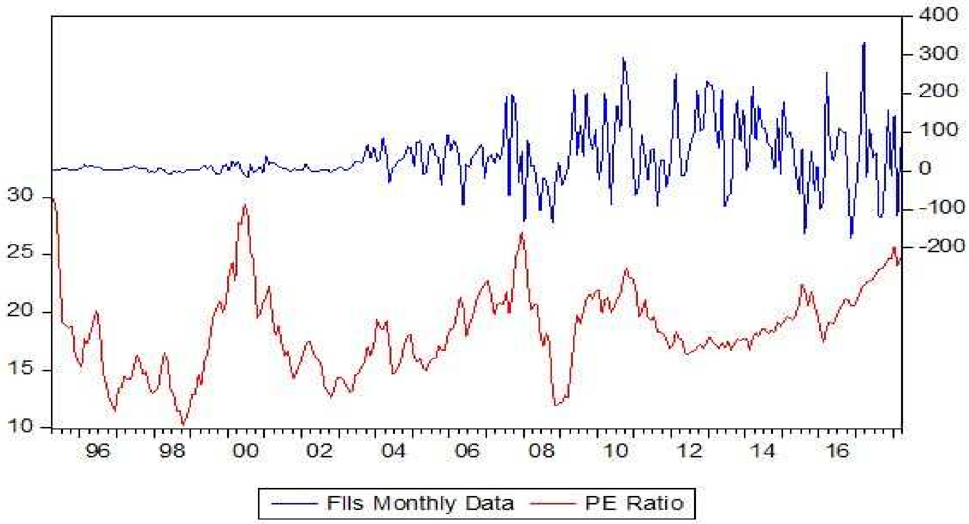

Figure 6.6: Relationship between FIIs and P.E. Ratio

6.3.3.1 Empirical Model

The Granger Causality Test is conducted on the basis of the following linear equation.

$$P.E.Ratio = f(FII)$$

where,
P.E. Ratio = Price Earnings Ratio
FII = Foreign Institutional Investment

6.3.3.2 Optimum Lag Length Selection Criteria

As per the AIC criterion since the lower the value of AIC, better the model, the optimum lag length value is found as 2 as seen in Table 6.12.

6.3.3.3 Granger Causality Test

The result of the Granger Causality Test is given in Table 6.13 and it shows that the foreign institutional investment have significant positive impact on the Price Earnings. (Though the Price Earnings of the Sensex thirty companies

Table 6.12: Lag Order Selection Criteria of Foreign Investment and P.E. Ratio

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-2125.337	NA	60429.96	16.68499	16.71277	16.69617
1	-1818.765	605.9309	5631.477	14.31188	14.39520	14.34540
2	-1805.78	25.45946*	5248.353*	14.24141*	14.38029*	14.29727*
3	-1803.466	4.502031	5318.286	14.25463	14.44906	14.33284
4	-1802.407	2.042312	5442.577	14.27770	14.52767	14.37825
5	-1797.781	8.853489	5416.170	14.27279	14.57831	14.39568
6	-1797.049	1.388733	5557.191	14.29843	14.65950	14.44366
7	-1796.281	1.446019	5700.393	14.32377	14.74039	14.49135
8	-1794.337	3.628570	5793.785	14.33990	14.81207	14.52983

** indicates lag order selected by the criterion*

LR: Sequential Modified LR Test Statistic (each test at 5% level)

FPE: Final Prediction Error

AIC: Akaike Information Criterion

SC: Schwarz Information Criterion

HQ: Hannan- Quinn Information Criterion

are not the major attraction for the FIIs to choose India as their investment destination.)

Table 6.13: FIIs Investment and P.E. Ratio of the Capital Market - Granger Causality Test

Null Hypothesis:	F-Statistic	Prob.
FIIs does not Granger Cause P.E. Ratio	3.07756	0.0478**
P.E. Ratio does not Granger Cause FIIs	2.31252	0.1011

** Significant at 5%

6.3.4 Foreign Investment and Reduction of Transaction Costs

Transaction costs, the costs which incur during the buying or selling of stocks, is the indicator of the efficiency and development of a capital market. After the liberalization, foreign investments have drastically reduced the transaction costs in the Indian capital market. Now, transaction costs in the Indian capital market are almost at par with the best in the world. This reduction of the transaction costs occured after the entry of the foreign investment in the capital market as illustrated in Table 6.14.

Table 6.14: Foreign Investment and Reduction of Transaction Costs

Transaction Cost Trading (%)	**1994**	**2018**	**Global Best**
Fees	2.5	0.25	0.25
Impact Cost Clearing	0.75	0.25	0.2
Counter Party Risk Settlement (%)	Present	Nil	Nil
Paper Work	0.75	0.1	0
Bad Delivery	0.5	0	0
Stamp Duty	0.25	0	0
Total (%)	>4.75	0.6	0.45

Source: Compiled from Indian Securities Markert Review, 2018

When the transaction costs such as trading fee, bad delivery, counterparty risk, impact cost and stamp duty etc. in the Indian capital market are taken together, it can be seen that there has been a drastic reduction - from around 4.75 percent in 1994 to 0.6 percent in 2018. This is a reflection of substantial improvement in the market efficiency and in this field foreign investment has made significant contribution.

6.3.5 Foreign Investment and Other Developments of the Indian Capital Market

Besides, some qualitative developments in the Indian capital market like improvement in the transparency of business, knowledge flows, management efficiency, modernization etc, though cannot be quantitatively analyzed, can also be attributed to the foreign investment as these developments have taken place after the arrival of foreign investment in the capital market. Similarly other recent developments in the Indian capital market like increase in the number of the listed companies, improvement in the corporate governance, online trading etc. can also be attributed to the advent of the foreign investment in the capital market. For example in 1992 there were only 100 listed companies but this number began to increase in proportion to the foreign investment. And this is a clear indication of the development of the capital market, occurred since the foreign investment flows. It is also possible to argue that the advent of the foreign investors with their expertise, presence of fund managers etc. necessitated the improvement of corporate governance in India to a very great extent.

6.4 Foreign Investment and the Volatility of the Capital Market of India

Foreign investment brings to the host economies a friend and a foe - non debt capital and volatility respectively. Both impact the economy, the former positively and the latter negatively. Foreign investment which has been used as a synonym for capital inflows is not a uni-dimensional capital flows confined to mere capital inflows only. It has a dangerous aspect too i.e., capital outflows, perhaps more dangerous, risky, and liability creating than short term loans. Capital outflows, after impacting directly the capital market transmit and spread this impact to the whole economy. It is this aspect of the foreign investment in the capital market which mainly makes it controversial, unattractive and disadvantageous to the host economies. Therefore the role of the foreign investment in the Indian economy can be assessed and evaluated properly only if this aspect of capital flows that is capital outflows too will be analyzed. Hence this aspect is examined by

a. Analysing the general trend of the foreign investment flows (inflows and outflows) from the Indian economy during the period under study

b. Analysing the flow of foreign investment to and from Indian capital market during the days of Indian economy's stress and strain and

c. Testing the volatility of foreign investment flows statistically.

6.4.1 Analysis of the General Trend of Foreign Investment Inflows and Outflows in Indian during the Period 1992 to 2018

As mentioned above volatility of foreign investment not only affects capital market but also the whole economy and Indian economy too is not free from the phenomena of the volatility of foreign investment. Table 6.15 which shows the inflows and outflows of foreign investment during the period of the study indicates that during the last two decades for every capital inflows there was a significant and opposite flows of capital that is capital outflows declaring that foreign investment in Indian capital market too is not free from volatility.

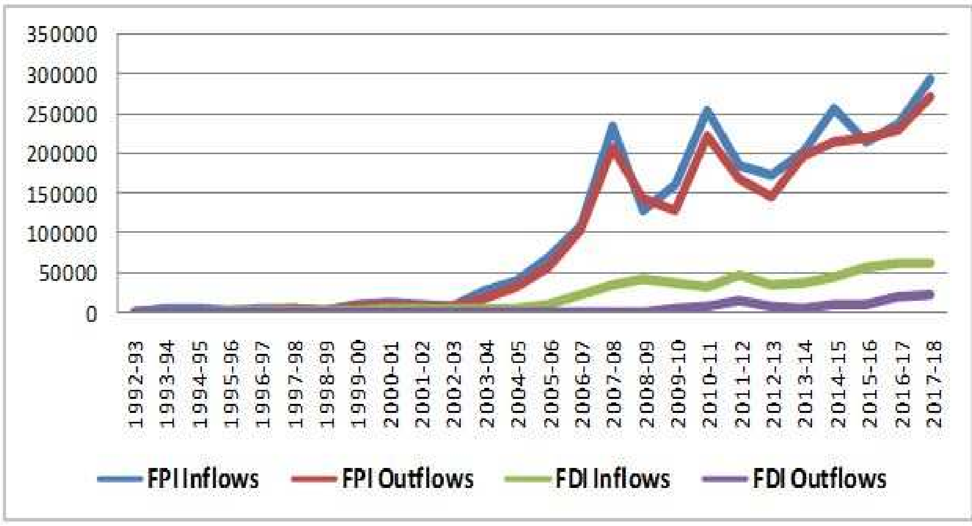

Figure 6.7: Comparison between Foreign Investment Inflows and Outflows

The Figure 6.7 demonstrates that when compared to FPI there is less foreign investment outflows in the case of FDI. But this is not the case of the outflow of foreign investment from the capital market and inflows and outflows of foreign investment from the capital market are highly correlated and the correlation between these two is 0.99. So in India also FPI is more volatile than FDI.

Table 6.15: Comparison between Foreign Investment Inflows and Outflows

Year	FPI Inflows (US $ Million)	FPI Outflows (US $ Million)	FDI Inflows (US $ Million)	FDI Outflows (US $ Million)
1992-93	244	0	345	30
1993-94	3958	391	651	65
1994-95	4402	578	1351	8
1995-96	3456	708	2174	30
1996-97	4953	1641	2864	22
1997-98	5573	3745	3596	34
1998-99	3225	3286	2518	38
1999-00	9951	6925	2170	3
2000-01	13619	10859	4031	0
2001-02	9259	7238	6130	5
2002-03	8833	7854	5095	59
2003-04	28218	16841	4322	0
2004-05	40847	31532	6052	65
2005-06	68120	55628	8962	61
2006-07	109534	102531	22826	87
2007-08	233564	206293	34844	116
2008-09	128511	142366	41903	166
2009-10	159897	127521	37746	4637
2010-11	253175	221704	32902	7018
2011-12	184747	167338	46552	13599
2012-13	173762	145992	34298	7345
2013-14	202332	197304	36047	5284
2014-15	256048	213854	45147	9864
2015-16	215707	219349	55559	10652
2016-17	237514	229748	60220	18005
2017-18	293529	271364	60974	21544

Source: RBI Database

6.4.2 Foreign Investment Flows during the Days of Indian Economy's Stress and Strain

The performance of the flows of the foreign investment cannot be assessed correctly simply by assessing their performances during normal times. On the contrary it is only by assessing their performance during the times of crises that one can identify their role in the economy and know whether they are friends or foes to the economy. Therefore the performance of foreign investment during the seven major crises of the post reform period - the East Asian Crisis of 1997, the Pokhran Nuclear Explosion in 1998, the Stock Market Scam of 2001, the

Black Monday of May 17^{th} 2004, the Global Market Meltdown in 2006, the Global Financial Crisis of 2008 and the Brexit is examined here.

6.4.2.1 Foreign Investment in India during the East Asian Crisis

During East Asian Crisis[247] which started in July 1997 and continued till early 1998, the foreign investors behaved almost panically as can be seen in Table 6.16 and Figure 6.8. During this crucial period of roughly nine months Indian capital market witnessed an erosion of capital in an unprecedented manner and in January 1998 foreign portfolio investment became negative, i.e., outflow of FPI exceeded its inflow.

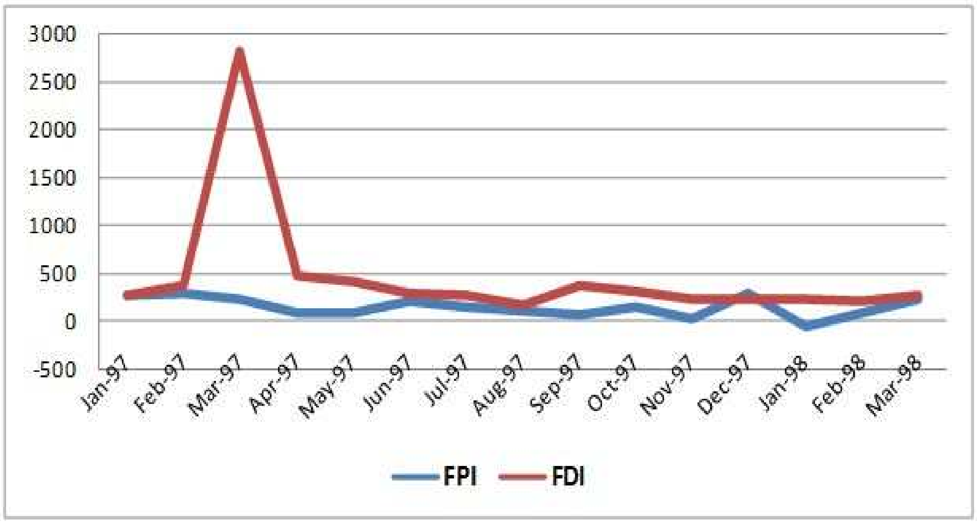

Figure 6.8: Erosion of Foreign Capital from the Indian Economy during the East Asian Crisis

[247] South Korea, Philippines, Malaysia, Indonesia, Thailand, Singapore, Hong Kong and Taiwan came to be known as the Asian Tigers due to their sustained growth over a long period of time. The early part of the 1990s saw huge capital flows into these economies. These capital flows led to massive investment and high growth in the economies. Suddenly, by mid 1990s the macroeconomic fundamentals, particularly the current account of these economies began to deteriorate. The crisis began with the crash of the Thai Baht, which led to a currency crisis in the Tiger economies. By the end of 1997, Malaysian ringitt, the Indonesian rupiah, the Philippine peso and the Korean won lost between 44 and 56 per cent of their values against the American dollar.

Table 6.16: Erosion of Foreign Capital from the Indian Economy during the East Asian Crisis

Month	FPI (US $ Million)	FDI (US $ Million)
January 1997	276	262
February 1997	282	359
March 1997	230	2821
April 1997	78	473
May 1997	78	408
June 1997	200	283
July 1997	150	271
August 1997	110	163
September 1997	70	359
October 1997	152	297
November 1997	21	231
December 1997	287	225
January 1998	-57	226
February 1998	88	203
March 1998	231	257

Source: Handbook of Statistics on the Indian Economy, 2010-11.

6.4.2.2 The Pokhran Nuclear Explosion of 1998 and Foreign Investment in India

The aftermath developments of the Pokhran Nuclear Explosion of May 1998[248] witnessed high volatility in the Indian capital market. Immediately after the explosion, USA declared sanctions against India. Other countries like Japan followed the suit. The result was a confidence crisis and the foreign investment reacted. The impact was severe, which is demonstrated in Table 6.17 and Figure 6.9. Immediately after the explosion USA started sanction against India and consequently FPI flows became negative during several months succeeding the explosion.

[248]Pokhran-II was the series of five nuclear bomb test explosions conducted by India at the Indian Army's Pokhran Test Range in May 1998. It was the second Indian nuclear test; the first test, code-named Smiling Buddha, was conducted in May 1974. Pokhran-II consisted of five detonations, of which the first was a fusion bomb and the remaining four were fission bombs. These nuclear tests resulted in a variety of sanctions against India by a number of major countries, including Japan and the United States.

Table 6.17: Pokhran Nuclear Explosion and Capital Erosion from the Indian Economy

Month	FPI (US $ Million)	FDI (US $ Million)
February 1998	-88	203
March 1998	231	257
April 1998	-31	275
May 1998	-115	210
June 1998	-269	377
July 1998	-26	117
August 1998	-48	130
September 1998	-43	141
October 1998	-140	66

Source: Handbook of Statistics on the Indian Economy, 2010-11.

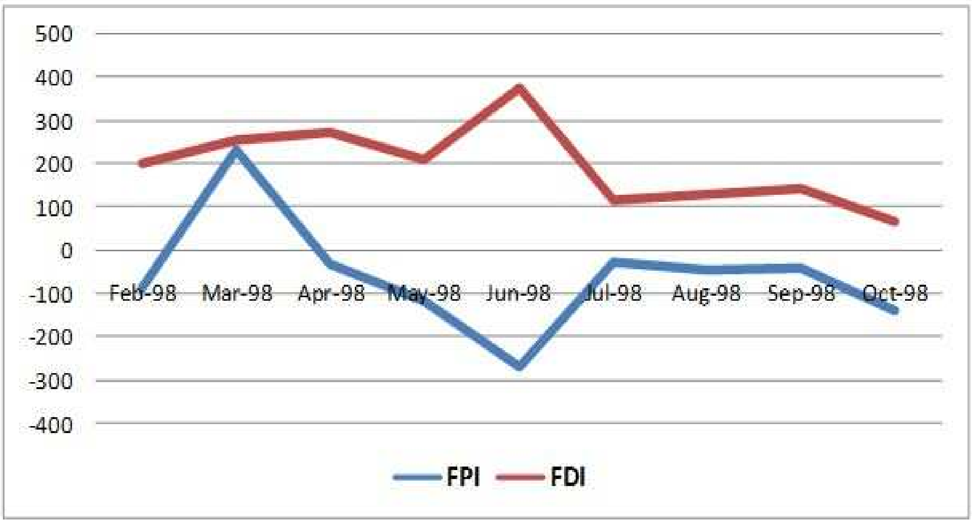

Figure 6.9: Pokhran Nuclear Explosion and Capital Erosion from the Indian Economy

6.4.2.3 Foreign Investment in India during the Stock Market Scam of 2001

The Stock Market Scam of 2001[249] was a major shock which Indian capital market felt. During this scam foreign investors too behaved in an abnormal

[249]The Stock Market Scam of 2001 is attributed to the market manipulation by Ketan Parekh. Parekh siphoned off money from banks like Global Trust Bank and accumulated stocks of nearly 10 companies (which came to be called the KP 10 stocks) whose prices skyrocketed. This was the time during which even the

manner as illustrated in Table 6.18 and Figure 6.10. During this scam volatility occurred not in the form of FPI outflows but in the form of FPI inflows carried over by the manipulations of Kethen Parake.

Table 6.18: Foreign Investment Flows during the Stock Market Scam of 2001

Month	FPI (US $ Million)	FDI (US $ Million)
September 2000	246	91
October 2000	-231	176
November 2000	78	113
December 2000	116	181
January 2001	451	335
February 2001	670	193
March 2001	486	162

Source: Handbook of Statistics on the Indian Economy, 2010-11.

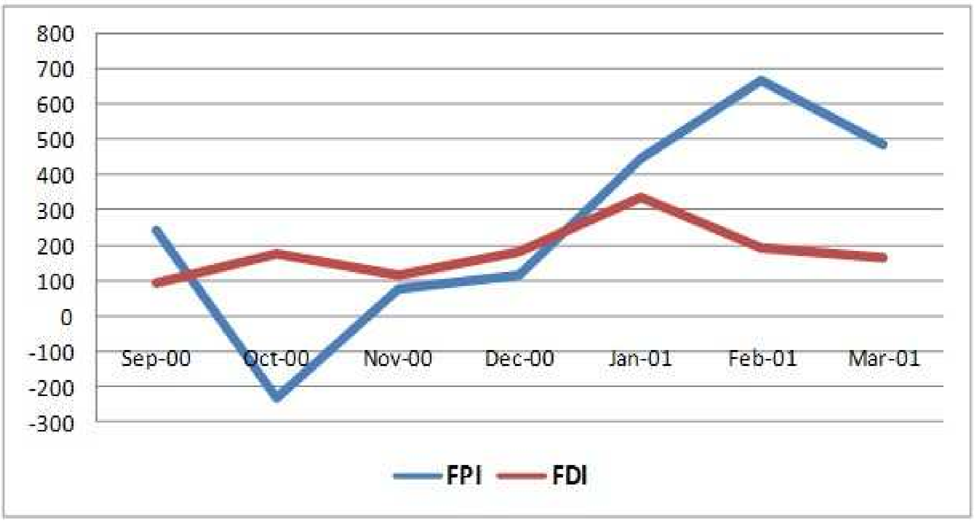

Figure 6.10: Foreign Investment Flows during the Stock Market Scam of 2001

foreign investors were waiting for the news of what Ketan Parekh was buying into. The leveraging process became unsustainable, the carried forward positions became unmanageable and finally the market crashed.

6.4.2.4 Foreign Investment in India around the Black Monday of May 17, 2004

In May 2004, the Indian market experienced extreme volatility and on May 17 2004[250], the Sensex index of the Indian capital market crashed by nearly 840 points in intra-day trade and there were market halts for the first time after the introduction of circuit breaker rules. Table 6.19 and Figure 6.11 shows foreign investment behavior around the Black Monday of 2004.

Table 6.19: Foreign Investment Flows around Black Monday of May 17, 2004

Month	FPI (US \$ Million)	FDI (US \$ Million)
February 2004	738	382
March 2004	1834	168
April 2004	938	217
May 2004	-314	217
June 2004	-467	380
July 2004	-410	173

Source: Handbook of Statistics on the Indian Economy, 2010-11.

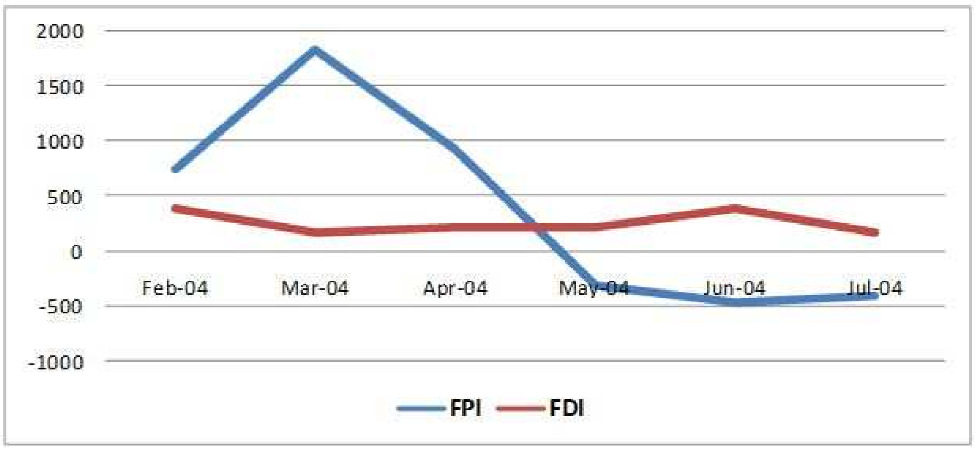

Figure 6.11: Foreign Investment Flows around Black Monday of May 17, 2004

[250]Totally unexpected political development was the main factor for such a collapse. The UPA government which came to power was supported by the left parties and the leaders of the left made comments regarding the rollback of reforms. The result was utter panic in the market and afraid of political instability and set back in reforms. The market stabilized when Mr. P. Chidambaram assumed charge as the Finance Minister, who was well known for his pro-reform attitude and Dr. Manmohan Singh became the Prime Minister. The market cooled off soon.

6.4.2.5 Foreign Investment in India during Global Market Meltdown of 2006

Another episode of a serious Indian capital market crash occurred in June 2006[251]. It was part of the global market meltdown. The Table 6.20 and Figure 6.12 present the behavior of foreign investors during this crisis.

Table 6.20: Foreign Investment Flows during the Global Market Meltdown of 2006

Month	FPI (US $ Million)	FDI (US $ Million)
January 2006	1545	482
February 2006	1821	127
March 2006	966	1240
April 2006	3711	661
May 2006	-3334	538
June 2006	-903	523
July 2006	-309	1127

Source: Handbook of Statistics on the Indian Economy, 2010-11.

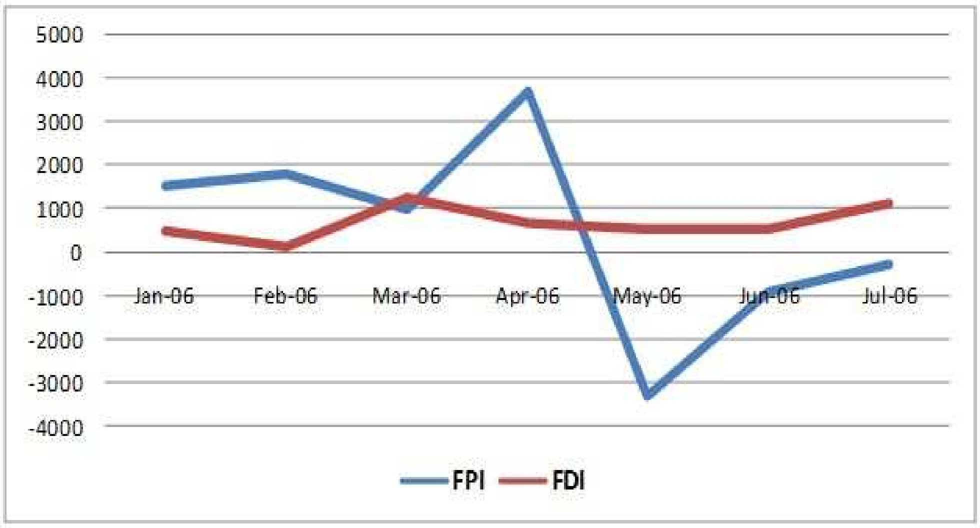

Figure 6.12: Foreign Investment Flows during the Global Market Meltdown of 2006

[251]Global Market Meltdown 2006 was triggered by the crash in the metal prices on the London Metal Exchange which eventually became a global market meltdown.

6.4.2.6 Foreign Investment in India during the Global Financial Crisis of 2008-09

During the Global Financial Crisis of 2008-09[252] also there was extreme outflow of foreign investment as can be seen in Table 6.21 and Figure 6.13.

Table 6.21: Foreign Investment Flows during the Global Financial Crisis of 2008-2009

Month	FPI (US $ Million)	FDI (US $ Million)
April 2008	-880	3749
May 2008	-288	3932
June 2008	-3010	2392
July 2008	-492	2247
August 2008	593	2328
September 2008	-1403	2562
October 2008	-5243	1497
November 2008	-574	1083
December 2008	30	1362
January 2009	-614	2733
February 2009	-1085	1488
March 2009	-889	1956

Source: Handbook of Statistics on the Indian Economy, 2008-09

6.4.2.7 Foreign Investment in India during the Brexit

As in the case of economies all over the world the Brexit 2016, the decision of Britain to exit from the European Union, posed serious challenges to the Indian economy also. The behavior of foreign investors during those bad days

[252]The global financial crisis began in July 2007 when a loss of confidence by investors in the value of securitized mortgages in the United States resulted in a liquidity crisis. In September 2008 the crisis deepened, as stock markets worldwide crashed and entered a period of high volatility and a considerable number of banks, mortgage lenders and insurance companies failed in the following weeks. The immediate cause of the crisis was the bursting of the housing bubble in the United States which peaked in 2005-06. High default rates on 'sub-prime' lending mortgages led to the burst of the housing bubble. Every single developing region was affected by the global financial crisis and some countries have experienced even worse economic impacts than the United States in which the crisis started.

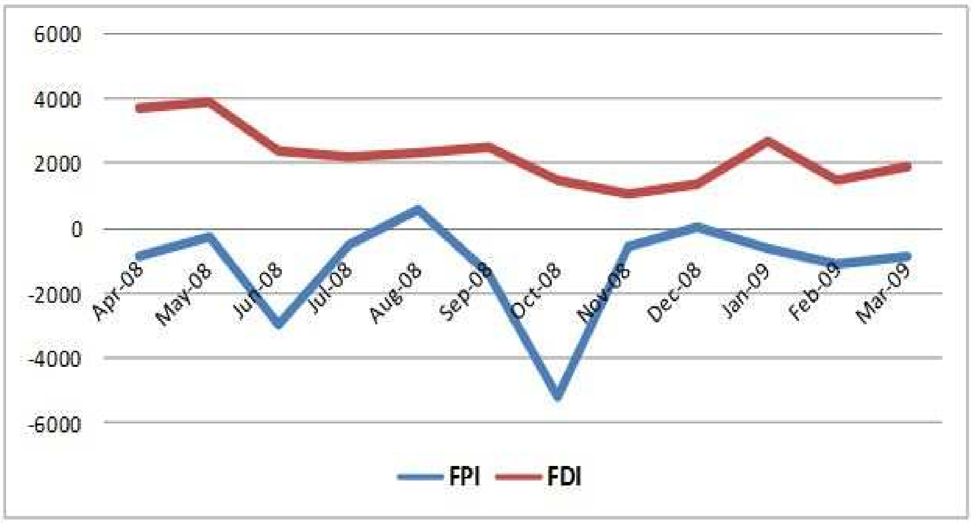

Figure 6.13: Foreign Investment Flows during Global Financial Crisis of 2008-2009

of Indian economy added more troubles and panic to the economy especially in her capital market. As can be seen from Table 6.22 and Figure 6.14, the foreign portfolio investment began to start its outflows on the eve of the actual Brexit itself i.e., in May 2016, much in anticipation of the Brexit and foreign portfolio investment became negative during two months.

Table 6.22: Foreign Investment during the Brexit 2016

Month	FPI (US $ Million)	FDI (US $ Million)
May 2016	-1621.85	1415.72
June 2016	-279.1	1677.72
July 2016	2266.55	4062.3
August 2016	1558.01	4783.78
September 2016	2884.01	5130.35

Source: Handbook of Statistics on the Indian Economy, 2017-18

Thus the above analysis shows that during the major economic crises the foreign investors withdrew their investments from India in an unprecedented manner. Their acts intensified the gravity of these crises in India. Thus in the Indian context also foreign investors proved themselves that they are only fair weather friends and foreign portfolio investment is hot money.

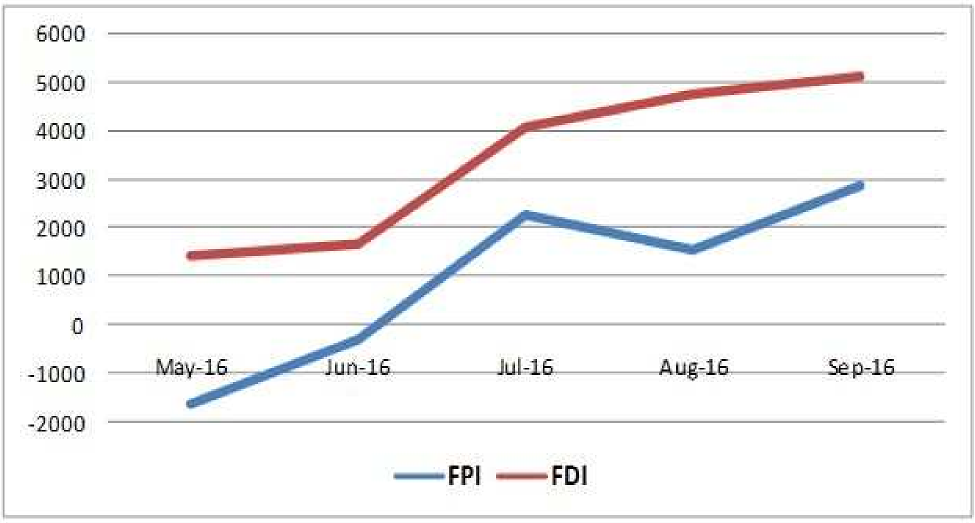

Figure 6.14: Foreign Investment Flows during the Brexit

6.5 Statistical Test of the Volatility of the Foreign Investment in the Indian Economy

In order to get a clear picture of the volatility of foreign investment in India especially of FPI, an empirical analysis is made in the background of FDI, which is generally known as a non-volatile capital.

6.5.1 Volatility of Foreign Investment in India - GARCH Test

The volatility pattern of FDI and FPI in India is studied separately by using the Generalized Auto Regressive Conditional Heteroscedasticity (GARCH) Model based on time series data which consists of monthly average flows of foreign investment from 1995 to 2018 and their results are given in Table 6.23 and 6.24 respectively. This model is found valid as the value of ARCH and GARCH are highly significant and the sum of the both is less than 1.

ARCH value shows that current news has a positive impact on the volatility. Historical volatility impact is represented by GARCH which is also positive and equal to recent news impact. It is also found from the analysis that the sum of ARCH and GARCH coefficients ($\alpha + \beta$) is very close to one, indicating

Table 6.23: Volatility of FDI in India

Dependent Variable: FDI				
Method: ML ARCH - Normal distribution (BFGS / Marquardt steps)				
GARCH = C(2) + C(3)*RESID(-1)^2 + C(4)*GARCH(-1)				
Variable	**Coefficient**	**Std. Error**	**z-Statistic**	**Prob.**
C	247.6934	12.43068	19.92597	0.001
Variance Equation				
C	77197.91	6797.824	11.35627	0.001
RESID(-1)^2	1.268252	0.245799	5.159719	0.001***
GARCH(-1)	0.17869	0.080064	2.231838	0.0256**
R-squared	-0.602503	**Mean dependent var**	1370.297	
Adjusted R-squared	-0.602503	**S.D. dependent var**	1449.018	
S.E. of regression	1834.312	**Akaike info criterion**	16.54797	
Sum squared resid	8.82E+008	**Schwarz criterion**	16.6023	
Log likelihood	-2172.058	**Hannan-Quinn criter.**	16.5698	
Durbin-Watson stat	0.310849			

** Significant at 5% ***Significant at 1%

Table 6.24: Volatility of FPI in India

Dependent Variable: FPI				
Method: ML ARCH - Normal distribution (BFGS / Marquardt steps)				
GARCH = C(2) + C(3)*RESID(-1)^2 + C(4)*GARCH(-1)				
Variable	**Coefficient**	**Std. Error**	**z-Statistic**	**Prob.**
C	232.329	8.528461	27.24161	0.001
Variance Equation				
C	42.22532	45.40141	0.930044	0.3523
RESID(-1)^2	0.409718	0.065847	6.222281	0.001***
GARCH(-1)	0.739511	0.032292	22.90073	0.001***
R-squared	-0.036018	**Mean dependent var**	846.5393	
Adjusted R-squared	-0.036018	**S.D. dependent var**	3242.518	
S.E. of regression	3300.397	**Akaike info criterion**	16.6606	
Sum squared resid	2.85E+009	**Schwarz criterion**	16.71493	
Log likelihood	-2186.869	**Hannan-Quinn criter.**	16.68244	
Durbin-Watson stat	1.875543			

*** Significant at 1%

that volatility shocks are quite persistent. In the case of FDI the coefficient of GARCH term is found smaller than ARCH term, which indicates that effect of recent news volatility is higher than past or historical volatility. In the case of FPI the coefficient of the GARCH term is found larger than ARCH term, which indicates that effect of past volatility is higher than the recent information. Since the total of ARCH and GARCH term is less than one, it shows that model is perfectly structured. In short, as per these tests both FDI and FPI in India are found volatile.

6.5.2 Volatility of Foreign Investment - Statistical Analysis

The above referred volatility of foreign investment is further analyzed with the help of descriptive statistics like mean, standard deviation, coefficient of variation and skewness.

Table 6.25: Descriptive Statistic of Volatility of Foreign Investment in India

Foreign Investment	Mean Statistic	Minimum Statistic	Maximum Statistic	Skewness Statistic	Standard Deviation	Coefficient Of Variation
FDI	1370	58	6177	1.22	1449	105
FPI	846	-19811	28704	1.67	3242	383

Source: Compiled by the Researcher

Though both form of foreign investment i.e., FDI and FPI are volatile as seen in Table 6.25, it is found that FPI is more volatile than to FDI. As all the three statistic give consistent result i.e., standard deviation of FPI value is 3242 whereas it is only 1449 in the case of FDI, the skewness of FPI is higher than the FDI i.e., 1.67 and 1.22 respectively and the coefficient of variation of FPI is also higher than FDI i.e., 383 and 105 respectively, FPI is seen more volatile than FDI.

This chapter began with a justification for the special treatment of the impact of the foreign investment on the capital market i.e., significance of the capital market in the Indian economy, capital market is the major domain and vibrant part of foreign investment in India and of the most prominent risk of foreign investment - volatility - is in the realm of the capital market.

The impact of foreign investment in the capital market is studied under four heads - impact of the foreign investment on the stock return, impact of foreign investment on sectoral indices, impact of foreign investment on the development of the capital market and impact of foreign investment on volatility of the capital market. The impact of foreign investment on stock return is studied in relation to other factors which influence the stock return viz interest rate, exchange rate, index of industrial production, inflation, gold price and it is found that along with these factors foreign investment (FII) also impacts stock return positively. With the help of Regression Analysis it is also found that FIIs are more focused on the banking sector and least concentrated on information technology sector. And the finding that the highest return is from the banking sector reinforces the impact of foreign investment on stock return.

The impact of foreign investment on the development of the capital market is studied in relation to the generally accepted indicators of the development of capital market like liquidity, market capitalization, reduction of transaction costs, modernization, corporate governance etc. Mainly with the help of Granger Causality Test it is found that with regard to all these indicators foreign investment has played a great role i.e., foreign investment could:-

1. produce an upward movement in the liquidity of the Indian capital market as is indicated by the increase of market turnover since the advent of foreign investment
2. increase market capitalization (size of the capital market) especially the market capitalization of large cap companies
3. increase P.E. Ratio
4. reduce transaction costs and
5. bring about other developments like increase in the number of listed companies, improvement in the corporate governance, introduction of online trading etc.

Finally the volatility of foreign investment in India especially the impact of foreign investment on the volatility of the Indian capital market is studied by analyzing the trend of foreign investment inflows and outflows during the period under study, by analyzing the behavior of foreign investors during seven episodes of Indian economy's stress and strain and by conducting a volatility test.

Even without the volatility test it is found that foreign investment in India as a whole is volatile but FPI is found more volatile than FDI; foreign portfolio investment in the capital market inflows have always been accompanied by almost a similar quantity of outflows; and during the days of Indian economy's stress and strain foreign investment in India witnessed heavy outflow proving that in the Indian context foreign investors proved themselves that they are only fair weather friends and foreign portfolio investment is hot money.

The volatility test conducted by taking the net capital flows during the period under study also confirmed that foreign investment in India in general and FPI in particular is volatile proving that in the Indian context also FPI proved to be more volatile than FDI. However high volatility is not seen especially during normal times. When this comparatively high volatility of FPI and comparatively low volatility of FDI are taken together foreign investment in India as a whole does not appear to be dangerously volatile.

The credit of the positive impact of the foreign investment on the macroeconomic variables seen in the previous chapter deserved to be attributed to the positive impact of foreign investment in the capital market also. In other words it is when the deep impact of foreign investment on the capital market joined hands with the impact of foreign direct investment that foreign investment produced positive impact in the Indian economy.

The explorations made so far in the previous chapters took this study to take the following generalization. The impact of foreign investment on the Indian economy is not only significant but positive too. The analyses made to reach this conclusion and the findings came across during this process is summarized in the coming chapter, the concluding chapter.

Chapter 7

Findings and Conclusion

This study began by ascertaining the academically endorsed and historically experienced potential of foreign investment - being a non-debt capital - to impact the host economies. As a prelude and a preparation to make an empirical analysis of this proposition in the Indian context - i.e., how far foreign investment impacted the Indian economy - the literature related to this area, the steps taken by the government to attract foreign investment to India, the character and quantity of such investments reached here and the factors which motivated foreign investors to invest in India were examined. Then the Indian economy as a whole is approached from its parts - the macro economic variables with special reference to the capital market. And an analysis, mainly econometric, is made to find out whether there exist a relationship between these variables and foreign investment with the assumption that the existence of relationship implies the existence of impact which may be positive or negative. This chapter - the concluding one - highlights what is found during the study and analysis of this process as well as at its end with a formal conclusion having the nature of criticisms, observations, suggestions etc.

7.1 Findings of the Study

1. Since the economic reforms of the 1990s, India is witnessing huge flows of foreign capital. More or less identical trend is seen in the flows of the two

major channels of foreign investment i.e., FDI and FPI. Their compound annual growth rate is 26.68 percent and 39.31 percent respectively.

2. Foreign direct investors preferred to invest in India through equity capital when compared to the other two components of foreign direct investment i.e., reinvested earnings and other forms of capital. In the total FDI flows the share of equity capital was 68 percent, reinvested earnings 27 percent and 5 percent for the rest.

3. The most preferred sector of the Indian economy by the foreign direct investors are the service sector. Telecommunication, computer hardware and software, construction and development, automobile industry, drugs and pharmaceuticals etc. are their other favoured sectors.

4. Foreign direct investment in India is unevenly distributed or more precisely concentrated in two regions Mumbai and New Delhi i.e., 30 and 19 percent of the FDI is focused on these two regions respectively.

5. Major portion of the foreign direct investment in India comes from two countries, Singapore and Mauritius. The individual contribution of the great economic powers to the Indian foreign direct investment arena is very negligible. It does not amount to more than a single digit percentage.

6. Foreign portfolio investment in India has become investment by foreign institutional investors and now they emerged as the star of foreign portfolio investment in India. Out of the cumulative portfolio investment, FIIs' contribution was 87 percent, while 12 percent came through GDR/ADR issues and the remaining one percent through Offshore Funds.

7. Out of the two areas of foreign portfolio investment - equity and debt - foreign portfolio investment is concentrated in equity i.e., 74 percent of FPI is concentrated on equity and only 26 percent is in debt.

8. As per the Auto Regressive Distributed Lag (ARDL) model conducted by taking foreign investment as dependent variable and other macroeconomic variables which have a bearing up on the determinants of foreign investment in India as independent variables, it is seen that the most important determinant of foreign investment in India as a whole is the

economic growth which is represented through the Index of Industrial Production (IIP) in the context of foreign investment. In the case of foreign direct investment besides the economic growth two other macroeconomic variables i.e., exchange rate and inflation also found significantly impacting foreign direct investment in India. But in the case of foreign portfolio investment the most important factor acted as determinant is stock return. But it is seen that foreign portfolio investment is not determined by inflation and exchange rate. However, the generally believed factor i.e., trade openness, the associate of liberalization showed only negative impact on the arrival of foreign direct investment in India mainly because of the dominance of import over export, indicating that liberalization did not serve as a cause but served only as a spark to flame the arrival of foreign investment in India.

9. Foreign investment has made its presence and impact in almost all the major macroeconomic variables of the Indian economy. It is found that foreign investment has

   (a) played a crucial role in financing India's current account deficit by contributing substantially to the capital account and thereby making India's balance of payments a balancing one to a very great extent.

   (b) become the dominant creator of forex reserves in India. It is seen that both foreign direct investment and foreign portfolio investment have a positive impacts on foreign exchange reserves in the long run and in the short run. The Vector Error Correction Model (VECM) revealed that in the long run Foreign Direct Investment (FDI), Foreign Portfolio Investment (FPI) and Exports (EXP) have positive impact on Foreign Exchange Reserves (FER) whereas Import (IMP) and Exchange Rate (REER) volatility have negative impact and their relationship is statistically significant. In the VEC Granger Causality/ Block Exogeneity Wald Test, it is found that in the short run, the role of Foreign Direct Investment (FDI), Foreign Portfolio Investment (FPI) and Exports (EXP) are statistically significant in influencing the variation of Foreign Exchange Reserves (FER) while the role of the variables like Import (IMP) and Exchange Rate (REER) are found statistically insignificant.

(c) led to the appreciation of the rupee and thereby positively impacted the exchange rate of India. In the Vector Error Correction Model (VECM) it is found that both forms of foreign investment i.e., FDI and FPI have positive impact on exchange rate in the long run while Inflation (WPI) and Import (IMP) have only negative impact. According to the VEC Granger Causality/ Block Exogeneity Wald Test in the short run, foreign portfolio investment exercises more positive impact on the exchange rate than the FDI. That is in the short run Foreign Portfolio Investment (FPI) is found as the major factor responsible for the appreciation of Indian rupee whereas the role of Foreign Direct Investment (FDI), Import (IMP) and Inflation (WPI) are found statistically insignificant.

(d) both forms of foreign investment made positive impact on the economic growth of the country in the long run and in the short run. When the Vector Error Correction Model (VECM) showed a long run positive relation between Foreign Direct Investment (FDI), Foreign Portfolio Investment (FPI), Export (EXP) and Inflation (WPI) on the Economic Growth (IIP), it showed that interest rate (IR) and exchange rate fluctuation (NEER) are negatively related to economic growth and their relationship is statistically significant. The VEC Granger Causality/ Block Exogeneity Wald Test showed that in the short run also Foreign Direct Investment (FDI), Foreign Portfolio Investment (FPI) and Inflation (WPI) are positively related with Economic Growth (IIP) and their relationship is statistically significant but it showed only insignificant relationship between Export (EXP) and Exchange Rate (NEER).

10. It is seen that in the long run there is a positive relationship between foreign investment and inflation in India indicating a negative impact of foreign investment on Indian economy. Though in the short run no significant relationship is found between foreign investment and inflation in India, in the long run a positive relation is found between both forms of foreign investment and inflation. It indicates that foreign investment leads to the increase of inflation in the country and in this respect foreign investment has an adverse impact on Indian economy.

According to the Vector Error Correction Model (VECM) in the long run, there is a clear and positive relationship between Foreign Direct Investment (FDI), Foreign Portfolio Investment (FPI) and Crude Oil Price (COP) with Inflation (WPI). At the same time Exchange Rate volatility (NEER) and Economic Growth (IIP) are found to have a negative relation with Inflation (WPI) and their relationship is statistically significant. However as per Block Exogeneity Wald Test in the short run no statistically significant relationship is found between Foreign Direct Investment (FDI), Foreign Portfolio Investment (FPI) and Inflation (WPI) but significant relationship is found between Crude Oil Price (COP), Economic Growth (IIP) and Inflation (WPI).

It implies that foreign investment by fuelling the inflation produced some negative impact on Indian economy. However since foreign investment did not lead the country to a two digit inflation (except a few occasions), it is concluded that the negative impact of foreign investment on Indian economy via inflation is not very severe as a moderate rate of inflation is not very adverse to an economy.

11. As a result of the non-debt capital flows via foreign investment, a significant decrease in the proportion between the total debt creating capital and non-debt creating capital take place. Before the eve of the advent of foreign investment i.e., in 1991 the debt service ratio was 30 but now it has shrunk to 7.5, the credit of which can be safely attributed to the foreign investment and the consequent result of huge flows of non-debt capital. Similarly when compared to countries like Spain, Portugal etc. whose external debt to GDP is more than 100 percent, India's ratio of external debt to GDP which was 38 in 1991 drastically came down to almost 20 percent, the credit of which also goes to foreign investment.

12. However, it is in the capital market of India that foreign investment made its most vibrant presence and produced tangible impacts extending to the whole economy. Out of the four aspects of the capital market studied viz stock return, sectorial indices, development of the capital market and volatility, except in the case of volatility, foreign investment made positive impacts which are tantamount to the impact on the economy as a whole.

    (a) When the impact of foreign investment on stock return is studied in relation to other factors which influence the stock return viz interest rate, exchange rate, index of industrial production, inflation, gold price, it is found that Foreign Institutional Investment (FII) produced positive impacts on stock return. This impact of foreign investment on stock return is more lucid in the Regression Analysis which manifested that banking sector, where there is a concentration of foreign investment, has produced the highest return.

(b) Foreign investment showed deep impact on almost all the sectoral indices at varying degrees. However it is very clear that FIIs have focused more on the banking sector and the least on the information technology.

(c) Foreign investment produced significant impact on all the aspects related to its development like liquidity, market capitalization (size of the market), Price Earnings ratio, reduction of transaction costs, corporate governance etc.

  (i) Foreign investment caused an upward movement in the stock market liquidity. The Granger Causality Test showed a significant and positive impact of FIIs flows on market liquidity.

  (ii) A positive relationship is seen between FIIs investment and market capitalization too. That is in accordance with the increase of foreign investment, the market capitalization is also found to be on the increase. The Regression Analysis showed significant relationship of foreign investment with all types of companies (large cap, mid cap and small cap) though they are focused more on the large cap and the least on the small cap companies.

  (iii) A positive relationship between foreign institutional investment and P.E. ratio of the capital market is established in the Granger Causality Test.

  (iv) Since the advent of foreign investment, considerable reduction of transaction costs like those related to trading fee, bad delivery, counter party risk, impact cost, stamp duty etc. has taken place as a result of the direct encounter with foreign investors and their financial technologies and because of the necessity of attracting foreign investors. Similarly it is realised that there has been a drastic reduction in the total transaction costs approximately from 4.75 percent in 1994 to 0.6 percent in 2018. Now with regard to transaction costs the Indian capital market ranks at par with the best in the world.

(v) Other developments in the capital markets like the improvement of corporate governance, introduction of online trading, increase in the number of listed companies etc. are the outcome of foreign investment as they were a necessary condition to attract foreign investment in the capital market or were the result of its arrival.

(d) Foreign investment especially foreign portfolio investment has inflicted the Indian economy with a high rate of volatility. It is found that foreign investment inflow in the capital market has always been accompanied by almost similar quantity of its outflows and this outflows had been very strong during the periods of the Indian's economy stress and strain.

The volatility test conducted (by taking the net capital flows during the period under study) showed that the volatility of FPI is more than the volatility of FDI. The descriptive statistics also showed consistent result. The standard deviation value and the skewness and coefficient of variation of FPI are found greater or higher than FDI. It is found that both form of foreign investment exhibited volatility but the volatility of FPI is found to be higher than that of FDI. Thus in the Indian context also FPI proved more volatile and hence a hot money than FDI.

However so far in India volatility of foreign investment is not found very high during normal times and hence did not produce any significant negative impact (except during a few isolated occasions) on the capital market. Thus when this comparatively high rate volatility of FPI and low rate of FDI taken together foreign investment in India as a whole did not seen to be dangerously volatile.

If the above findings related to the impact of foreign investment on the macro economic variables of the Indian economy are further extracted, it can be seen that except in the case of inflation and volatility, on all the other macroeconomic variables of her economy - balance of payments, foreign exchange reserves, exchange rate, economic growth, external debt and capital market - foreign investment exerted a positive impact. It is true that foreign investment is found as a contributing factor to inflation in the economy and thus exerted a negative impact on Indian economy. Yet it should be noted that this negative impact of foreign investment was not a serious one because during the period under study foreign investment did not lead the country to a high level of inflation. Hence as stated already a moderate level of inflation is unlikely to produce an adverse impact on the economy. The positive relation existing between foreign investment and inflation in India cannot be considered as a serious negative impact of foreign investment on her economy. Like manner the element of volatility associated with foreign investment is not found to be a very severe one. Between the two channels of foreign investment only FPI exhibited volatility and that too was not so alarming (except during a few isolated occasions).

Therefore it may be possible to conclude safely that foreign investment has a positive impact on the Indian economy. This is the outcome of the combined and indistinguishable contributions of both FDI and FPI, the two channels of foreign investment in India. Yet the study advocates a little preference for FPI because of the fact that the FPI appears to be more agreeable and adjustable to the social and political scenario of India.

The study recognises and admits the fact that it is because of the comparatively favourable conditions existed in India during the days of foreign investment that foreign investment could play a positive role in the Indian economy. This fact refrains the study from taking a futuristic view about the positive impact of foreign investment on the Indian economy. Instead, the uncertainties associated with the foreign investment and the present day world economic scenario like that of the fear of a world trade war compel the study to remind and warn that extreme dependence on foreign investment will be another gamble for the Indian economy. Hence it exhorts that along with the efforts to encourage foreign investment in India, the urgency to control the evils associated with foreign investment and to take enough precautionary measures like discouragement of import, encouragement of export, control of inflation etc. in order to withstand a sudden shock by way of withdrawal or discontinuance of foreign investment in India.

7.2 Suggestions

This study has been proceeding on two broad propositions - which it could prove - that huge amount of foreign investment has reached in India and they produced deep impact on the Indian economy. But now at the end of the study when looking back through a different angle, it can be seen that the foreign investment in India is not so huge as it is projected and appeared. That is despite the apparently huge amount of foreign investment in India, they still form only an average 2 percent of the GDP of the country. Similarly despite the strong back-up of the foreign non debt capital, Indian economy was never in a position to achieve a two digit growth. These two facts not only point out the existence of a wide space for foreign investment in India and the need of its effective use but also throws light on the deficiencies of the policies regarding foreign investment in India especially liberalization which requires some modification and change of approach.

Broadly speaking, liberalization in the context of foreign investment in India must include two things - removal of restrictions and relaxation of policies on the one hand and creation of the conditions necessary for the arrival and effective use of foreign investment on the other. So far what India has been following the former. Now it is necessary for the country to shift her emphasize towards the latter. Just as an individual's liberty is no longer considered as mere absence of restrictions but also creation of the necessary conditions for the fullest development of one's personality, liberalization along with the removal of restrictions should give equal or more importance for the creation of conditions necessary for the arrival and retention of foreign investment in India as well as rectification its defects. Hence as part of this change of approach attention may be given to the following.

So far India has been trying to attract maximum quantity of foreign investment to the country ignoring its qualitative aspects. A foreign investment which is highly vulnerable to volatility and hence highly risky cannot be considered as good quality foreign investment. So also the foreign investment reached so far in India, as they are not from developed countries with solid base, cannot be considered as a good quality foreign investment.

In the India's foreign investment scenario especially in her FDI front, the great economic powers have only a guest role. Their combined contribution is only less than 10 percent. On the other hand the lion's share of FDI in India i.e., more than 60 percent is from Singapore and Mauritius, the two foreign investment dependent countries. Some technical reasons like prevalence of Double Taxation Avoidance Law helped Mauritius to come to the fore front of foreign investment in India. (It is not denying that investment from some companies, which includes some dummy companies also, from these countries are also from the economic powers). The above situation limits the scope of foreign investment in India in two ways. Firstly it limits the scope of the widely claimed benefit of foreign direct investment i.e., technology transfer and secondly make foreign investment in India highly risky and vulnerable to the volatility. That is if those countries which invested in Singapore and Mauritius discontinue their investment in these countries or if a serious outflows take place there it will become a chain action and quite naturally Singapore and Mauritius will withdraw their investments or at least discontinue their investment in India with immediate repercussions and far reaching consequences in India. Under these circumstances it is very necessary for India to attract foreign investment directly from the great economic powers.

The main reason for the arrival of the poor quality of foreign investment to India is the existence of an exaggerated bad image of India outside the country, especially among the great economic powers. It is an undeniable fact that India is still considered as a highly backward undeveloped country inhabited by illiterate, intolerant, uncivilized people with strong anti-foreign sentiments, immersed in large scale corruption, internal conflicts, poor law and order conditions etc. The exaggerated elements of these beliefs and misgivings should be removed through wide propaganda and the facts remaining in them should be eradicated at any cost. Along with this, awareness should be created among the foreign investors about the fundamental strength of the economy, the developments she achieved in all fields, the existence of wide market, skilled man power, vast natural resource, the availability of various schemes of incentives for foreign investment etc. For the realization of this purpose even commercial advertisements may be given as certain African countries do. A fact finding committee may also be appointed to collect first hand facts from foreign countries which repel them from India and erase the unsound bias existing among them about India. In short creation of an image building scheme should form an integral part of liberalization. Besides it should also include steps to remove the existing draw backs of foreign investment in India.

Above all at the micro level it is necessary to ensure the corporate governance of the companies and at the macro level to ensure the credibility of the data of the economy and data analysing institutions like central statistical institutions of the country. Similarly it is also necessary to ensure the strength and credibility of the democratic institutions of the country like the courts to inculcate the faith of the foreign investors in the county and its economy.

One of the negative drawbacks of foreign investment in India is the uneven development of the various sectors of the Indian economy. Attractions of certain sectors and unattractiveness of certain others, the existence of restrictions to invest in certain sectors etc. are the main causes for these sectorial imbalances. Hence while restricting foreign investment in certain sectors, government should take positive steps to encourage investment in the neglected and backward sectors by way of tax holidays, tax concessions etc. for the investments in these sectors.

As in the case of sectoral concentration of foreign investment, concentration of foreign investment in certain regions of the country like Mumbai, New Delhi causes regional imbalances leading to the neglect of some backward regions. Here also government may take some positive steps to encourage investments in backward and neglected regions through the already mentioned schemes like tax holidays, tax concessions etc. Moreover it is high time to discourage or even to ban further foreign investments in congested areas like Bombay, New Delhi etc. by levying extra taxes and the like for the investments in these areas. In short positive liberalization must involve positive discrimination of sectors and regions for foreign investment in India.

Again, so far foreign investment has been looked at as a means for economic growth of the country. There should be a change in this approach. Instead, economic growth should also be used as a means for attracting foreign investment and retaining it in India in order to control the volatility of foreign investment to a certain extent. Foreign investment policy in India is based on a false belief that liberalization will be sufficient to attract foreign investment to the country. But the study revealed that it is not liberalization but economic growth in the case of FDI and in the case of FPI economic growth and stock return, are the determining factors for foreign investment in India. Hence in the foreign investment agenda top priority should be given for economic growth especially improvement in the IIP. Therefore the policy makers should consider enhancing the index of industrial production, the measuring rod of economic growth, by offering incentives and attractive benefits for the lagging industries in the economy because IIP being the indicator of the strength of the fundamentals of the economy has a magnetic power to attract foreign investments to the country.

It is a universal truth that foreign investment brings volatility - the uncertainties of foreign investment to the host economies. Though not in a big scale foreign investment in India also especially FPI exhibited volatility. Therefore all attempts in the direction of foreign investment must have built in safety valves to contain the risk of foreign investments especially volatility. Foreign investment in the capital market has now become the dictatorship of the FIIs. This dominance of the FIIs in the capital market is one of the main reasons for the capital market volatility in India. Because of their organizational strength, huge fund and power at their disposal the FIIs now direct the movements of the capital market as they desire through techniques like hedging.

Again, the extreme dependence of the FIIs on proxies leads to some sort of absentee investorship system and the denial of certain expected benefits of foreign institutional investment emerging from their superior knowhow related to the capital market. There are several occasions like those scandals related to Harshad Metha, Saytham Computers etc when the FIIs were are also emotionally and imprudently carried over just like the domestic investors. The only solution to these is to minimize the influences of FIIs in the capital market. It may be possible by encouraging and permitting foreign individual investors directly to invest in the Indian capital market. That is the dictatorship of the FIIs can be checked to a very great extent by further encouraging and liberalizing the entry of foreign individual investors, who are less organized and less powerful when compared to the FIIs, in the Indian capital market. Since the investment behavior of foreign individual investors will be entirely different from that of the FIIs it will become a check and balance of the investment behavior of the FIIs. Besides, stringent legislations are also necessary to control the FIIs along with the routine measures like lock in period, fixing of limits for the purchase of shares by the FIIs etc.

This study on the impact of foreign investment in India will remain incomplete unless an attempt is made to answer whether FDI or FPI has made more positive impact to the Indian economy and hence more suitable and to be encouraged in India. Generally speaking the two have distinct features, advantages and disadvantages and hence both are quite different in each other. Similarly their individual contributions to the positive impact of foreign investment in India are also indistinguishable and unidentifiable. For example it is seen that both came to India mainly attracted by her economic growth; both played almost equal contributions to the capital account and thereby played almost equal role in maintaining a fovourable balance of payments : both in the long run contributed significantly to the forex reserves, exchange rate and economic growth and both exhibited negative impact on economy by way of inflation. It is only with regard to volatility that both exhibited a clear distinction i.e., FPI is found more volatile. Therefore for the proper development of the country simultaneous operation of both is recommended. However a little more emphasize may be given for foreign portfolio investment (FPI) not because of its superior role over foreign direct investment (FDI) in impacting the Indian economy but because of certain characteristics of FDI are not suitable for the country. Though the permanent nature of FDI is a positive side of the FDI it necessitates the existence of foreign investment in the country for a long period whether we like or not. Long period of the foreign investment in the country in effect is long period of foreign presence in the country. People who have bitter experience of foreign rule may find it difficult to digest this. In this sense FDI may adversely affect the morale of the people and even their patriotism to a certain extent. Another widely claimed advantage of FDI is that it will help the transfer of technology to the country. This merit exists only in theory. It may not be wise to think that a foreign company will transfer technology to India just because it is permitted to invest in India. If they are willing to transfer their technology, during the present stage of the developed communication system, it is easy for us to absorb them even directly from foreign countries. Again opening of our economy to foreign investors like the multinationals gives an opportunity for the politicians for continuous agitations which will adversely affect future flows of foreign investment to India and even result in the deterioration of the relations with our benefactor countries. These problems when combined with the generally agreed demerits of FDI - drain of the national wealth, unhealthy competitions and destruction of native industries, loss of employment etc. - make it comparatively an unsuitable form of foreign investment in India.

It is not denying that foreign portfolio investment has no demerits. Of course it has serious draw backs like volatility but one need not fear that foreign investors will remain volatile always for no reasons. If the country can achieve strength in the fundamentals of the economy, especially economic growth and good return, foreign investors will cling to the economy. Moreover what the developing countries like India needs is not merely non debt capital but also liquid non debt capital. Foreign investment made in the capital market is more liquid than the investment made under FDI. Some of the already mentioned findings of the study like those related to foreign exchange reserves, exchange rate stability etc also argue for FPI in contrast to FDI.

The above preference advocated in favour of FPI is in no way a criticism of the more or less equal importance being given in India to both FDI and FPI or a recommendation of the reversal or discontinuance of the policy related to FDI in India. What is advocated here is only a little preference for FPI which should not be at the expense of the FDI.

7.3 Conclusion

By way of conclusion it is possible to say that foreign investment so far has not make any damaging impact on Indian economy. Instead it positively impacted the economy in manifold ways - from solving the balance of payments problem, increasing foreign exchange reserves, strengthening the exchange rate, reducing the debt service ratio and directly and indirectly boosting the economic growth. Foreign investment in the Indian capital market also achieved the target - it helped to increase the stock price, to develop and modernise the capital market and thereby facilitated wealth creation, domestic saving etc. and all these were achieved without seriously operating its much dreaded feature - volatility. Thus except in the case of inflation and volatility foreign investment showed positive and significant impacts on the Indian economy. Therefore it is concluded that foreign investment has a positive impact on the Indian economy.

However neither the main finding of the study - positive impact of the foreign investment of the Indian economy - nor the suggestions made here for its betterment are in no way a glorification or a recommendation of its permanency in India. One should not be tempted to reach eternal conclusion regarding foreign investment in India. He or she should bear in mind that the credit for the wonderful performance of foreign investment in India is not exclusively the credit of foreign investment alone. On the other hand they belong to the favourable conditions which have been existing in India during the days of foreign investment in the post liberalization period. Throughout the period under study, inflation has been moderate - never been two digit and inflation causing factors are almost dormant - the oil price was in a declining trend (except very recently), the country received moderate rain fall throughout the period, the country was free from internal and external conflicts and above all we have great economists at the helm of affairs who were always been keen to keep inflation under control mainly with the interest rate as a weapon ignoring the clamour for interest rate cut by the public. But tomorrow if troubles shoot up in a cluster in Indian economy by way of or as a result of inflation, exchange rate rise etc. either because of unprecedented crude oil price or because of a severe drought or flood or internal or external conflict or the occupancy of some populist economists at the helm of affairs, foreign investment will become a foe to the economy and will make a series of damaging impacts on the economy starting from intensification of inflation and volatility.

Therefore it may be concluded that by far the impact of foreign investment on the India economy is positive but such generalization and prediction about foreign investment in India is possible only on the condition which precede all laws in economics - other things remain the same - that is if exchange rate and economic growth are stable, inflation is under control etc. It is also important to point that the positive impacts of foreign investment on Indian economy can last long only if similar or strenuous efforts are made to retain the foreign investment reached India than to attract them to India. If so foreign investment will be an asset and very beneficial for the Indian economy. Otherwise it will not only be adverse but will be detrimental for her economy. Therefore it is also imperative for the country to tame foreign investment through rigorous and continuous restrictive policies, bearing in mind that foreign investment is like the transplantation of an alien body in a human body. Just as a human body must be prepared in advance to accept a foreign body, India must regularly prepare her economy to accept foreign investment and just as a human body which received a foreign body requires continuous monitoring, so also once foreign investment began to function in Indian economy it must be continuously monitored. Because in an economy ridden with high inflation, high interest rate, high exchange rate volatility etc. foreign investment will be highly inflammable as it will add fuel to the existing inflationary conditions and even ruin the host economies like that of India. Thus foreign investment contains seeds of destruction as well as seeds of construction. In an inflation driven economy the seed of destruction will grow fast and annihilate the whole economy. On the contrary in an economy with minor inflation its seeds of construction will take roots and bear abundant fruits.

All these imply that foreign investment is a not blank cheque received by the Indian economy and hence it should not be allowed to ride through the Indian economy unbridled. Moreover it contains a warning as well as a reminder that extreme dependence on foreign investment will be another gamble for Indian economy. Because like monsoon we are uncertain about its arrival, the quantity and longevity of its shower on the horizon of the Indian economy as foreign investment need not to abide by our dictates. Similarly though we are aware of the volatility of foreign investment which is usually associated with the outflow of foreign investment, we are not aware of another face of foreign investment, perhaps a more ugly and dangerous one i.e., volatility related to inflow of foreign investment. As long as the compelling force - sovereign power - is inoperative behind foreign investment, neither India nor any other country can shape their economy anticipating foreign investment. Therefore we must learn to grow ourselves, produce in India itself (make in India) the maximum, export the maximum and import the minimum, control inflation etc. anticipating the likely days when the foreign investment flows change their direction or the sources of foreign investment become dry.

The legitimacy and worldwide acceptance and growth of foreign investment owe to the idea of globalization and the expectancy of the birth of a global village which still remains a mirage. As long as the grip of nationalism and sovereignty of nations remain strong, one must be sceptic about foreign investment because in a world scenario where mutual rivalries between nations and power blocs as an economic blockade. It is likely to become a political weapon to be used as a form of economic sanction to canvas other countries to the power blocs or to destroy the enemies. It is true that all types of foreign investments are not investments directly made by a county in another country. Yet the relation between the countries has a crucial role in foreign investment flows between those countries. In other words foreign investment is an extension of the political relations between the nations. One day if the relation between the two nations deteriorate an outflow of foreign investment will definitely take place. India's bitter experience followed by the Pokhran nuclear explosion is a living testimony. The Pokhran nuclear explosion irritated the US and it initiated economic sanction against India which was followed by huge outflows of foreign investments especially investments from the capital market. The recent deterioration of the relation between USA and China and the consequent sharp fall in China's foreign investments from the USA further testifies this. In this way foreign investment forces India to maintain good relations, whether it likes or dislikes, with the investing countries here not only to attract further foreign investments from them but also to retain the investments she has already received from them. In this respect way foreign investment is a limitation on India and its sovereignty. All these again point out to the fact that India must be vigilant and cautious about the likelihood disappearance of the greeneries of her economy created by the foreign investment as future alone can prove whether these are bubbles or pebbles.

This study is winding up incidentally at a time when the fear of a global trade war is looming large and threatening to swallow the trade dispositions of the world. For this very reason it is not possible to conclude this study by signalling a bright future for foreign investment not only in India but else where. It is doubtful whether the ardent advocates of foreign investment are now so optimistic and enthusiastic about it as they had been a few years back. The world trade war, in the unfortunate event of its occurrence, will not be fought only with tariff but with all forms of weapons and among them foreign investment will definitely be a fierce weapon, perhaps more destructive in nature than the tariff weapon. It will become not only a weapon but also a victim of the war because world trade war will develop into a world economic recession which will witness massive foreign investment withdrawal shuffling the economies of the foreign investment linked countries like India. In short the present world scenario pauses certain ominous question marks on the future of the foreign investment everywhere as it does on the future of the global economic order.

7.4 Scope for Further Research

Foreign investment in India especially since globalization is an ever-growing and expanding phenomenon with far reaching implications and impacts. This fact essentially demands and necessitates new and wider research in this area. It is presumed that some of the limitations of this study, especially those in the nature of serious omissions may open up new avenues for research. For example as pointed out above a study of the impact of foreign investment on Indian economy employing comparative method offers wide scope for further research. That is studies related to the impact of foreign investment on Indian economy may be made by making the following comparisons:-

a.) comparison between the impact of foreign investment on pre liberalization and post liberalization Indian economy,

b.) comparison between the impact of foreign investment on Indian economy and on another developing country's economy,

c.) comparison between developing countries which receive and which do not receive foreign investment,

d.) comparison between the impacts of foreign investment on different sectors of the Indian economy,

e.) comparison between the individual contribution and impact of FDI and FPI in the Indian economy etc.

Such comparisons may again pave the way for more research areas and thereby enlarge the frontiers of the subject.

Bibliography

[1] Abbas, Q., Akbar, S., Nasir, A., Amanullah, H., and Naseem, M. (2011). Impact of Foreign Direct Investment. *Global Journal of Management and Business Research*, 11(8), 143-157.

[2] Achsani, N.A. (2010). The Relationship between Inflation and Real Exchange Rate: Comparative Study between ASEAN, the EU and North America. *European Journal of Economics, Finance and Administrative Sciences*, 18, 69-76.

[3] Agarwal, R. (1997). Foreign Portfolio Investment in Some Developing Countries: A Study of Determinants and Macroeconomic Impact. *Indian Economic Review*, 32(2), 217-229.

[4] Agbloyor, E. K., Abor, J., Adjasi, C. K., and Yawson, A. (2013). Exploring the Causality Links between Financial Markets and Foreign Direct Investment in Africa. *Research in International Business and Finance*, 28(C), 118-134

[5] Agrawal, G., and Khan, M. A. (2011). Impact of FDI on GDP: A Comparative Study of China and India. *International Journal of Business and Management*, 6(10), 71-79.

[6] Ahmad, E., and Hamdani, A. (2003). The Role of Foreign Direct Investment in Economic Growth. *Pakistan Economic and Social Review*, XLI (1 & 2), 29-43.

[7] Ahn, Y.S., Adji, S.S., and Willett, T.D. (1998). The Effects of Inflation and Exchange rate Policies on Direct Investment to Developing Countries. *International Economic Journal*, 12(1), 95-104.

[8] Aijaz, H., Siddiqui, A., and Aumeboonsuke, V. (2014). Role of Interest Rate in Attracting the FDI: Study on Asean 5 Economy. *International Journal of Technical Research*, 2(3), 59-70.

[9] Akhtar, G. (2013). Inflows of FDI in India: Pre and Post Reform Period. *International Journal of Humanities and Social Science Invention*, 2(2), 1-11.

[10] Akinboade, O.A., Siebrits, F.K., and Roussot, E.N. (2006). Foreign Direct Investment in South Africa, in Ajayi (ed.) Foreign Direct Investment in Sub-Saharan Africa - Origin, Targets, Impact and Potential. *Nairobi: African Economic Research Consortium*, 177-208.

[11] Alam, M.M., and Uddin, M.G.S. (2009). Relationship between Interest rate and Stock price: Empirical Evidence from Developed and Developing Countries. *International Journal of Business and Management*, 4(3), 43-51.

[12] Ali, S., and Guo, W. (2005). Determinants of FDI in China. *Journal of Global Business and Technology*, 1(2), 21-33.

[13] Amita (2014). Determinants of FIIs: Evidence from India. *International Journal of IT and Knowledge Management*, 8(1), 85-95.

[14] Anitha, R. (2012). Foreign Direct Investment and Economic Growth in India. *International Journal of Marketing, Financial Services and Management Research*, 1(8), 108-125.

[15] Arockia B., and Soundararaj J .J. (2009). *The Impact of Foreign Direct Investment on Indian Economy, Excel Publications*, New Delhi.

[16] Asiedu, E. (2002). On the Determinants of Foreign Direct Investment of Developing Counties: Is Africa Different?. World Development, 30(1), 107-119. *World Development*, 30(1), 107-119.

[17] Atique, Z., Ahmad, M. H,. and Azhae, U. (2004). The Impact of FDI on Economic Growth under Foreign Trade Regimes: A Case Study of Pakistan. *The Pakistan Development Review*, 43 (4), 707-718.

[18] Awokuse, T.O. (2007). Causality between Exports, Imports, and Economic Growth: Evidence from Transition Economies. *Economics Letters*, 94 (3), 389-395.

[19] Babu, S., and Prabheesh, K.P. (2008). Causal Relationship between FIIs and Stock Returns in India. *International Journal of Trade and Global Market*, 1(3), 259-265.

[20] Baharom, A. H., Muzafar Shah, H., and Royfaizal, R. C. (2008). *The Relationship between Trade Openness*, Foreign Direct Investment and Growth: Case of Malaysia, MPRA Paper No. 11928, University Library of Munich, Germany.

[21] Baharumshah, A.,and Thanoon, M. (2006). Foreign Capital Flows and Economic Growth in East Asian Countries. *China Economic Review*, 17(1), 70-83.

[22] Bajpai, N., and Jeffrey, D.S. (2006). *Foreign Direct Investment in India: Issues and Problems.* Paper No. 759, Harvard Institute of International Development, Development Discussion Cambrige.

[23] Banga, R. (2003). *Impact of Government Policies and Investment Agreements on FDI Inflows*, Working Paper, No.116, Indian Council for Research on International Economic Relations, New Delhi.

[24] Bank Negara Malaysia (2006). Financial Stability and Payment Systems Report. Kuala Lumpur.

[25] Bansal, A., and Pasricha, J.S. (2009) . Foreign Institutional Investor's Impact on Stock Prices in India. *Journal of Academic Research in Economics*, 1(2), 255-270.

[26] Barro, R.J., and Becker, G.S. (1989). Fertility Choice in a Model of Economic Growth. *Econometrica*, 57(2), 481-501.

[27] Basu, P., and Morey, R.M. (1998). Stock Market Prices in India After Economic Liberalization. *Economic and Political Weekly*, 4(3), 355-358.

[28] Basu, P., Nayak, N.C., and Archana, V. (2007). Foreign Direct Investment in India: Emerging Horizon. *Indian Economic Review*, 42(2), 255-266.

[29] Beck, T., Demirguc-Kunt, A., and Levine, R. (1999). *A New Database on Financial Development and Structure*. World Bank Working Paper No. 2146, World Bank.

[30] Bekaert, G. and C. R. Harvey (2003) Emerging Markets Finance. *Journal of Empirical Finance*, 10:1-2, 3-56.

[31] Bekaert, G., Harvey, C.R. (1998). *Capital Flows and the Behaviour of Emerging Market Equity Return*. Working Paper 6669, National Bureau of Economic Research, Cambridge.

[32] Bengoa, M., and Sanchez-Robles, B. (2003). Foreign Direct Investment, Economic Freedom and Growth: New Evidence from Latin America. *European Journal of Political Economy*, 19(3), 529-545.

[33] Bevan, A., Estrin, S., and Meyer, K. (2004). Foreign Investment Location and Institutional Development in Transition Economies. *International Business Review*, 13(1), 43-64.

[34] Bhasin, N., and Khandelwal, V. (2013). Foreign Institutional Investment in India: Determinants and Impact of Crises. *The Indian Journal of Commerce*, 66(2), 1-15.

[35] Bhattacharya, B. (1994). Foreign Direct Investment in India. *Foreign Trade Review*, 28(4), 307-329.

[36] Billington, N. (1999). The Location of Foreign Direct Investment: An Empirical Analysis. *Applied Economics*, 31(1), 65-76.

[37] Bodla. B.S, and Bhati, U. (2004). FDI: Emerging Scenario. *Yojna*, 48(4), 21-27.

[38] Brink, N., and Viviers, W. (2003). Obstacles in Attracting Increased Portfolio Investment into Southern Africa. *Development Southern Africa*, 20(2), 213-236.

[39] Brown, R., Durbin, J., and Evans, J. (1975). Techniques for Testing the Constancy of Regression Relationships over Time. *Journal of the Royal Statistical Society*, Series B (Methodological), 37, 149-192.

[40] Bruno, M., and Easterly, W.(1998). Inflation Crises and Long-run Growth. *Journal of Monetary Economics*, 41(1), 3-26.

[41] Buyuksalvarci, A. (2010). The Effects of Macroeconomic Variables on Stock Returns: Evidence from Turkey. *European Journal of Social Sciences*, 14(3), 404-416.

[42] Carkovic, M., and Levine, R. (2000). *Does Foreign Direct Investment Accelerate Economic Growth?*. University of Minnesota, Working Paper.

[43] Chakrabarti, R. (2001). FII Flows to India: Nature and Causes. *Money and Finance ICRA Bulletin*, 2(7), 61-81.

[44] Chakraborty, C. and Nunnenkamp, P., (2008). Economic Reforms. FDI and Economic Growth in India: A Sector Level Analysis. *World Development*, 36(7), 1192-1212.

[45] Chandrasekher, C.P. (2007). Private Equity: A New Role for Finance?. *Economic and Political Weekly*, 42(13), 1136-1145.

[46] Chaudhary, G.M., Shah, S.Z.A., and Bagram, M.M.M. (2012). Do Exchange Rate Volatility Affects Foreign Direct Investment? Evidence from Selected Asian Economies. *Journal of Basic and Applied Scientific Research*, 2(4), 3670-3681.

[47] Chaudhuri, K., and Smiles, S. (2004). Stock Market and Aggregate Economic Activity: Evidence from Australia. *Applied Financial Economics*, 14(2), 121-129.

[48] Chawla, K., and Rohra, N. (2015). Determinants of FDI: A Literature Review. *The International Journal of Business and Management*, 3(3), 227-250.

[49] Chingarande, A., Karambakuwa, T. (2011). The Impact of Interest Rates on Foreign Direct Investment: A Case Study of the Zimbabwean Economy, *International Journal of Management Sciences and Business Research*, 1(5), 2226-2236.

[50] Chowdhury, M.N.M., Uddin, M.J., and Islam, M.S. (2014). An Econometric Analysis of the Determinants of Foreign Exchange Reserves in Bangladesh. *Journal of World Economic Research*, 3(6), 72-82.

[51] Chuhan, P., Claessens, S., and Mamingi, N. (1993). *Equity and Bond Flows to Asia and Latin America*. Policy Research. Working Papers No. 1160, The World Bank, Washington, DC.

[52] Dahlquist, M.,and Robertsson, G. (2001). Direct Foreign Ownership, Institutional Investors and Firm Characteristics. *Journal of Financial Economics*, 59(3), 413-440.

[53] De Grauwe P. (1988). *Exchange Rate Variability and the Slowdown in International Trade*. IMF Staff Papers No.35, 35(1), 63-84.

[54] Demirguc-Kunt, Asli, and E. Detragiache (1999). *Financial Liberalisation and Financial Fragility*. Proceedings of the World Bank Annual Conference on Development Economics, W.P. No 1917, The World Bank.

[55] Demirgue-Kunt, Asli and Ross Levine (1996). Stock Market Development and Financial Intermediation; Stylized Facts. *The World Bank Economic Review*, 10(2), 291-321.

[56] Denisia, V. (2010). Foreign Direct Investment Theories: An Overview of the Main FDI Theories. *European Journal of Interdisciplinary Studies*, 2(2), 53-59.

[57] Devajit, M. (2012). Impact of Foreign Direct Investment on Indian Economy. *Research Journal of Management Sciences*, 1(2), 29-31.

[58] Dhakal, D., Nag, R., Pradhan, G., and Upadhyaya, K.P. (2010). Exchange Rate Volatility and Foreign Direct Investment: Evidence from East Asian Countries. *International Business and Economics Research Journal (IBER)*, 9(7), 121-128.

[59] Dhamija, N. (2008). Foreign Institutional Investment in India - An Exploratory Analysis of Pattern Across Firms. *Margin-Journal of Applied Economic Research*, 2(3), 287-320.

[60] Drake, T.A., and Caves, R.E. (1992). Changing Determinants of Japanese Direct Investment in the United States. *Journal of Japanese and International Economics*, 6(1), 228-246.

[61] Duasa, J. (2007). Malaysian Foreign Direct Investment and Growth: Does Stability Matters. *Journal of Economic Co-operation*, 28 (2), 83-98.

[62] Duasa, J., and Kassim, S.H. (2009). Foreign Portfolio Investment and Economic Growth in Malaysia. *The Pakistan Development Review*, 48(2), 109-123.

[63] Durham, J.B. (2004). Absorptive Capacity and the Effects of FDI and EFPI on Economic Growth. *European Economic Review*, 48(2), 285-306.

[64] Ekpo, A.H. (1995). Foreign Direct Investment in Nigeria: Evidence from Time Series Data. *CBN Economic and Financial Review*, 35(1), 59-78.

[65] Ellahi, N. (2011). Exchange Rate Volatility and Foreign Direct Investment Behaviour in Pakistan: A Time Series Analysis with Auto Regressive Distributed Lag Application. *African Journal of Business Management*, 5(29), 116-125.

[66] Engle, R.F., and Granger, C.W.J (1987). Co-integration and Error Correction: Representation, Estimation and Testing. *Econometrica*, 55, 251-276.

[67] Falki, N. (2009). Impact of Foreign Direct Investment on Economic Growth in Pakistan. *International Review of Business Research Papers*, 5(5), 110-120.

[68] Fama, E., (1981). Stock Returns, Real Activity, Inflation and Money. *American Economic Review*, 71(4) 545-565.

[69] Frenkel, M., Funke, K., and Stadtmann, G.(2004). A Panel Analysis of Bilateral FDI Flows to Emerging Economies. *Economic Systems*. 2(2). 281-300.

[70] Friedman, M., and Schwartz, A. (1963). Money and Business Cycle. *Review of Economics and Statistics*, 45(1), 52-64.

[71] Froot,. K., and Ramadorai, T. (2002). *Currency Returns, Institutional Investor Flows and Exchange Rate Fundamentals*. NBER Working Paper Series 9080, National Bureau of Economic Research, Cambridge (MA).

[72] Garg, A., and Bodla, B.S., (2009). Determinants of FIIs Investment in Indian Stock Market. *Abhigyan*, 26(4), 12-24.

[73] Gastanaga,V. M., Jeffrey, B. N., and Pashamova, B. (1998). Host Country Reforms and FDI Inflows: How Much Difference Do They Make?. *World Development*, 26(7), 1299-1314.

[74] Gaurav, A. (2011). Impact of FDI on GDP: A Comparative Study of China and India. *International Journal of Business and Management*, 6(10), 132-140.

[75] Geske, R., and Roll, R. (1983). The Fiscal and Monetary Linkage between Stock Returns and Inflation. *The Journal of Finance*, 38(1), 1-33.

[76] Ghosh, S., and Herwadkar, S. (2009). *Foreign Portfolio Flows and Their Impact on Financial Markets in India*. Reserve Bank of India Occasional Papers, 30(3), 2-22.

[77] Ghoshal, M.K. (1990). Foreign Investment in India: Policy Lessons and Prospects. *Yojana*, 34(8), 17-19.

[78] Gjerde, O., and Saettem, F. (1999). Causal Relations among Stock Returns and Macroeconomic Variables in a Small Open Economy. *Journal of International Financial Markets Institutions and Money*, 9(1), 61-74.

[79] Godfrey, L.G. (1978). Testing Against General Autoregressive and Moving Average Error Models when the Regressors Include Lagged Dependent Variables. *Econometrica*, 46(2), 1293-1301.

[80] Gokhale, M.S., and Ramana, J.V. (2013). Causality between Exchange Rate and Foreign Exchange Reserves in the Indian Context. *Global Journal of Management and Business Research Finance*, 13(7), 449-456.

[81] Goldstein, M., Mathieson, D., and Timothy, L. (1991). *Determinants and Systematic Consequences of International Capital Flows in IMF Research Department*. Occasional Paper 77, Washington DC, IMF.

[82] Gordon, J., and Gupta, P. (2003). *Portfolio Flows into India: Do Domestic Fundamentals Matter?*. IMF Working Paper, Number WP/03/20.IMF, Washington, DC.

[83] Granger, C. W. J. (1969) Investigating Causal Relations by Econometric Models and Cross-spectral Methods. *Econometrica*, 37:3, 424-438.

[84] Granger, C. W. J. (1986) Developments in the Study of Co-integrated Economic Variables. *Oxford Bulletin of Economics and Statistics*, 48, 213-228.

[85] Gudaro, A. M., Chhapra, I. U., and Sheik, S. A. (2010). Impact of Foreign Direct Investment on Economic Growth: A Case Study of Pakistan. *Journal of Management and Social Sciences*, 6(2), 84-92.

[86] Gwartney, J. (2010). Institutions, Economic Freedom, and Cross-Country Differences in Performance. *Southern Economic Journal*, 75(4), 937-956.

[87] Hara, M., and Razafimahefa, F.I. (2005). The Determinants of Foreign Direct Investment into Japan. *Kobe University Economic Review*, 51, 21-34.

[88] Henry, P. (2003) Capital-account Liberalisation, the Cost of Capital and Economic Growth. *American Economic Review*, 93:2, 91-96.

[89] Hermes, N., and Lensink, R. (2003). Foreign Direct Investment, Financial Development and Economic Growth. *The Journal of Development Studies*, 40(1), 142-163.

[90] Himachalpathy, R., and Kavya, V.(2012). A Study on the Determinants of Foreign Direct Investment Inflows into India. *Journal of Development Studies*, 19(2), 207-212.

[91] Hsiao, F. S. T., and Hsiao, M. W. (2006). FDI, Exports, and GDP in East and Southeast Asia-Panel Data versus Time-Series Causality Analyses. *Journal of Asian Economics*, 17(6), 1082-106.

[92] Hsing, Y. (2008). Application of Monetary Models of Exchange Rate Determination for Poland. *South East European Journal of Economics and Business*, 3(2), 19-24.

[93] Hsueh, S. J., Hu, Y. H., and Tu, C. H. (2013). Economic Growth and Financial Development in Asian Countries: A Bootstrap Panel Granger Causality Analysis. *Economic Modelling*, 32, 294-301.

[94] Ibrahim, H., and Aziz, H. (2003). Macroeconomic Variables and the Malaysian Equity Market: A View Through Rolling Subsamples. *Journal of Economic Studies*, 30(1), 6-27.

[95] Imimole, B., and Enoma, A. (2011). Exchange Rate Depreciation and Inflation in Nigeria. *Business and Economics Journal*, 28(1), 1-12.

[96] Ivohasina, R., and Hamori, S. (2005). An Empirical Analysis of FDI Competitiveness in Sub-Saharan Africa and Developing Countries. *Economics Bulletin*, 6(20), 1-8.

[97] Jain, M., Meena, P. L., and Mathur, T. N. (2012). Impact of Foreign Institutional Investment on Stock Market with Special Reference to BSE: A Study of Last One Decade. *Asian Journal of Research in Banking and Finance*, 2 (4), 31-47.

[98] Janicki, H., and Wunnava, P. (2004). Determinants of Foreign Direct Investment: Empirical Evidence from EU Accession Candidates. *Applied Economics*, 36(5), 505-509.

[99] Jayachandran, G. (2012). FDI, Trade and Economic Growth in Singapore-Evidence from Time-Series Causality Analyses. *Journal of Research in Commerce, IT and Management*, 2(9), 66-70.

[100] Jenkins, C., and Thomas, L. (2002). *Foreign Direct Investment in South Africa: Determinants, Characteristics and Implications for Economic Growth and Poverty Alleviation.* Centre for the Study of African Economics, University of Oxford, London.

[101] Jhingan, M.L. (2005). *Macroeconomics Theory.* 10th Edition, Vrinda Publication Ltd, New-Delhi.

[102] Jordaan, A.C., and Eita, J.H. (2007). Export and Economic Growth in Namibia: A Granger Causality Analysis. *South African Journal of Economics*, 75 (3), 540-547.

[103] Kasman, A., and Ayhan, D. (2008). Foreign Exchange Reserves and Exchange Rate in Turkey: Structural Breaks, Unit Roots and Co-integration. *Journal of Economic Modeling*, 25(1), 83-92.

[104] Kaur, M., and Dhillon, S. (2010). Determinants of Foreign Institutional Investors Investment in India, *Eurasian Journal of Business and Economics*, 3(6), 57-70.

[105] Khan, G.S., and Mitra,P. (2014). A Causal Linkage between FDI Inflows with Select Macroeconomic Variables in India - An Econometric Analysis. *IOSR Journal of Economics and Finance*, 5(5), 2321-5933.

[106] Kim, D.D., and Seo, J.S. (2003). Does FDI Inflow Crowd Out Domestic Investment in Korea. *Journal of Economic Studies*, 30 (6), 605-22.

[107] Kim, K. (2003). Dollar Exchange Rate and Stock Price: Evidence from Multivariate Co-integration and Error Correction Model. *Review of Financial Economics*, 12(3), 301-313.

[108] Kiong, W. H., and Jomo, K. S. (2005). Before the Storm: The Impact of Capital Inflows on the Malaysian Economy. *Journal of the Asia Pacific Economy*, 10(1), 56-69.

[109] Kirchgassner, G., and Wolters, J. (2007). *Introduction to modern time-series analysis (1sted.)*. Springer Berlin Heidelberg Publisher. USA: New York.

[110] Kivyiro, P., and Arminen, H. (2014). Carbon dioxide emissions, energy consumption, economic growth, and foreign direct investment: causality analysis for Sub-Saharan Africa. *Energy*, 74, 595-606.

[111] Klein, M.W., Rosengren, E. (1992). *The Real Exchange Rate and Foreign Direct Investment in the United States: Relative Wealth vs. Relative Wage Effects*. NBER Working Paper, 4192.

[112] Konya, L. (2006). Exports and Growth: Granger Causality Analysis on OECD Countries with Panel Data Approach. *Economic Modelling*, 23(6), 978-992.

[113] Koojaroenprasit, S. (2013). Determinants of Foreign Direct Investment in Australia. *Australian Journal of Business and Management Research*, 3(08), 20-30.

[114] Kumar, N. (1998). Liberalisation and Changing Patterns of Foreign Direct Investments: Has India's Relative Attractiveness as a Host of FDI Improved?. *Economic and Political Weekly*, 33(22), 1321-1327.

[115] Kumar, R., and Gupta, H. (2010). FIIs Flows to India: Economic Indicators. *SCMS Journal of Indian Management*, 7(1), 104-116.

[116] Kumar, S. (2001). Does the Indian Stock Market Play to the Tune of FII Investments? An Empirical Investigation. *ICFAI Journal of Applied Finance*, 17, 441-449.

[117] Kyrkilis, D., and Pantelidis, P. (2003). Macroeconomic determinants of outward foreign direct investment. *International Journal of Social Economics*, 30(7), 827-36.

[118] layungbo, D.O., and Akinbobola, T.O. (2011). Foreign Exchange Reserves and Exchange Rates in Nigeria. Structural Breaks, Unit Roots and Cointegration Tests. *Journal of Social and Economic Development*, 13(2), 153-162.

[119] Levine, R. (1997). Financial Development and Economic Growth: Views and Agenda. *Journal of Economic Literature*, 35(2), 688-726.

[120] Levine, R., and Zervos, S. (1996). Stock Market Development and Long-run Growth. *World Bank Economic Review*, 10(2), 323-339.

[121] Levine, R., and Zervos, S. (1998). Stock Markets, Banks and Economic Growth. *The American Economic Review*, 88(3), 537-558.

[122] Lipsey, R.E. (2004). Home-and Host-Country Effects of Foreign Direct Investment in Challenges to Globalization: Analysing the Economics, University of Chicago Press, 333-382.

[123] Lutkepohl, H. (2005). *New Introduction to Multiple Time Series Analysis.* Springer-Verlag, Berlin.

[124] Maheswari J. (2015). Macroeconomic Determinants of Foreign Direct Investment in India. *International Journal of Economic and Business Review*, 3(2), 59-65.

[125] Majundar, S. K., and Chibber, P. (1998). Are Liberal Foreign Investment Good For India?. *Economic and Political Weekly*, 34(22), 267-270.

[126] Mani, U. H., and Baker J.C. (1997). Foreign Direct Investment in India: Problems and Prospects. *Foreign Trade Review*, 32(1), 16-28.

[127] Marta, B., and Robles, B. (2003). Foreign Direct Investment, Economic Freedom and Growth: New Evidence from Latin America. *European Journal of Political Economy*, 19(4), 529-545.

[128] Mathiyazhagan, K.M. (2005). *Impact of Foreign Direct Investment on Indian Economy: A Sectoral Level Analysis.* ISAS Working Paper, Institute of South Asian Studies Singapore.

[129] Mathur, V. (2001). *Trade Liberalisation and Foreign Direct Investment in India 1991-2000.* New Century Publications, New Delhi.

[130] Matyas, L., and Sevestre, P. (2008). *The Econometrics of Panel Data: Fundamentals and Recent Developments in Theory and Practise (2nd ed.).* Springer-Verlang Berlin Heidelberg Publisher. Germany: Berlin.

[131] Mayer. (1989). *Myths of the West: Lessons from Developed Countries for Development Finance.* W.P.S 301, The World Bank, Washington, D.C.

[132] Mina, W. (2007). The Location Determinants of FDI in the GCC countries. *Journal of Multinational Financial Management*, 17(4), 336-348.

[133] Mirchandani, A. (2013). Analysis of Macroeconomic Determinants of Exchange Rate Volatility in India. *International Journal of Economics and Financial Issues*, 3(1), 172-179.

[134] Mishra, P.K. (2010). The Estimation of Relationship between Foreign Investment Flows and Economic Growth in India. *Asian Economic Review*, 52(3). 521-531.

[135] Mohamed, S. E., and Sidiropoulos, M.G. (2010). Another Look at the Determinants of Foreign Direct Investment in MENA Countries: An Empirical Investigation. *Journal of Economic Development*, 35(2), 75-95

[136] Mohan, T. (2006). Neither Dread Nor Encourage Them. *Economic and Political Weekly*, 3(4), 95-98.

[137] Morrissey, O., Udomkerdmongkol, M., and Gorg, H. (2009). Exchange Rates and Outward Foreign Direct Investment: US FDI in Emerging Economies. *Review of Development Economics*, 13(4), 754-764.

[138] Mottaleb, A. K., and Kalirajan K, (2010). Determinants of Foreign Direct Investment in Developing Countries: A Comparative Analysis. *The Journal of Applied Economic Research*, 4(4), 369-404.

[139] Mubarik, Y.A. (2005). Inflation and Growth: An Estimate of the Threshold Level of Inflation in Pakistan, State Bank of Pakistan. *Research Bulletin*, 1(1), 35-44.

[140] Mugableh, M. I. (2013). Analysing the CO2 emissions function in Malaysia: Autoregressive distributed lag approach. *Procedia Economics and Finance*, 5, 571-80.

[141] Mukherjee, T.K., and Naka, A. (1995). Dynamic Relations between Macroeconomic Variables and the Japanese Stock Market: An Application of a Vector Error Correction Model. *Journal of Financial Research*, 18(2), 223-237.

[142] Nag, B., and Ray, P. (2004). Experience of Financial Sector Reform in India: A Comparison with Select South East Asian Countries. *Foreign Trade Review*, 38(3), 38-63.

[143] Nagaraj, R. (2003). Foreign Direct Investment in India in the 1990s: Trends and Issues. *Economic and Political Weekly*, 38 (17), 1701-1712.

[144] Nagraj, R. (1996). India's Capital Market Growth, Trends, Explanations and Evidence. *Economic and Political Weekly*, 31(35), 2553-61.

[145] Nair-Reichert, U., and Wienhold, D. (2001). Causality Tests for Cross-Country Panels: A New Look at FDI and Economic Growth in Developing Countries. *Oxford Bulletin of Economics of Statistics*, 63(2), 153-171.

[146] Naka, A., Mukherjee, T., and Tufte, D. (1998). *Macroeconomic Variables and the Performance of the Indian Stock Market*. Department of Economics and Finance, Working Paper No. 15, University of New Orleans.

[147] Naoroji, D. (1901). *Poverty and Un-British Rule in India*. Commonwealth Publishers. Ministry of Information and Broadcasting, Patiala.

[148] Narayan, P. K. (2005). The saving and investment nexus for China: evidence from co-integration tests. *Applied Economics*, 37(17), 1979-90.

[149] Nayak, D., and Choudhury, R. N. (2014). *A Selective Review of Foreign Direct Investment Theories, Asia - Pacific Research and Training Network on Trade*. ARTNETWorking Paper Series, No. 143, Bangkok.

[150] Newey, W. K., and West, K. D. (1994). Automatic lag selection in covariance matrix estimation. *The Review of Economic Studies*, 61(4), 631-53.

[151] Niti, B. (2012). *Foreign Direct Investment in India: Policies, Conditions and Procedure*. New Century Publication, New Delhi.

[152] Nonnenberg, M., and Mendonca, M. (2004). The Determinants of Direct Foreign Investment in Developing Countries. Proceedings of the 32th Brazilian Economics Meeting, Brazil.

[153] Nyarko, P.A., Nketiah-Amponsah, E., and Barnor, C. (2011). Effects of Exchange Rate Regimes on FDI Inflows in Ghana. *International Journal of Economics and Finance*, 3(3), 277-286.

[154] Oliver, B. (2000). *Macroeconomics*. Second Edition Prentice Hall New York.

[155] Onyeiwu, S., and Shrestha, H. (2004). Determinants of Foreign Direct Investment in Africa. *Journal of Developing Societies*, 20(1-2), 89-106.

[156] Osinubi, T.S., and Amaghionyeodiwe, L.A. (2009). Foreign Direct Investment and Exchange Rate Volatility in Nigeria. *International Journal of Applied Econometrics and Quantitative Studies*, 9(2), 83-116.

[157] Pagano, M. (1993). Financial Markets and Growth: An Overview. *European Economic Review*, 37(2), 613-622.

[158] Pal, K., and Mittal, R. (2011). Impact of Macroeconomic Indicators on Indian Capital Market. *The Journal of Risk Finance*, 12(2), 84-97.

[159] Pal, P. (2004). Foreign Institutional Investment in India. Research on Indian Stock Volatility, Vol.12, Emerald Group Publishing Limited.

[160] Patil, R.H. (2006). Current State of the Indian Capital Market. *Economic and Political Weekly*, 41(11), l001-1011.

[161] Patro, D., and Wald, P. (2005). Firm Characteristics and the Impact of Emerging Market Liberalisation. *Journal of Banking and Finance*, 29(7), 1671-1695.

[162] Patterson, K. (2010). *A primer for unit root testing: Palgrave texts in econometrics (1st ed.)*. Customer Services Department, Macmillan Distribution Ltd, Hound mills, Basingstoke. England: Hampshire RG216XS.

[163] Pesaran, B., and Pesaran, M. H. (2009). Time series econometrics using Micro-fit 5.0 (1st ed.). *Oxford University Press Publisher.* England: London.

[164] Pesaran, M.H., Shin, Y., and Smith, R.J. (2001). Bounds Testing Approaches to the Analysis of Level Relationships. *Journal of Applied Econometrics*, 16(2), 289-326.

[165] Philip, I.N., and Oseni, I.O. (2012). Monetary Policy, Exchange Rate and Inflation Rate in Nigeria: A Co-integration and Multi-Variate Vector Error Correction. *Research Journal of Finance and Accounting*, 3(3), 62-69.

[166] Poshakwale, S., and Chandra, T. (2007). *Impact of Foreign Portfolio Investments on Equity Market Co-movements: Evidence from the Emerging Indian Stock Market.* Emerging Market Group ESRC Seminar on International Equity Markets Co-movements and Contagion, Cass Business School, London.

[167] Prasad, A.C. (1994). Foreign Direct Investment in India: Some Basic Facts and Issues. *Foreign Trade Review*, 28(4), 307-329.

[168] Prasuna, C. A. (2000). Determinants of Foreign Institutional Investment in India. *Finance India*, 14(2), 411-421.

[169] Qayyum, U., and Mahmood, Z. (2013). *Inter-linkage between Foreign Direct Investment and Foreign Trade in Pakistan: Are They Complements or Substitute?.* Working Papers No. 91. Pakistan Institute of Development Economics Islamabad, Pakistan.

[170] Rai, K., and Bhanumurthy, N. R. (2004). Determinants of Foreign Institutional Investment in India. The Role of Return, Risk and Inflation. *The Developing Economics*, 42(4), 479-493.

[171] Raj, J., Dhal, S., and Jain, R. (2008). *Imported Inflation: The Evidence from India*. Reserve Bank of India Occasional Papers, 29(3), 69-117.

[172] Ramsey, J. B. (1969). Tests for Specification Errors in Classical Linear Least Squares Regression Analysis. *Journal of the Royal Statistical Society*, Series B, 31(2), 350-371.

[173] Rao, Chalpati, K.S., Murthy, M.R., and Ranganathan, K.V.R. (1999). Foreign Institutional Investment and the Indian Stock Market. *Journal of the Indian School of Political Economy*, 9(4), 423-454.

[174] Ratanapakorn, O., and Sharma, S.C. (2007). Dynamic Analysis between the US Stock Returns and the Macroeconomic Variables. *Applied Financial Economics*, 17(5), 369-377.

[175] Rathod, G.D. (2007). Private Equity: Creating Wealth for India Incorporated. *Portfolio Organiser*, 4(3), 14-23.

[176] Reenu, S. (2015). Trends and Determinants of Foreign Direct Investment in India: A Study of the Post-Liberalization Period. *South Asian Journal of Management*, 22(3), 96-98.

[177] Resende Jr. Carlos, (2010). *Determinants of Foreign Direct Investment in an Emerging Market Economy: Evidence from India*, Bryant University.

[178] Rishit, M. (2007). On Liberalizing Foreign Institutional Investment. *Economic and Political Weekly*, XLI(11) 991-1000.

[179] Romero, A.M. (2011). Comparative Study: Factors that Affect Foreign Currency Reserves in China and India. *The Park Place Economist*, X111, 79-88.

[180] Sahni, P. (2012). Trends and Determinants of Foreign Direct Investment in India: An Empirical Investigation. *International Journal of Marketing and Technology*, 2(8), 144-161.

[181] Sapna, H. (2011). *A Study of FDI and Indian Economy*. PhD Thesis, National institute of Technology, Kurukshetra, Haryana.

[182] Saraogi, R. (2008). *Determinants of FIIs Inflows: India*. MPRA Working Paper No.22850.

[183] Sau, R. (1994). Foreign Direct Investment, Foreign Portfolio Investment and Macroeconomic Stability. *Economic and Political Weekly.* XXIX(7), 386-390.

[184] Sbia, R., Shahbaz, M., and Hamdi, H. (2014). A contribution of foreign direct investment, clean energy, trade openness, carbon dioxide emissions and economic growth to energy demand in UAE. *Economic Modelling*, 36, 191-7.

[185] Scaperlanda, A. (1992). Direct Investment Controls and International Equilibrium: The US Experience. *Eastern Economic Journal*, 18(2), 157-170.

[186] Scaperlanda, A., and Maurer, L. (1969). The Determinants of US Direct Investment in the EEC. *American Economic Review*, 59(2), 558-568.

[187] Semuel, H., and Nurina, S. (2015). *Analysis of the Effect of Inflation, Interest Rates, and Exchange Rates on Gross Domestic Product (GDP) in Indonesia.* International Conference on Global Business, Economics, Finance and Social Sciences (GB15 - Thai Conference), Bangkok, Thailand.

[188] Sethi, N. (2012). Inflows and Their Macroeconomic Impact in India a VAR Analysis. *The Romanian Economic Journal*, 15(46), 93-142.

[189] Shaari, M.S., Hussain, N.E., and Abdullah, H. (2012). The Effects of Oil Price Shocks and Exchange Rate Volatility on Inflation: Evidence from Malaysia. *International Business Research*, 5(9), 106-119.

[190] Sharma, K. A. (1987). Case for a New Investment Statute. *Foreign Trade Review*, 22(1) 83-94.

[191] Singh, A. (1998). Liberalization, the Stock Market and The Market for Corporate Control; A Bridge too far for the Indian Economy. In I.J Ahluwalia and I.M.D Little (eds), India's Economic Reforms and Development. *Oxford University Press*, 1691-99.

[192] Singh, S. (2009). Foreign Direct Investment and Growth of States of India. Vision 2020 - Managerial Strategies and Challenge, *Wisdom Publications*, Delhi.

[193] Singhania, M., and Gupta, A. (2011). Determinants of Foreign Direct Investment in India. *Journal of International Trade Law and Policy*, 10(1), 64-82.

[194] Sohail, N., and Hussain, Z. (2009). Long-run and Short-run Relationship between Macroeconomic Variables and Stock Prices in Pakistan: The Case of Lahore Stock Exchange. *Pakistan Economic and Social Review*, 47(2), 183-198.

[195] Soros, G. (2004). The Crisis of Global Capitalism [Open Society Endangered] Viva Books, New Delhi.

[196] Srinivasan, P., and Kalaivani, M. (2010). Foreign Institutional Investment and Stock Market Returns in India: Before and During Global Financial Crisis. *The IUP Journal of Behavioural Finance*, 7(1-2), 59-75.

[197] Srinivasan, P., and Kalaivani, M. (2013). *Determinants of Foreign Institutional Investment in India: An Empirical Analysis*. MPRA Working Paper No. 43778, University Library of Munich, Germany.

[198] Srivastava, A. (2010). Relevance of Macro Economic Factors for the Indian Stock Market. *Decision*, 37(3), 69-89.

[199] Srivastava, S. (2003). What is True Level of FDI Flows to India. *Economic and Political Weekly*, 38(7), 608-610.

[200] Stehrer, R., and Woerz, J. (2009). Attract FDI - A Universal Golden Rule? Empirical Evidence for OECD and Selected non-OECD Countries. *European Journal of Development Research*, 21(1), 95-111.

[201] Stiglitz, J.E. (1998). The Role of International Financial Institutions in the Current Global Economy. The Rebel Within London, Wimbledon Publishing Company, 172-193.

[202] Stulz, R. M. (1999). *International Portfolio Flows and Security Markets*. NBER Conference Report Series, University of Chicago Press, Chicago and London.

[203] Sula, O., and Willett, T.D. (2006). *Reversibility of Different Types of Capital Flows to Emerging Markets*. MPRA Paper 384, University Library of Munich, Germany.

[204] Tang, C. F., Yip, C. Y., and Ozturk, I. (2014). The Determinants of Foreign Direct Investment in Malaysia: A Case for Electrical and Electronic Industry. *Economic Modelling*, 43, 287-92.

[205] Tiwari, A. K., and Mutascu, M. (2011). Economic Growth and FDI in Asia: A Panel Data Approach. *Economic Analysis and Policy*, 41(2), 173-188.

[206] Tripati, R.D., and Rudra, S. (2007). Interest Rate Signals, Stock Returns and FII Inflows: Exploring the Inter Linkages, Metamorphosis. *Journal of Management Research*, 6(1), 54-68.

[207] Tsai, P.L. (1994). Determinants of Foreign Direct Investment and Its Impact on Economic Growth. *Journal of Economic Development*, 19(1), 137-163.

[208] Tweneboah, G., and Adam, A.M. (2008). *Implications of Oil Price Shocks for Monetary Policy in Ghana: A Vector Error Correction Model*. University Library of Munich, Germany, MPRA Paper Series. 11968.

[209] Udomkerdmongkol, M., Morrissey, O., and Gorg, H. (2009). Exchange Rates and Outward Foreign Direct Investment: US FDI in Emerging Economies. *Review of Development Economics*, 13(4), 754-764.

[210] Vernon, R. (1966). International Investment and International Trade in the Product Cycle. *Quarterly Journal of Economics*, 80(2), 190-207.

[211] Vidyavathi, B., Keerti, K., and Pooja, A. (2016). A Study on macro economic indicators and their impact on exchange rates. *International Journal of Engineering and Management Studies*, 7(3), 160-169.

[212] Vita, G.D., and Kyaw, K.S. (2008). Determinants of FDI and Portfolio Flows to Developing Countries: A Panel Co-integration Analysis. European Journal of Economics. *Finance and Administrative Sciences*, 13(4), 124-132.

[213] Wang, J. (2007). Foreign Equity Trading and Emerging Market Volatility: Evidence from Indonesia and Thailand. *Journal of Development Economics*, 84(2), 798-811.

[214] Wenkai, S., and Song, M. (2009). FDI's Real Impact on Foreign Exchange Reserves: Evidence from China. *China Economist*, 1, 1-12.

[215] Wheeler, D., and Mody, A. (1992). International Investment Location Decisions. The Case of US Firms. *Journal of International Economics*, 33(1-2), 57-76.

[216] Williamson (1993). *Issues Posed by Portfolio Investment in Developing Countries*. Discussion Paper 228, Washington DC, World Bank.

[217] World Bank, Development Indicators Databases for Annual Time-Series Data (2014). Accessed on October 2014, retrieved from: http://data.worldbank.org/country/malaysia

[218] Younus, H., Amir,S., and Azeem, M. (2014). Impact of Foreign Direct Investment on Economic Growth in Pakistan. *World Journal of Economic and Finance*, 1(1), 002-005.

[219] Yousaf, M. M., Hussain, Z., and Ahmad, N. (2008). Economic Evaluation of Foreign Direct Investment in Pakistan. *Pakistan Economic and Social Review*, 46(1), 37-56.

[220] Zafar, L., Imran, M., and Ramzan, M. (2013). Foreign Direct Investment and Economic Growth: Comparative Position of Chinese and Indian Economies. *Journal of Business Studies*, 4(3), 52-61.

[221] Zhang, K.H (2001). Does Foreign Direct Investment Promote Economic Growth? Evidence from East Asia and Latin America. *Contemporary Economic Policy*, 19(2), 175-85.

[222] Zhang, Q., and Felmingham, B. (2001). The Relationship Between Inward Direct Foreign Investment and China's Provincial Export Trade. *China Economic Review*, 12(1), 82-99.

Appendix A

Tools for Time Series Analysis

A.1 Test of Stationarity

Before estimating the VAR model, the unit root tests examine the stationary properties of the variables. In this study two unit root tests, viz. Dickey Fuller (DF) and Augmented Dickey Fuller (ADF) tests have been conducted to examine the stationarity properties of the variables.

A.1.1 Dickey Fuller (DF) and Augmented Dickey Fuller (ADF) Tests

Dickey and Fuller (1979) consider three different regression equations that can be used to test the presence of a unit root:

$$\Delta Y_t = \gamma Y_{t-1} + \varepsilon_t \tag{A.1}$$

$$\Delta Y_t = \alpha_0 + \gamma Y_{t-1} + \varepsilon_t \tag{A.2}$$

$$\Delta Y_t = \alpha_0 + \gamma Y_{t-1} + \alpha_2 t + \varepsilon_t \tag{A.3}$$

In the above equations, the difference between the three regressions concerns the presence of the deterministic elements $a_0, a_2 t$. The first is a pure random walk model, the seconds adds an intercept or drift term, and the third equation includes both a drift and linear time trend. The parameter of interest in all the regression equation is

γ ; if $\gamma = 0$, the Y_t sequence contains a unit root. The test involves estimating one or more of the equations above using OLS in order to obtain the estimated value of γ and associated standard error. Comparing the resulting t-statistic with the appropriate value reported in the Dickey Fuller tables allows us to determine whether to accept or reject the null hypothesis $\gamma = 0$.

In conducting Dickey Fuller test as in Equations (A.1, A.2 and A.3), it was assumed that the error term ε_t was uncorrelated. But when the assumption of uncorrelated error term is ε_t is relaxed, Dickey and Fuller have developed another test of unit root which is known as the Augmented Dickey Fuller (ADF) test, where the lagged difference terms of the variable are included in the model to make the error term serially independent. This test is conducted by 'augmenting' the preceding three equations such as Equation (A.1, A.2 and A.3) by adding the lagged values of the independent variable ΔY_t. The ADF test may be specified as follows:

$$\Delta Y_t = \alpha_0 + \alpha_1 t + \gamma Y_{t-1} + \sum_{i=1}^{k} \beta_i Y_{t-i} + \varepsilon_t \tag{A.4}$$

Where ε_t is a pure white noise error term and where Δ is difference operator, γ and β are the parameters.

In ADF test we still test whether $\gamma = 0$ and the ADF test follows the same asymptotic distribution as the DF statistics, so the same critical values can be used. It is worth while pointing out that the appropriate static to be used depends on the deterministic components included in the regression equation. When there is no intercept and trend, we use τ statistic; with only the intercept, use the τ statistic; and with both an intercept and trend, use τ_τ statistic. The statistics labeled τ, τ and τ_τ are the appropriate statistics to be used in Equations (A.1, A.2 and A.3) respectively. The DF test forms a special case of the ADF test when the summation part in the right hand side of Equation (A.4) is detected or when $K = 0$ [Dickey Fuller (1979)]. For ADF test, the value of K is determined, based on the Akaike Information Criteria (AIC) and Schwarz Information Criteria (SIC).

One advantage of ADF is that it corrects for higher order serial correlation by adding lagged difference term on the right hand side. If the simple unit root test is valid only if the series is an $AR(1)$ process. One of the important assumptions of DF test is that error terms are uncorrelated, homoscedastic as well as identically and independently distributed (iid).

A.2 Choice of Lag Length

In order to check lag length at first, the longest plausible length or longest feasible length is chosen given degrees of freedom consideration. For example, using quarterly data, lag length 12 is chosen. Second the VAR is estimated and variance and covariance matrixes of residuals are formed. Variance and covariance matrixes of residuals from 12-lag model can be called $\sum_{12}$. Now suppose, we want determine if 8 lag is appropriate. The restriction of model from 12 to 8 lags would reduce the number of estimated parameters by $4n$ in each equation.

A.3 Selection of Variables in the System

Now, we discuss some of the important steps, which are involved in VAR estimation. To begin with, the selection of appropriate variable to be included in the model is very important. There is no specific method for selection of the variable. The choice is purely based on the underlying economic theory. Testing the Stationarity of the variables is the next step. In time series literature, unit root tests are used to check whether a variable or series included in the model is stationary or not. For the VAR estimation, it is essential that all the variables included in the system should be stationary either at level or at first differences.

The last and vital step of VAR estimation is the selection of appropriate lag length of each variable in the system. The selection of the appropriate lag length is the biggest practical challenge in VAR modeling. It may be possible to use different lag length for each variable in the equation. Such type of VAR is called as NEAR VAR and can be estimated through seemingly unrelated regression (SUR). But for the sake of simplicity the same lag length is used for all equations. Various lag selection criteria are used to select the optimum lag length of the model. These are Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike Information Criteria (AIC), Schwarz Information Criteria (SIC) and Hannan-Quinn information criteria (HQ). Having set the lag length, the final step is to estimate the model.

The model is estimated through ordinary least squires (OLS). The most important thing is that the individual coefficients in estimated VAR models are often difficult to interpret directly. To overcome this problem, we use innovation accounting techniques, which include impulse response function and variance decomposition. The variables to be included in the VAR are selected according to the relevant economic model. Otherwise no explicit attempt is made to 'pare down' the number of parameters estimates. Suppose a multivariate VAR is given as follows:

$$X_t = A_0 + A_1 X_{t-1} + A_1 X_{t-2} + ... + A_p X_{t-p} + e_t \tag{A.5}$$

Where,
X_t = the $(n \times 1)$ vector containing each of the n variables included in the VAR
A_0 = an $(n \times 1)$ vector of intercept terms.
A_i = an $(n \times n)$ matrix of coefficient.
e_t = an $(n \times 1)$ vector of error terms.

In the above example, matrix A_0 contains n intercept term and each matrix A_i contains n^2 coefficients, hence $n + pn^2$ terms need to be estimated. Unquestionably, a VAR will be over parameterized by which many of these coefficient estimates can be properly exclude.

A.4 ARDL Co-integration

The study adopts an Auto-Regressive Distributed Lag (ARDL) bounds testing approach developed by Pesaran et al (2001) to model the long run determinants. This approach has some econometric advantages over the Engle-Granger (1987) and maximum likelihood-based approach proposed by Johansen and Juselius (1990), and Johansen (1991) cointegration techniques. First, the bounds test does not require pre-testing of the series to determine their order of integration since the test can be conducted regardless of whether they are purely I(1), purely I(0), or fractionally integrated. Second, endogeneity problems and inability to test hypotheses on the estimated coefficients in the long-run associated with the Engle-Granger (1987) method are avoided. According to Pesaran and Shin (1999), modeling the ARDL with the appropriate lags will correct for both serial correlation and endogeneity problems. Jalil et al (2008) argues that endogeneity is less of a problem if the estimated ARDL model is free of serial correlation. In this approach, all the variables are assumed to be endogenous and the long run and short run parameters of the model are estimated simultaneously (Khan et al, 2005). Third, as argued in Narayan (2004), the small sample properties of the bounds testing approach are far superior to that of multivariate cointegration (Halicioglu, 2007). The approach, therefore, modifies the Auto-Regressive Distributed Lag (ARDL) framework while overcoming the inadequacies associated with the presence of a mixture of I(0) and I(1) regressors in a Johansen-type framework. Fourth, the long and short-run parameters of the model in question are estimated simultaneously. Lastly, The ARDL has superior small sample properties compared to the Johansen and Juselius (1990) cointegration test (Pesaran and Shin, 1999). The procedure will, however crash in the presence of I(2) series.

Following Pesaran et al. (2001) as summarized in Choong et al. (2005), we apply the bounds test procedure by modelling the long-run equation as a general vector autoregressive (VAR) model of order p, in t Z_t :

$$Z_t = c_0 + \beta_t + \Sigma_{t-i}^{p}\Phi_i Z_{t-i} + \varepsilon_t, t = 1, 2, 3, ...T \tag{A.6}$$

With c_0 representing a $(k+1)$-vector of intercepts (drift), and β denoting a $(k+1)$-vector of trend coefficients. Pesaran et al. (2001) further derived the following vector equilibrium correction model (VECM) corresponding to equation (A.6).

$$Z_t = c_0 + \beta_t + \Pi_{z_{t-1}}\Sigma_{i=1}^{p}\Gamma_i \Delta Zt - i + \varepsilon_t, t = 1, 2, 3, ...T \tag{A.7}$$

Where the $(k+1) \times (k+1)$-matrices $\Pi = I_{K+1} + \Sigma_{i=1}^{p}\Psi_i$ and $\Gamma_i = -\Sigma_{j=i+1}^{p}\Psi j, i = 1, 2, 3.....p-1$ contain the long-run multipliers and short-run dynamic coefficients of the VECM. Z_t is the vector of variables y_t and x_t respectively. y_t is an I(1) dependent variable defined as lnY_t and $x_t = [y_{it}, i = 1, 2, 3..., T]$ is a vector matrix of 'forcing' I(0) and I(1) regressors as already defined with a multivariate identically and independently distributed (i.i.d) zero mean error vector $\varepsilon_t = (\varepsilon_{1t}, \varepsilon_{2t}^{'})'$, and a homoskedastic process. Further, assuming that a unique long-run relationship exists among the variables, the conditional VECM (equation (A.7)) now becomes

$$Y_t = c_{y0} + \beta_t + \delta_{yy}y_{t-1} + \delta_{xx}x_{t-1} + \Sigma_{i=1}^{p-1}\lambda_i \Delta y_{t-i} + \Sigma_{i=0}^{p-1}\xi_i \Delta x_{t-1} + \varepsilon_{yt}, t = 1, 2, 3, ...T \tag{A.8}$$

Where δ_i are the long run multipliers, c_0 is the drift, and ε_t are white noise errors.

A.4.1 Bounds Testing Procedure

The implementation of the ARDL approach involves two stages. First, the existence of the long-run nexus (cointegration) between the variables under investigation is tested by computing the F-statistics for analyzing the joint significance of the coefficients of the lagged levels of the variables. Pesaran and shin, 1999 and Narayan, 2004 have provided two sets of appropriate critical values for different numbers of regressors (variables). This model contains an intercept or trend or both. One set assumes that all the variables in the ARDL model are I(0), and another assumes that all the variables are I(1). If the F-statistic lies above the upper-bound critical value for a given significance level, the conclusion is that there is a non-spurious long-run level relationship with the dependent variable. If the F-statistic lies below the lower bound critical value, the conclusion is that there is no long-run level relationship with the dependent variable. If it lies between the lower and the upper limits, the result is inconclusive. The approximate critical values for the F-test were obtained from Pesaran and Pesaran (1997). The general form of the null and alternative hypotheses for the F-statistic test is as follows:
$H_0 : \delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = 0$; Against the alternative
$H_1 : \delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq \delta_5 \neq 0$

Secondly, if the cointegration between variables is identified, then one can undertake further analysis of long-run and short-run (error correction) relationship between the variables.

A.5 Stability Test

A.5.1 CUSUM Test

The CUSUM test (Brown, Durbin, and Evans, 1975) is based on the cumulative sum of the recursive residuals. This option plots the cumulative sum together with the 5% critical lines. The test finds parameter instability if the cumulative sum goes outside the area between the two critical lines. The CUSUM test is based on the statistic:

$$W_t = \sum_{r=k+1}^{t} W_r/S\,, \qquad t = K + 1.....,T \tag{A.9}$$

Where w is the recursive residual defined above, and s is the standard error of the regression fitted to all T sample points. If the b vector remains constant from period to period, $E[W_t] = 0$, but if β changes, W_t will tend to diverge from the zero mean value line. The significance of any departure from the zero line is assessed by reference to a pair of 5% significance lines, the distance between which increases with t. The 5% significance lines are found by connecting the points.

$$[k, \pm 0.948(T-k)^{1/2} \text{ and } [T, \pm 3 \times 0.948(T-k)^{1/2}]$$

Movement of W_t outside the critical lines is suggestive of coefficient instability.

A.6 VECM based Granger Causality

The Granger representation theorem suggests that there will be Granger causality in at least one direction if there exists a cointegration relationship among the variables, providing that they are integrated order of one. The direction of causality is investigated by applying Vector Error Correction Model (VECM) granger causality approach only after confirming the presence of co-integrating relationship among the variables in the study. Granger (1969) argued that VECM is more appropriate to examine the causality between the series at I(1). VECM is restricted form of unrestricted VAR and restriction is levied on the presence of the long run relationship between the series. The system of error correction model (ECM) uses all the series endogenously. This system allows the predicted values to explain itself both by its own lags and lags of forcing variables as well as the lags of the error correction term and by residual term. Engle and Granger (1987) caution that the Granger causality test, which is conducted in the first differences variables by means of a vector autoregression (VAR), will be misleading in the presence of co-integration. Therefore, an inclusion of an additional variable to the VAR system, such as the error correction term would help us to capture the long run relationship. To this end, an augmented form of the Granger causality test involving the error correction term is formulated in a multivariate p^{th} order vector error correction model. The VECM equation is as follows:

$$\begin{pmatrix} \Delta x_{1t} \\ \Delta y_{1t} \\ \Delta y_{2t} \\ \Delta y_{3t} \\ \cdots \\ \Delta y_{nt} \end{pmatrix} = \begin{pmatrix} C_{1t} \\ C_{2t} \\ C_{3t} \\ C_{4t} \\ \cdots \\ C_{nt} \end{pmatrix} + \sum_{i=1}^{p} \begin{bmatrix} \beta_{11i} & \beta_{12i} & \beta_{13i} & \beta_{14i} & \dots & \beta_{1ni} \\ \beta_{21i} & \beta_{22i} & \beta_{23i} & \beta_{24i} & \dots & \beta_{2ni} \\ \beta_{31i} & \beta_{32i} & \beta_{33i} & \beta_{34i} & \dots & \beta_{3ni} \\ \beta_{41i} & \beta_{42i} & \beta_{43i} & \beta_{44i} & \dots & \beta_{4ni} \\ \vdots & \vdots & \vdots & \vdots & \dots & \vdots \\ \beta_{n1i} & \beta_{n2i} & \beta_{n3i} & \beta_{n4i} & \dots & \beta_{nni} \end{bmatrix} \begin{pmatrix} \Delta x_{1_{t-i}} \\ \Delta y_{1_{t-i}} \\ \Delta y_{2_{t-i}} \\ \Delta y_{3_{t-i}} \\ \cdots \\ \Delta y_{n_{t-i}} \end{pmatrix} + \begin{pmatrix} \gamma_{1t} \\ \gamma_{2t} \\ \gamma_{3t} \\ \gamma_{4t} \\ \cdots \\ \gamma_{nt} \end{pmatrix} ECM_{t-1} + \begin{pmatrix} \varepsilon_{1t} \\ \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \\ \cdots \\ \varepsilon_{nt} \end{pmatrix} \tag{A.10}$$

The C's, β's and γ's are the parameters to be estimated. ECM $t-1$ represents the one period lagged error-term derived from the co-integration vector and the ε's are serially independent with mean zero and finite covariance matrix. From the Equation *** given the use of a VAR structure, all variables are treated as endogenous variables. The F test is applied here to examine the direction of any causal relationship between the variables. The coefficients on the ECM represent how fast deviations from the long-run equilibrium are eliminated. Another channel of causality can be studied by testing the significance of ECM's. This test is referred to as the long run causality test.

A.7 Impulse Response Function

The Impulse Response Function (IRF) is one of the essential tools for interpreting VAR model results. The IRF allows researchers to examine the current and future behavior of a variable that following a shock to another variable within the system. The IRF is a useful tool for determining the magnitude, direction, and the length of time that the variables in the system are affected by a shock to another variable. To estimate IRFs, some practical issues need to be considered. The VAR model needs to be transformed into the vector moving average (VMA) representation. Enders (2010) advocate that this transformation is an essential feature of Sims's (1980) methodology since it allows for tracing out the effects of various shocks on variables contained in the VAR system. In the case of a VAR model with two variables included, the form of the IRFs can be written as shown in Enders (2004):

$$\left[\frac{Y_t}{Z_t}\right] = \left[\frac{\bar{Y}}{\bar{Z}}\right] + \sum_{i=0}^{\infty} \frac{A^i}{1 - b_{12}b_{21}} \begin{bmatrix} 1 & -b12 \\ -b_{21} & 1 \end{bmatrix} \begin{bmatrix} \varepsilon_{Y_{t-i}} \\ \varepsilon_{Z_{t-i}} \end{bmatrix} \tag{A.11}$$

$$\left[\frac{Y_t}{Z_t}\right] = \left[\frac{\bar{Y}}{\bar{Z}}\right] + \sum_{i=0}^{\infty} \begin{bmatrix} \theta_{11}^i & \theta_{12}^i \\ \theta_{21}^i & \theta_{22}^i \end{bmatrix} \begin{bmatrix} \varepsilon_{Y_{t-i}} \\ \varepsilon_{Z_{t-i}} \end{bmatrix} \tag{A.12}$$

And;

$$X_t = \mu + \sum_{i=0}^{\infty} \theta_i \varepsilon_{t-i} \tag{A.13}$$

Where θ_i is the IRFs of disturbances. Therefore, the IRF is found by reading off the coefficients in the moving average representation of the process. If the innovations $\varepsilon_{t\text{âĹŠ}i}$ are contemporaneously uncorrelated, the interpretation of the impulse response is straightforward. For example, the i^{th} innovation of ε_t is simply a shock to the i^{th} endogenous variable in the system Enders (2004).

However, the residuals generated by the VAR models are usually contemporaneously correlated. This is because in a VAR model only lagged endogenous variables are admitted on the right-hand side of each equation (in addition to a constant term), and hence all the contemporaneous shocks which impact on X_t are forced to feed through the residuals, u_{it} (Kuszczak and Murray, 1986). While this may not cause a problem in the estimation of the VAR model, the impulse responses and variance decompositions derived from the initial estimates of the VAR model could be affected such that any adjustment to the order in which the variables are entered in the system could produce different results (Kuszczak and Murray, 1986). Thus, there is a need to impose some restrictions when estimating the VAR model to identify the IRFs. In this regard, a common approach is the Cholesky decomposition, which was originally applied by Sims (1980). The Cholesky decomposition overcomes the problem of contemporaneous relationships among the innovations error terms within the estimated VAR model by identifying the structural shocks such that the covariance matrix of the estimated residuals is lower triangular. In fact, the Cholesky decomposition suggests that there is no contemporaneous pass-through from Y_t to the other variable, z_t. More formally, in the VAR, the matrix error structure becomes left triangular, $\begin{bmatrix} \frac{e_{1t}}{e_{2t}} \end{bmatrix} = \begin{bmatrix} 1 & -b_{12} \\ 0 & 1 \end{bmatrix} \begin{bmatrix} \varepsilon_{Y_t} \\ \varepsilon_{Z_t} \end{bmatrix}$. In practice, this means that the Cholesky decomposition attributes all the effect to the variable that comes first to the target variable in the VAR system.

A.8 Variance Decomposition Technique

For any variable, short run variations are due to its own shocks, but over time other shocks contribute to these changes as well. Forecast error variance decomposition

(FEVD) is a method available to examine this interesting phenomenon. In fact, while the IRFs analyze the dynamic behavior of the target variables due to unanticipated shocks within a VAR model, variance decompositions determine the relative importance of each innovation to the variables in the system. That is, variance decompositions can be considered similar to R^2 values associated with the dependent variables in different horizons of shocks. Enders (2010) show how to write FEVD to conditionally calculate n-period forecast error X_{t+n} considering the VMA representation of VAR presented in Equation (A.14) as:

$$X_{t+n} - E_t X_{t+n} = \mu + \sum_{i=0}^{n-1} \theta_i \varepsilon_{t+n-1} \tag{A.14}$$

Considering Y_t, the first element of the X_{t+n} matrix in Equation (A.15), the variance of the n-step-ahead forecast error can be calculated as:

$$\begin{aligned} Y_{t+n} - E_t X_{t+n} = \theta_{11}(0)\varepsilon_{yt+n} + \theta_{11}(1)\varepsilon_{yt+n-1} + ... + \theta_{11}(n-1)\varepsilon_{yt+1} \\ + \theta_{12}(0)\varepsilon_{zt+n} + \theta_{12}(1)\varepsilon_{zt+n-1} + ... + \theta_{12}(n-1)\varepsilon_{zt+1} \end{aligned} \tag{A.15}$$

or

$$\begin{aligned} \sigma_y(n)^2 = \sigma_y^2[\theta_{11}(0)^2 + \theta_{11}(1)^2 + ... + \theta_{11}(n-1)^2] \\ + \sigma_z^2[\theta_{12}(0)^2 + \theta_{12}(1)^2 + ... + \theta_{12}(n-1)^2] \end{aligned} \tag{A.16}$$

Where $\sigma_y(n)^2$ and $\sigma_z(n)^2$ denote the n-step-ahead forecast error variance of Y_{t+n} and Z_{t+n}, respectively. The first part of the Equation (A.16) shows the proportion of variance due to the variables own shock, Y_t, while the second part of the Equation (A.16) shows the proportion of variance due to the other variables shock, Z_t. Theoretically, the first part decreases over time while the second part of the variance increases. However, it is typical for a variable to explain almost all of its forecast error variance at a short horizon and smaller proportions at longer horizons (Enders, 2010). From this standpoint VDC is useful to assess the Granger causal relationships among variables when the variance decomposition results imply that one variable explains a high portion of the forecast error variance of another variable. That is, when a shock ε_z explains none of the forecast error variance of the sequence Y_t at all forecast horizons, i.e., $\frac{\delta\sigma_y^2}{\sigma_z^2} \approx 0$, we may say that Y_t evolves indecently of the Z_t shocks, ε_z. Also, when a shock to the Z_t sequence, ε_z, explains the entire forecast error variance of the sequence the Y_t at all forecast horizons, i.e., $\frac{\delta\sigma_y^2}{\sigma_z^2} \approx 100\%$, may say that Y_t sequence is totally endogenous (Enders, 2010).

A.9 Granger Causality Test

The short run dynamic relationship between the capital flows and economic growth may be examined by using the concept of Granger's (1969) causality test. Granger's causality [proposed by Granger (1969) and popularized by Sims (1972)] may be defined as the forecasting relationship between two variables. In short, Granger causality test states that if S & E are two time series variables and, if past values of a variable S significantly contribute to forecast the value of the other variable E, then S is said to be Granger causing E and vice versa. The test involves the following two regression equations:

$$S_t = \gamma_0 + \sum_{i=1}^{n} \alpha_i E_{t-i} + \sum_{j=1}^{n} \beta_j S_{t-j} + u_{1t} \tag{A.17}$$

$$E_t = \gamma_1 + \sum_{i=1}^{m} \lambda_i X_{t-i} + \sum_{j=1}^{m} \delta_j E_{t-j} + u_{2t} \tag{A.18}$$

Where, S_t and E_t are the are capital inflows and economic growth to be tested, and u_{1t} and u_{2t} are mutually uncorrelated white noise errors, and t denotes the time period. Equation (A.17) postulates that current S is related to past values of S as well as of past E. Similarly, Equation (A.18) postulates that E is related to past values of E as well as related to past values of S. Three possible conclusions can be adduced from such analysis viz, unidirectional causality, bi-directional causality and that they are independent of each other.

1. Unidirectional causality from E to S is indicated if the estimated coefficients on the lagged E in Equation (A.17) are statistically different from zero as a group (i.e., $\sum_{i=1}^{n} \alpha_i \neq 0$) and set of estimated coefficients on the lagged E in Equation (A.18) is not statistically different from zero (i.e., $\sum_{j=1}^{n} \delta_j = 0$).

2. Unidirectional causality from S to E exists if the set of lagged E coefficients in Equation (A.17) is not statistically different from zero (i.e., $\sum_{i=1}^{n} \alpha_i = 0$) and the set of the lagged S coefficients in Equation (A.18) is statistically different from zero (i.e., $\sum_{j=1}^{n} \delta_j \neq 0$).

3. Feedback or bilateral causality is suggested when the sets of E and S coefficients are statistically and significantly different from zero in both regression.

4. Finally, independence is suggested when the sets of E and S coefficients are not statistically significant in both regressions.

There are two important steps involved with the Granger's causality test. First, stationary data is required for Equation (A.17) and (A.18). Second, in addition to the need for testing the stationary property of the data, the Granger methodology somewhat sensitive to the lag ength used in Equations (A.17) and (A.18). It is better to use more rather than fewer lag length since the theory is couched in terms of the relevant past information. The chosen lag length must be matched with the actual lag length. If it is lesser than actual lag length, the omission of relevant lags can be cause bias and if it is more than the relevant lag length causes the equations to be insufficient. To deal with this problem, it developed a systematic autoregressive method for choosing appropriate lag length. Therefore, the appropriate lag length is one where Akaike's Final Prediction Error (FPE) is lowest. Akaike Information Criteria (AIC), or Schwarz Information Criteria (SIC), or Likelihood Ratio (LR) Criterion or Hannan-Quinn information Criterion (HQIC) is also useful for choosing the lag length.

A.9.1 GARCH (p,q) Model

The GARCH model can be extended to a GARCH (p, q) model in which p is the lagged term of the squared error term and q is lagged conditional variance. This may be represented as;

$$h_t = \alpha_0 + \alpha_1 u_{t-1}^2 + \alpha_2 u_{t-2}^2 + ... + \alpha_q u_{t-q}^2 + \beta_1 \sigma_{t-1}^2 + \beta_2 \sigma_{t-2}^2 + ... + \beta_p \sigma_{t-p}^2 \quad \text{(A.19)}$$

$$h_t = \alpha_0 + \sum_{i=1}^{q} \alpha_i u_{t-i}^2 + \sum_{j=1}^{p} \beta_j \sigma_{t-j}^2 \quad \text{(A.20)}$$

Where, $\alpha > 0$, $\alpha_i \geq 0$, $\beta_j \geq 0$

In both ARCH and GARCH models, restrictions are to be placed on the parameters to keep the conditional volatility positive. This also implies that any shock is always an indication of increase in conditional volatility forever. In order to check the presence of ARCH effects on the data, we have applied Lagrange Multiplier (LM) tests.

Appendix B

Policy Framework of Foreign Investment

Table B.1: FDI Limits in India

Sector	Limit	Entry Route
Agriculture & Animal Husbandry	100%	Automatic
Plantation Sector (Tea,Coffee,Rubber, Cardamom, Palm oil, Olive oil)	100%	Automatic
Mining	100%	Automatic
Petroleum & Natural Gas (Petroleum refining by the Public Sector Undertakings (PSU))	49%	Automatic
Petroleum & Natural Gas (All other activity)	100%	Automatic
Defence	100%	Automatic upto 49% Above 49% under Government route on case to case basis
Broadcasting Carriage Services	100%	Automatic upto 49% Government route beyond 49%

Broadcasting Content Services	49%	Government
Print Media [Publishing of newspaper and periodicals dealing with news and current affairs][Publication of Indian editions of foreign magazines dealing with news and current affairs]	26%	Government
Print Media [Publishing/printing of scientific and technical magazines/specialty journals/ periodical] [Publication of facsimile edition of foreign newspapers]	100%	Government
Civil Aviation	100%	Automatic
Airports[Greenfield projects]	100%	Automatic
Airports[Existing projects]	100%	Automatic up to 74% Government route beyond 74%
Construction Development	100%	Automatic
Industrial Parks	100%	Automatic
Satellites- establishment and operation	100%	Automatic
Private Security Agencies	74%	Automatic
Telecom Services	100%	Automatic up to 49% Government route beyond 49%
Trading[Cash & Carry Wholesale Trading/Wholesale Trading (including sourcing from MSEs)]	100%	Automatic
E-commerce activities	100%	Automatic
Single Brand product retail trading	100%	Automatic up to 49% Government route beyond 49%

Multi Brand Retail Trading	51%	Government
Processed Food Products	100%	Automatic
Duty Free Shops	100%	Automatic
Railway Infrastructure	100%	Automatic
Asset Reconstruction Companies	100%	Automatic
Banking- Private Sector	74%	Automatic up to 49% Government route beyond 49% and up to 74%.
Banking- Public Sector	20%	Government
Credit Information Companies (CIC)	100%	Automatic
Infrastructure Company in the Securities Market [in compliance with SEBI Regulations]	49%	Automatic
Insurance	49%	Automatic
Pension Sector	49%	Automatic
Power Exchanges	49%	Automatic
White Label ATM Operations	100%	Automatic
Non-Banking Finance Companies (NBFC)	100%	Automatic
Pharmaceuticals[Greenfield]	100%	Automatic
Pharmaceuticals[Brownfield]	100%	Government
Railway Infrastructure	100%	Automatic
Regulated Financial Services	100%	Automatic

Table B.2: FIIs Policy Changes

Date	Policy Changes
September 1992	FIIs allowed investing by the Government Guidelines in all securities in both primary and secondary markets and schemes floated by mutual funds. Single FIIs to invest 5 percent and all FIIs allowed investing 24 percent of a company's issued capital. Broad based funds to have 50 investors with no one holding more than 5 percent. The objective was to have reputed foreign investors, such as, pension funds, mutual fund or investment trustsand other broad based institutional investors in the capital market.
April 1997	Aggregated limit for all FIIs increased to 30 per cent subject to special procedure and resolution. The objective was to increase the participation by FIIs.
April 1998	FIIs permitted to invest in dated Government securities subject to a ceiling. Consistent with the Government policy to limit the short-term debt, a ceiling of US $1 billion was assigned which was increased to US $1.75 billion in 2004.
June 1998	Aggregate portfolio investment limit of FIIs and NRIs/PIOs/OCBs enhanced from 5 per cent to10 per cent and the ceilings made mutually exclusive. Common ceilings would have negated the permission to FIIs. Therefore, separate ceilings were prescribed.
June 1998	Forward cover allowed in equity.
February 2000	Foreign firms and high net-worth individuals permitted to invest as sub-accounts of FIIs. Domestic portfolio manager allowed to be registered as FIIs to manage the funds of subaccounts. The objective was to allow operational flexibility and also give access to domestic asset management capability.
March 2001	FII ceiling under special procedure enhanced to 49 percent. The objective was to increase FII participation.
September 2001	FII ceiling under special procedure raised to sectoral cap.
December 2003	FII dual approval process of SEBI and RBI changed to single approval process of SEBI. The objective was to streamline the registration process and reduce the time taken for registration.

November2004	Outstanding corporate debt limit of USD 0.5 billion prescribed. The objective was to limit short term debt flows.
April 2006	Outstanding corporate debt limit increased to USD 1.5 billion prescribed. The limit on investment in Government securities was enhancedto USD 2 bn. This was an announcement in the Budget of 2006-07.
November 2006	FII investment up to 23% permitted in infrastructure companies in the securities markets, viz. stock exchanges, depositories and clearing corporations. This is a decision taken by Government following the mandating of demutualization and corporatization of stock exchanges.
January and October, 2007	FIIs allowed to invest USD 3.2 billion in Government Securities (limits were raised from USD 2 billion in two phases of USD 0.6 billion each in January and October).
June 2008	While reviewing the External Commercial Borrowing policy, the Government increased the cumulative debt investment limits from US \$3.2 billion to US \$5 billion and US \$1.5 billion to US \$3 billion for FII investments in Government Securities and Corporate Debt, respectively.
October 2008	While reviewing the External Commercial Borrowing policy, the Government increased the cumulative debt investment limits from US \$3 billion to US \$6 billion for FII investments in Corporate Debt.
October 2008	Removal of regulation for FIIs pertaining to restriction of 70:30 ratio of investment in equity and debt respectively.
October 2008	Removal of Restrictions on Overseas Derivatives Instruments (ODIs) Disapproval of FIIs lending shares abroad.
March 2009	E-bids platform for FIIs
August 2009	FIIs allowed to participate in interest rate futures
April 2010	FIIs allowed offering domestic Government Securities and foreign sovereign securities with AAA rating, as collateral to the recognized stock exchanges in India, in addition to cash, for their transactions in the cash segment of the market.

November 2010	Investment cap for FIIs increased by US $5 billion each in Government securities and corporate bonds to US $10 billion and US $20 billion respectively.
March 2011	The limit of US $5 billion in corporate bonds issued by companies in the infrastructure sector with a residual maturity of over five years increased by an additional limit of US $20 billion, taking the total limit to US $25 billion
August 2011	The Non-Banking Financial Companies (NBFCs) categorised as Infrastructure Finance Companies (IFCs) by the RBI would be considered eligible issuers for the purposes of FII investment under the corporate debt long-term infra category.
January 2012	The Central Government announced its decision to allow qualified foreign investors (QFIs) to directly invest in the Indian equity market, in order to widen the class of investors, attract more foreign funds, reduce market volatility, and to deepen the Indian capital market.

June 2012	QFIs were allowed to invest in the schemes of Indian mutual funds and Indian equity shares, subject to the terms and conditions mentioned therein. Subsequently, vide the SEBI circular dated January 25, 2012, the eligibility criteria for a qualified DP were revised. Following a review by the SEBI, and in consultation with the Government of India (GoI) and the RBI, it was decided to revise the definition of a qualified foreign investor (QFI). A QFI would mean a person who fulfils the following criteria: 1. The person is resident in a country that is a member of the Financial Action Task Force (FATF) or a member of a group that is a member of FATF. 2. The person is resident in a country that is a signatory to IOSCO's MMOU or a signatory of a bilateral MOU with the SEBI. 3. The person is not resident in a country listed in the public statements issued by the FATF from time to time regarding (i) jurisdictions having strategic Anti-Money Laundering/ Combating the Financing of Terrorism (AML/ CFT) deficiencies to which counter measures apply; and (ii) jurisdictions that have not made sufficient progress in addressing the deficiencies or have not committed to an action plan developed with the FATF to address the deficiencies. 4. The person is not resident in India. 5. The person is not registered with the SEBI as an FII, sub-account, or foreign venture capital investor

July 2012	SEBI has now been decided to allow QFIs to invest in Indian corporate debt securities and the debt schemes of Indian mutual funds.The QFI transactions would be limited to the following debt securities: 1. Purchase and sale of corporate debt securities listed on recognised stock exchange(s). 2. Purchase of corporate debt securities through public issues, if the listing on the recognised stock exchange(s) is committed to be done as per the extant provisions of the Companies Act, 1956. 3. Sale of corporate debt securities by way of buyback or redemption by the issuer. 4. Purchase and sale of units of the debt schemes of Indian mutual funds.
March 2013	The SEBI has allowed FIIs to offer government securities, corporate bonds, cash, and foreign sovereign securities with AAA ratings as collateral (to meet their margin requirements) for their transactions in cash segments as well as futures and options (F&O) segments. The decision follows a proposal in the Union Budget 2013-2014 that permitted FIIs to use their investments in corporate bonds and government securities as collateral. Earlier, FIIs were allowed to provide only cash and foreign sovereign securities with AAA rating as collateral in the F&O segment; in the cash segment, only foreign sovereign securities with AAA rating, government securities, and cash were permitted as collateral.

May 2014	SEBI has come out with a risk management framework for FPIs pertaining to various aspects, including margin requirements. The FPI regime brings together all foreign investor classes such as Foreign Institutional Investors (FIIs), their sub-accounts and Qualified Foreign Investors (QFIs). All trades undertaken by FPIs in the cash market would be margined on a 'T+1' basis, which means settlement of trades with all the required payments one day after the execution of the trade order. However, the trades of FPIs who are corporate bodies, individuals or family offices would be margined on an upfront basis as per the extant margining framework for the non-institutional trades.
June 2014	SEBI has allowed eligible Foreign Portfolio Investors (FPIs) to trade in the currency derivatives segment of stock exchanges to facilitate hedging their currency risk emanating from their exposure to the Indian debt and equity markets
September 2014	In order to enhance the hedging facilities for the FPIs holding securities under the Portfolio Investment Scheme (PIS), RBI has permitted the FPIs to hedge the coupon receipts arising out of their investments in debt securities in India which are due in the next 12 months subject to the condition that the hedge contracts shall not be eligible for rebooking on cancellation. The contracts can however be rolled over on maturity provided the relative coupon amount is yet to be received.
August 2015	As per the agreement between India and U.S. to improve international tax compliance and to implement the Foreign Account Tax Compliance Act (FATCA) in India, foreign financial institutions operating in India will now be required to report tax information about U.S. account holders/ taxpayers directly to the Indian Government and the Indian government shall pass this information to the U.S. Internal Revenue Service (IRS).

December 2015	SEBI has decided to align the applicable eligibility and investment norms between Foreign Portfolio Investor (FPI) regime and subscription through the Offshore Derivative Instruments (ODI) route. A FPI shall issue ODIs only to those subscribers which meet the eligibility criteria as follows: a. The applicant is resident of a country whose securities market regulator is a signatory to International Organization of Securities Commission's Multilateral Memorandum of Understanding. b. The applicant being a bank, is a resident of a country whose central bank is a member of Bank for International Settlements; c. The applicant is not resident in a country identified in the public statement of Financial Action Task Force.
March 2016	RBI has amended the Foreign Exchange Management Regulations 2015 to allow FPIs to invest in REITs, InvITs and AIFs. These investments by FPIs will be subject to SEBI (FPI) Regulations, 2014.RBI has also allowed FPIs to acquire bonds under default, either fully of partly in repayment of principle on maturity or principal instalment in the case of amortising bond. Such bonds shall have a minimum maturity period of three years.
June 2016	With a view to bring about uniformity and to increase the transparency in the systems and procedures adopted by the ODI issuers to comply with regulatory conditions, SEBI has revised the KYC (Know Your Client) norms for offshore derivative instruments (ODI) subscription by foreign portfolio investors and modified ODI reporting format.

September 2017	Investments by FPIs in corporate debt securities. It has been decided to permit FPIs to invest inthe following: Unlisted corporate debt securities in the form of non-convertible debentures/bonds issued by public or private Indian companies subject to the guidelines issued by the Ministry of Corporate Affairs, Government of India from time to time and also subject to minimum residual maturity of three years and end use-restriction on investment in real estate business, capital market and purchase of land. The expression 'Real Estate Business' shall have the same meaning as assigned to it in Foreign Exchange Management (Transfer or issue of Security by a Person Resident outside India) Regulations, 2000 Notification No.FEMA.362/2016-RB dated February 15, 2016. The custodians of the FPIs should put in place an appropriate mechanism to ensure compliance with these conditions as prescribed by RBI from time to time. Securitised debt instruments as under any certificate or instrument issued by a special purpose vehicle (SPV) set up for securitisation of asset/s where banks, FIs or NBFCs are originators; and/or any certificate or instrument issued and listed in terms of the SEBI (Public Offer and Listing of Securitised Debt Instruments) Regulations, 2008. Investment by FPIs in the unlisted corporate debt securities and securitised debt instruments should not exceed INR 35,000 cr. within the extant corporate debt limit which currently is INR 2,44,323 cr. Further, investment by FPIs in securitised debt instruments should not be subject to the minimum 3-year residual maturity requirement

November 2017	FPIs are permitted to invest in REITs and InvITs, which are classified as hybrid securities and presently, the said investments are not reflected in the daily FPI net investment data or the monthly/fortnightly FPI AUC data. In order to capture FPI investment data in hybrid securities, a third category termed as ”Hybrid Security” shall be created for the purpose of capturing and disseminating FPI investment data in hybrid securities. The depositories (NSDL and CDSL) shall put in place the necessary systems for the daily reporting by the custodians of the FPIs and shall also disseminate on their websites, the AUC of the FPIs in debt, equity and hybrid securities.

Appendix C

Evaluation Results of VECM Model

Table C.1: Correlation Matrix of Foreign Investment and Foreign Exchange Reserves

	FER	**FDI**	**FPI**
FER	1.000000	0.807032	0.142957
FDI	0.807032	1.000000	0.049163
FPI	0.142957	0.049163	1.000000

Table C.2: Vector Error Correction Estimates for Foreign Investment and Foreign Exchange Reserves

Vector Error Correction Estimates		
Standard errors in ( ) & t-statistics in [ ]		
Cointegrating Eq:	**CointEq1**	**CointEq2**
FER(-1)	1.000000	0.000000
LFDI(-1)	0.000000	1.000000
LFPI(-1)	2730943.	25.20138
	(454992.)	(3.68117)
	[6.00218]	[6.84602]
	-269054.8	-3.246295
	(246483.)	(1.99420)

LREER(-1)		
	[-1.09158]	[-1.62787]
EXP(-1)	145.8983	0.001260
	(27.5737)	(0.00022)
	[5.29121]	[5.64924]
IMP(-1)	-106.9119	-0.000933
	(17.9426)	(0.00015)
	[-5.95855]	[-6.43051]
C	-25853484	-239.7477

Error Correction:	**D(FER)**	**D(LFDI)**	**D(LFPI)**	**D(LREER)**	**D(EXP)**	**D(IMP)**
CointEq1	-2.26E-05	4.68E-06	7.95E-08	-7.42E-08	0.000530	0.002101
	(0.00589)	(7.3E-07)	(1.8E-07)	(3.9E-08)	(0.00180)	(0.00275)
	[-0.00384]	[6.40059]	[0.43336]	[-1.88102]	[0.29474]	[0.76316]
CointEq2	395.2494	-0.537972	-0.019678	0.010503	-126.9614	-90.89389
	(671.089)	(0.08344)	(0.02093)	(0.00450)	(204.856)	(313.974)
	[0.58897]	[-6.44755]	[-0.94020]	[2.33463]	[-0.61976]	[-0.28949]
D(FER(-1))	0.259438	9.49E-06	-8.26E-08	-6.81E-07	0.077916	0.067065
	(0.07239)	(9.0E-06)	(2.3E-06)	(4.9E-07)	(0.02210)	(0.03387)
	[3.58376]	[1.05393]	[-0.03659]	[-1.40387]	[3.52586]	[1.98009]
D(FER(-2))	0.116527	5.22E-06	1.18E-06	-3.90E-07	0.015039	0.029372
	(0.07347)	(9.1E-06)	(2.3E-06)	(4.9E-07)	(0.02243)	(0.03437)
	[1.58612]	[0.57105]	[0.51330]	[-0.79212]	[0.67059]	[0.85453]
D(LFDI(-1))	-1040.208	-0.22326	0.014751	-0.007333	24.47674	-204.8956
	(634.630)	(0.07891)	(0.01979)	(0.00425)	(193.727)	(296.916)
	[-1.63908]	[-2.82947]	[0.74526]	[-1.72368]	[0.12635]	[-0.69008]
D(LFDI(-2))	59.21863	-0.078545	0.000670	-0.00328	73.88292	91.03855
	(526.953)	(0.06552)	(0.01643)	(0.00353)	(160.857)	(246.539)
	[0.11238]	[-1.19884]	[0.04077]	[-0.92849]	[0.45931]	[0.36927]
D(LFPI(-1))	-6731.505	0.453495	-0.366282	-0.033896	723.3542	-2760.421
	(3091.92)	(0.38443)	(0.09643)	(0.02073)	(943.837)	(1446.58)
	[-2.17713]	[1.17967]	[-3.79843]	[-1.63534]	[0.76640]	[-1.90824]
D(LFPI(-2))	-5456.309	0.221112	-0.304202	-0.013015	276.3952	-3248.383
	(2243.94)	(0.27899)	(0.06998)	(0.01504)	(684.984)	(1049.84)
	[-2.43157]	[0.79253]	[-4.34678]	[-0.86522]	[0.40351]	[-3.09416]

D(LREER(-1))	12909.77	0.184542	0.175559	0.033136	-2889.038	-2679.302
	(9757.61)	(1.21319)	(0.30432)	(0.06541)	(2978.60)	(4565.17)
	[1.32305]	[0.15211]	[0.57690]	[0.50657]	[-0.96993]	[-0.58690]
D(LREER(-2))	-8591.928	2.868278	-0.158069	-0.027461	-430.989	-2803.243
	(9708.96)	(1.20714)	(0.30280)	(0.06509)	(2963.75)	(4542.41)
	[-0.88495]	[2.37609]	[-0.52202]	[-0.42192]	[-0.14542]	[-0.61713]
D(EXP(-1))	0.443199	1.67E-05	2.49E-05	1.55E-07	-0.547785	-0.114341
	(0.24167)	(3.0E-05)	(7.5E-06)	(1.6E-06)	(0.07377)	(0.11307)
	[1.83393]	[0.55429]	[3.30120]	[0.09594]	[-7.42550]	[-1.01128]
D(EXP(-2))	-0.098154	5.84E-06	1.55E-05	1.40E-06	-0.317254	0.165862
	(0.22541)	(2.8E-05)	(7.0E-06)	(1.5E-06)	(0.06881)	(0.10546)
	[-0.43546]	[0.20825]	[2.19931]	[0.92741]	[-4.61076]	[1.57278]
D(IMP(-1))	-0.177882	-1.92E-07	-1.82E-05	2.88E-07	-0.096935	-0.303827
	(0.16623)	(2.1E-05)	(5.2E-06)	(1.1E-06)	(0.05074)	(0.07777)
	[-1.07009]	[-0.00930]	[-3.50612]	[0.25841]	[-1.91028]	[-3.90661]
D(IMP(-2))	-0.211053	-5.83E-06	-6.19E-06	4.09E-07	0.082025	0.024028
	(0.14985)	(1.9E-05)	(4.7E-06)	(1.0E-06)	(0.04574)	(0.07011)
	[-1.40843]	[-0.31274]	[-1.32411]	[0.40758]	[1.79316]	[0.34272]
C	873.0460	-0.003965	0.002786	0.000810	5.031923	15.82713
	(277.864)	(0.03455)	(0.00867)	(0.00186)	(84.8204)	(130.001)
	[3.14199]	[-0.11476]	[0.32146]	[0.43483]	[0.05932]	[0.12175]
R-squared	0.304986	0.380472	0.344361	0.054384	0.374065	0.279888
Adj. R-squared	0.264611	0.344483	0.306274	-0.000548	0.337704	0.238056
Sum sq. resids	3.98E+09	61.48356	3.868619	0.178737	3.71E+08	8.71E+08
S.E. equation	4062.433	0.505093	0.126698	0.027233	1240.095	1900.640
F-statistic	7.553963	10.57186	9.041461	0.990024	10.28744	6.690742
Log likelihood	-2482.761	-180.6681	173.3636	566.9300	-2178.993	-2288.306
Akaike AIC	19.51376	1.528657	-1.237215	-4.311953	17.14057	17.99458

Schwarz SC	19.72148	1.736382	-1.02949	-4.104228	17.34830	18.20230
Mean dependent	1314.336	0.009623	0.004239	-0.00057	74.07344	116.5496
S.D. dependent	4737.266	0.623848	0.152116	0.027226	1523.803	2177.401
Determinant resid covariance (dof adj.)		1.49E+14		**Akaike information criterion**		50.09728
Determinant resid covariance		1.04E+14		**Schwarz criterion**		51.50981
Log likelihood		-6310.45				

Table C.3: Correlation Matrix of Foreign Investment and Wholesale Price Index

	FDI	**FPI**	**WPI**
FDI	1.000000	0.049163	0.773889
FPI	0.049163	1.000000	0.133321
WPI	0.773889	0.133321	1.000000

Table C.4: Vector Error Correction Estimate for Foreign Investment and Wholesale Price Index

Vector Error Correction Estimates		
Standard errors in ( ) & t-statistics in [ ]		
Cointegrating Eq:	**CointEq1**	**CointEq2**
WPI(-1)	1.000000	0.000000
LFDI(-1)	0.000000	1.000000
LFPI(-1)	-162.054	3.681155
	(30.1909)	(0.78515)
	[-5.36763]	[4.68846]
LCOP(-1)	12.32280	0.172228
	(7.28790)	(0.18953)
	[1.69086]	[0.90871]

NEER(-1)			1.430571		-0.04444	
			(0.30306)		(0.00788)	
			[4.72041]		[-5.63800]	
IIP(-1)			-0.44344		-0.04767	
			(0.16778)		(0.00436)	
			[-2.64304]		[-10.9251]	
C			1312.393		-34.3789	
Error Correction:	**D(WPI)**	**D(LFDI)**	**D(LFPI)**	**D(LCOP)**	**D(NEER)**	**D(IIP)**
CointEq1	-0.00403	-0.00495	0.002106	-0.00067	-0.02188	-0.00076
	(0.00324)	(0.00257)	(0.00062)	(0.00040)	(0.00819)	(0.02745)
	[-1.24636]	[-1.92594]	[3.39521]	[-1.66784]	[-2.67167]	[-0.02760]
CointEq2	-0.33146	-0.43739	-0.02732	-0.02793	0.246958	1.314214
	(0.09430)	(0.07492)	(0.01807)	(0.01174)	(0.23864)	(0.79976)
	[-3.51492]	[-5.83796]	[-1.51157]	[-2.37972]	[1.03487]	[1.64326]
D(WPI(-1))	0.440402	-0.04126	-0.01333	0.006138	-0.04172	-3.45406
	(0.06612)	(0.05253)	(0.01267)	(0.00823)	(0.16731)	(0.56072)
	[6.66111]	[-0.78548]	[-1.05154]	[0.74591]	[-0.24936]	[-6.16007]
D(WPI(-2))	0.023122	-0.00186	0.001308	-0.0112	0.075707	1.299072
	(0.06251)	(0.04966)	(0.01198)	(0.00778)	(0.15819)	(0.53014)
	[0.36989]	[-0.03747]	[0.10916]	[-1.44002]	[0.47859]	[2.45041]
D(LFDI(-1))	0.156329	-0.28241	0.016689	0.025218	-1.31E-05	-1.40235
	(0.09533)	(0.07574)	(0.01827)	(0.01187)	(0.24124)	(0.80847)
	[1.63989]	[-3.72884]	[0.91339]	[2.12529]	[-5.5e-05]	[-1.73457]
D(LFDI(-2))	0.024613	-0.11207	0.001994	0.001176	0.003532	-0.43331
	(0.08109)	(0.06442)	(0.01554)	(0.01009)	(0.20520)	(0.68771)
	[0.30353]	[-1.73948]	[0.12830]	[0.11654]	[0.01721]	[-0.63008]
D(LFPI(-1))	-0.10186	0.532448	-0.31633	0.024120	-3.00466	-7.918
	(0.48128)	(0.38237)	(0.09224)	(0.05990)	(1.21790)	(4.08164)
	[-0.21165]	[1.39251]	[-3.42926]	[0.40264]	[-2.46708]	[-1.93990]
D(LFPI(-2))	0.222857	0.291513	-0.28102	0.019866	-1.65422	-4.22153
	(0.37368)	(0.29689)	(0.07162)	(0.04651)	(0.94563)	(3.16916)
	[0.59638]	[0.98190]	[-3.92365]	[0.42711]	[-1.74933]	[-1.33207]

D(LCOP(-1))	3.457588	-0.30659	0.009441	0.213710	0.832621	4.802483
	(0.53086)	(0.42176)	(0.10175)	(0.06608)	(1.34338)	(4.50216)
	[6.51318]	[-0.72693]	[0.09279]	[3.23432]	[0.61980]	[1.06671]
D(LCOP(-2))	-0.25052	0.210135	0.025145	0.038086	-1.51917	1.288448
	(0.57649)	(0.45801)	(0.11049)	(0.07175)	(1.45884)	(4.88910)
	[-0.43456]	[0.45880]	[0.22758]	[0.53078]	[-1.04135]	[0.26353]
D(NEER(-1))	-0.02306	-0.00503	0.004455	0.001756	0.201440	-0.25251
	(0.02569)	(0.02041)	(0.00492)	(0.00320)	(0.06500)	(0.21783)
	[-0.89790]	[-0.24663]	[0.90495]	[0.54911]	[3.09915]	[-1.15919]
D(NEER(-2))	0.044626	0.012921	-0.00745	0.000738	-0.11749	-0.18679
	(0.02550)	(0.02026)	(0.00489)	(0.00317)	(0.06452)	(0.21623)
	[1.75027]	[0.63788]	[-1.52392]	[0.23259]	[-1.82104]	[-0.86384]
D(IIP(-1))	0.016429	-0.01563	0.001962	-0.00199	0.048177	-0.66881
	(0.00822)	(0.00653)	(0.00158)	(0.00102)	(0.02080)	(0.06971)
	[1.99868]	[-2.39321]	[1.24505]	[-1.94385]	[2.31607]	[-9.59391]
D(IIP(-2))	-0.01261	-0.00339	0.003237	-0.00135	0.037821	-0.13673
	(0.00793)	(0.00630)	(0.00152)	(0.00099)	(0.02008)	(0.06729)
	[-1.58979]	[-0.53755]	[2.12876]	[-1.36995]	[1.88366]	[-2.03193]
C	0.227768	0.045550	0.006228	0.009066	-0.26856	1.726831
	(0.05185)	(0.04119)	(0.00994)	(0.00645)	(0.13121)	(0.43972)
	[4.39294]	[1.10577]	[0.62677]	[1.40482]	[-2.04683]	[3.92710]
R-squared	0.472630	0.351523	0.365236	0.114040	0.140208	0.457616
Adj. R-squared	0.441994	0.313852	0.328361	0.062574	0.090261	0.426108
Sum sq. resids	101.9583	64.35659	3.745448	1.579596	652.9168	7333.365
S.E. equation	0.650433	0.516759	0.124665	0.080959	1.645964	5.516240
F-statistic	15.42745	9.331419	9.904891	2.215813	2.807157	14.52388
Log likelihood	-245.41	-186.514	177.5052	288.0168	-483.091	-792.69
Akaike AIC	2.034451	1.574326	-1.26957	-2.13294	3.891337	6.310077

Schwarz SC	2.242176	1.782052	-1.06185	-1.92522	4.099062	6.517802
Mean dependent	0.456833	0.009623	0.004239	0.006643	-0.24097	0.497146
S.D. dependent	0.870730	0.623848	0.152116	0.083617	1.725687	7.281620
Determinant resid covariance (dof adj.)		0.000734		**Akaike information criterion**		10.24547
Determinant resid covariance		0.000511		**Schwarz criterion**		11.65800
Log likelihood		-1209.42				

Table C.5: Correlation Matrix of Foreign Investment and Exchange Rate

	FDI	**FPI**	**NEER**
FDI	1.000000	0.049163	-0.712854
FPI	0.049163	1.000000	-0.099221
NEER	-0.712854	-0.099221	1.000000

Table C.6: Vector Error Correction Estimate of Foreign Investment and Exchange Rate

Vector Error Correction Estimates		
Standard errors in ( ) & t-statistics in [ ]		
Cointegrating Eq:	**CointEq1**	**CointEq2**
NEER(-1)	1.000000	0.000000
LFDI(-1)	0.000000	1.000000
LFPI(-1)	-75.19891	1.860383
	(22.9928)	(2.38026)
	[-3.27054]	[0.78159]
LWPI(-1)	168.0663	10.14187
	(24.0419)	(2.48886)
	[6.99056]	[4.07491]
	-179.9174	-17.92958
	(26.0877)	(2.70064)

LEXP(-1)

	[-6.89664]	[-6.63900]
LIMP(-1)	123.0480	11.39947
	(19.4549)	(2.01401)
	[6.32477]	[5.66009]
C	334.9864	-17.17651

Error Correction:	**D(NEER)**	**D(LFDI)**	**D(LFPI)**	**D(LWPI)**	**D(LEXP)**	**D(LIMP)**
CointEq1	-0.038449	0.010566	0.004170	-1.03E-05	-0.000144	-0.001887
	(0.01363)	(0.00452)	(0.00105)	(4.6E-05)	(0.00076)	(0.00071)
	[-2.82082]	[2.33773]	[3.95267]	[-0.22367]	[-0.18869]	[-2.64016]
CointEq2	0.348049	-0.159208	-0.039501	-0.000654	0.009492	-0.001761
	(0.14279)	(0.04735)	(0.01105)	(0.00048)	(0.00797)	(0.00749)
	[2.43755]	[-3.36244]	[-3.57451]	[-1.35100]	[1.19096]	[-0.23531]
D(NEER(-1))	0.184277	0.002127	0.006994	-0.000272	-0.004143	0.000980
	(0.06503)	(0.02156)	(0.00503)	(0.00022)	(0.00363)	(0.00341)
	[2.83364]	[0.09863]	[1.38957]	[-1.23321]	[-1.14119]	[0.28747]
D(NEER(-2))	-0.085797	0.013175	-0.008535	0.000705	0.002691	0.001693
	(0.06390)	(0.02119)	(0.00495)	(0.00022)	(0.00357)	(0.00335)
	[-1.34278]	[0.62180]	[-1.72588]	[3.25433]	[0.75447]	[0.50556]
D(LFDI(-1))	-0.119478	-0.454109	0.022350	0.000171	-0.004548	-0.010289
	(0.20639)	(0.06844)	(0.01597)	(0.00070)	(0.01152)	(0.01082)
	[-0.57890]	[-6.63518]	[1.39925]	[0.24381]	[-0.39481]	[-0.95093]
D(LFDI(-2))	-0.087091	-0.220501	0.003688	-0.000452	0.000981	0.000988
	(0.19209)	(0.06370)	(0.01487)	(0.00065)	(0.01072)	(0.01007)
	[-0.45340]	[-3.46175]	[0.24806]	[-0.69363]	[0.09146]	[0.09815]
D(LFPI(-1))	-2.389819	0.801970	-0.331945	-0.003042	0.004082	-0.058428
	(1.13038)	(0.37484)	(0.08748)	(0.00383)	(0.06310)	(0.05926)
	[-2.11418]	[2.13951]	[-3.79438]	[-0.79397]	[0.06470]	[-0.98595]
D(LFPI(-2))	-1.509605	0.380036	-0.278302	-0.001272	0.007409	-0.076688
	(0.89706)	(0.29747)	(0.06943)	(0.00304)	(0.05007)	(0.04703)
	[-1.68284]	[1.27756]	[-4.00860]	[-0.41837]	[0.14796]	[-1.63067]
D(LWPI(-1))	-30.56416	-4.846729	-0.695401	0.426127	1.065648	3.411081
	(18.7940)	(6.23219)	(1.45453)	(0.06371)	(1.04906)	(0.98529)

	[-1.62627]	[-0.77769]	[-0.47810]	[6.68880]	[1.01581]	[3.46202]
D(LWPI(-2))	-3.673999	-7.777251	-0.506709	0.019043	1.384050	1.404602
	(18.8957)	(6.26590)	(1.46239)	(0.06405)	(1.05474)	(0.99062)
	[-0.19444]	[-1.24120]	[-0.34649]	[0.29731]	[1.31222]	[1.41791]
D(LEXP(-1))	3.963816	-0.819498	0.215412	0.013699	-0.407081	-0.181835
	(1.70693)	(0.56603)	(0.13210)	(0.00579)	(0.09528)	(0.08949)
	[2.32220]	[-1.44781]	[1.63063]	[2.36758]	[-4.27252]	[-2.03198]
D(LEXP(-2))	3.445409	-0.581738	0.048502	0.001285	-0.184531	-0.07978
	(1.47042)	(0.48760)	(0.11380)	(0.00498)	(0.08208)	(0.07709)
	[2.34315]	[-1.19307]	[0.42620]	[0.25774]	[-2.24826]	[-1.03493]
D(LIMP(-1))	0.071333	0.274718	-0.238649	0.002168	-0.27995	-0.423058
	(1.46589)	(0.48610)	(0.11345)	(0.00497)	(0.08182)	(0.07685)
	[0.04866]	[0.56515]	[-2.10356]	[0.43630]	[-3.42135]	[-5.50498]
D(LIMP(-2))	-0.40944	0.778684	-0.065602	0.002228	-0.013798	0.018687
	(1.38219)	(0.45834)	(0.10697)	(0.00469)	(0.07715)	(0.07246)
	[-0.29623]	[1.69892]	[-0.61327]	[0.47562]	[-0.17883]	[0.25789]
C	-0.129654	0.074142	0.009118	0.002217	0.005499	-0.003558
	(0.12841)	(0.04258)	(0.00994)	(0.00044)	(0.00717)	(0.00673)
	[-1.00966]	[1.74114]	[0.91742]	[5.09364]	[0.76713]	[-0.52857]
R-squared	0.171785	0.303130	0.361560	0.334460	0.350310	0.353822
Adj. R-squared	0.123673	0.262648	0.324472	0.295797	0.312569	0.316285
Sum sq. resids	628.9374	69.15922	3.767135	0.007227	1.959613	1.728596
S.E. equation	1.615456	0.535694	0.125025	0.005476	0.090173	0.084691
F-statistic	3.570511	7.488001	9.748769	8.650836	9.281863	9.425889
Log likelihood	-478.3016	-195.7262	176.7662	977.5678	260.4228	276.4789
Akaike AIC	3.853919	1.646299	-1.263798	-7.520061	-1.917366	-2.042804
Schwarz SC	4.061644	1.854024	-1.056073	-7.312336	-1.709641	-1.835078

<table>
<tr><td>Mean dependent</td><td>-0.24097</td><td>0.009623</td><td>0.004239</td><td>0.004057</td><td>0.008438</td><td>0.009488</td></tr>
<tr><td>S.D. dependent</td><td>1.725687</td><td>0.623848</td><td>0.152116</td><td>0.006526</td><td>0.108758</td><td>0.102424</td></tr>
<tr><td colspan="2">Determinant resid covariance (dof adj.)</td><td colspan="2">1.21E-11</td><td colspan="2">Akaike information criterion</td><td>-7.67989</td></tr>
<tr><td colspan="2">Determinant resid covariance</td><td colspan="2">8.39E-12</td><td colspan="2" rowspan="2">Schwarz criterion</td><td rowspan="2">-6.267358</td></tr>
<tr><td colspan="2">Log likelihood</td><td colspan="2">1085.026</td></tr>
</table>

Table C.7: Correlation Matrix of Foreign Investment and Economic Growth

	FDI	**FPI**	**IIP**
FDI	1.000000	0.049163	0.779384
FPI	0.049163	1.000000	0.165983
IIP	0.779384	0.165983	1.000000

Table C.8: Vector Error Correction Estimate of Foreign Investment and Economic Growth

Vector Error Correction Estimates	
Standard errors in ( ) & t-statistics in [ ]	
Cointegrating Eq:	**CointEq1**
IIP(-1)	1.000000
LFDI(-1)	-13.72089
	(1.72640)
	[-7.94769]
LFPI(-1)	-47.18273
	(13.0643)
	[-3.61158]
LIR(-1)	4.878619
	(2.44605)
	[1.99449]
LNEER(-1)	8.954999
	(22.2014)
	[0.40335]
LWPI(-1)	-70.74676
	(26.9959)
	[-2.62065]
LEXP(-1)	-2.692716
	(6.96624)
	[-0.38654]
C	745.8380

Error Correction:	**D(IIP)**	**D(LFDI)**	**D(LFPI)**	**D(LIR)**	**D(LNEER)**	**D(LWPI)**	**D(LEXP)**
CointEq1	-0.219095	0.022143	0.002469	-0.00627	-0.000125	0.000168	-0.000373
	(0.05264)	(0.00524)	(0.00127)	(0.00272)	(0.00017)	(5.4E-05)	(0.00089)
	[-4.16215]	[4.22798]	[1.94602]	[-2.30238]	[-0.75091]	[3.11662]	[-0.41838]
D(IIP(-1))	-0.41963	-0.012366	-0.001133	0.003826	0.000393	-1.72E-05	-0.000891
	(0.08154)	(0.00811)	(0.00197)	(0.00422)	(0.00026)	(8.4E-05)	(0.00138)
	[-5.14626]	[-1.52433]	[-0.57634]	[0.90699]	[1.52351]	[-0.20556]	[-0.64566]
D(IIP(-2))	0.098500	-0.004204	0.003301	0.007658	0.000585	-0.000166	0.002426

	(0.08381)	(0.00834)	(0.00202)	(0.00434)	(0.00026)	(8.6E-05)	(0.00142)
	[1.17532]	[-0.50416]	[1.63435]	[1.76646]	[2.20808]	[-1.93185]	[1.71098]
D(IIP(-3))	0.241016	-0.000797	-0.00022	0.008237	0.000272	-1.14E-05	0.003698
	(0.07355)	(0.00732)	(0.00177)	(0.00380)	(0.00023)	(7.6E-05)	(0.00124)
	[3.27705]	[-0.10895]	[-0.12398]	[2.16498]	[1.16975]	[-0.15037]	[2.97217]
D(LFDI(-1))	-2.863345	-0.404381	0.019222	-0.144812	-0.000978	0.001436	-0.007212
	(0.80465)	(0.08006)	(0.01939)	(0.04162)	(0.00254)	(0.00083)	(0.01361)
	[-3.55851]	[-5.05127]	[0.99117]	[-3.47901]	[-0.38458]	[1.73866]	[-0.52984]
D(LFDI(-2))	-1.216691	-0.235667	0.017960	-0.07925	-0.001086	0.000298	0.003505
	(0.78886)	(0.07848)	(0.01901)	(0.04081)	(0.00249)	(0.00081)	(0.01334)
	[-1.54235]	[-3.00272]	[0.94467]	[-1.94204]	[-0.43545]	[0.36766]	[0.26270]
D(LFDI(-3))	-0.860176	-0.134919	0.015899	-0.010692	-0.000157	0.000290	0.002578
	(0.66435)	(0.06610)	(0.01601)	(0.03437)	(0.00210)	(0.00068)	(0.01124)
	[-1.29476]	[-2.04122]	[0.99298]	[-0.31113]	[-0.07472]	[0.42480]	[0.22941]
D(LFPI(-1))	-12.02734	0.613735	-0.53161	-0.220548	0.002823	0.003075	-0.021344
	(3.65695)	(0.36383)	(0.08814)	(0.18917)	(0.01156)	(0.00375)	(0.06186)
	[-3.28890]	[1.68686]	[-6.03166]	[-1.16584]	[0.24428]	[0.81910]	[-0.34504]
D(LFPI(-2))	-5.112891	0.289338	-0.382948	-0.196302	0.014469	0.004337	-0.020828
	(3.61660)	(0.35982)	(0.08716)	(0.18709)	(0.01143)	(0.00371)	(0.06118)
	[-1.41373]	[0.80412]	[-4.39339]	[-1.04925]	[1.26596]	[1.16795]	[-0.34045]
D(LFPI(-3))	2.311005	-0.209975	0.001985	-0.079805	0.027332	0.002758	0.019060
	(3.03438)	(0.30189)	(0.07313)	(0.15697)	(0.00959)	(0.00312)	(0.05133)
	[0.76161]	[-0.69553]	[0.02714]	[-0.50841]	[2.85029]	[0.88522]	[0.37133]
D(LIR(-1))	0.778763	-0.017326	0.039393	-0.314987	0.001962	-0.001748	0.010787
	(1.28408)	(0.12776)	(0.03095)	(0.06643)	(0.00406)	(0.00132)	(0.02172)
	[0.60647]	[-0.13562]	[1.27289]	[-4.74193]	[0.48356]	[-1.32585]	[0.49660]
D(LIR(-2))	2.609638	0.034539	0.001786	-0.244213	0.006182	-0.001016	0.033609
	(1.30569)	(0.12990)	(0.03147)	(0.06754)	(0.00413)	(0.00134)	(0.02209)
	[1.99867]	[0.26588]	[0.05675]	[-3.61564]	[1.49835]	[-0.75794]	[1.52169]
D(LIR(-3))	1.523355	-0.106572	-0.039639	-0.037918	-0.000786	-0.002348	-0.020496
	(1.28090)	(0.12744)	(0.03087)	(0.06626)	(0.00405)	(0.00132)	(0.02167)
	[1.18929]	[-0.83627]	[-1.28401]	[-0.57225]	[-0.19407]	[-1.78518]	[-0.94595]
D(LNEER(-1))	-34.93417	0.606462	0.612312	-2.066965	0.165635	-0.026603	-0.639685

	(21.7885)	(2.16776)	(0.52513)	(1.12712)	(0.06886)	(0.02237)	(0.36857)
	[-1.60333]	[0.27976]	[1.16602]	[-1.83384]	[2.40553]	[-1.18922]	[-1.73560]
D(LNEER(-2))	-13.66622	2.292261	-0.977749	-0.613521	-0.033001	0.071448	0.403893
	(21.5443)	(2.14347)	(0.51924)	(1.11449)	(0.06808)	(0.02212)	(0.36444)
	[-0.63433]	[1.06942]	[-1.88303]	[-0.55049]	[-0.48470]	[3.23012]	[1.10827]
D(LNEER(-3))	-11.81517	0.327811	-0.510526	-0.838664	-0.042914	-0.013166	-0.227816
	(21.7744)	(2.16636)	(0.52479)	(1.12639)	(0.06881)	(0.02236)	(0.36833)
	[-0.54262]	[0.15132]	[-0.97282]	[-0.74456]	[-0.62364]	[-0.58896]	[-0.61851]
D(LWPI(-1))	-285.3161	-7.153205	-1.248278	4.742548	-0.192309	0.462285	0.697824
	(64.4731)	(6.41451)	(1.55388)	(3.33521)	(0.20375)	(0.06619)	(1.09060)
	[-4.42535]	[-1.11516]	[-0.80333]	[1.42197]	[-0.94386]	[6.98386]	[0.63985]
D(LWPI(-2))	108.2894	-1.606452	-0.217153	-5.780665	0.086986	0.029596	0.832032
	(71.6685)	(7.13038)	(1.72730)	(3.70742)	(0.22649)	(0.07358)	(1.21232)
	[1.51098]	[-0.22530]	[-0.12572]	[-1.55921]	[0.38407]	[0.40223]	[0.68631]
D(LWPI(-3))	21.64048	2.629701	2.895911	5.331461	-0.221233	-0.047117	-0.570349
	(63.7542)	(6.34298)	(1.53655)	(3.29802)	(0.20148)	(0.06546)	(1.07844)
	[0.33944]	[0.41458]	[1.88468]	[1.61657]	[-1.09807]	[-0.71984]	[-0.52886]
D(LEXP(-1))	-8.76033	-0.290134	0.048397	-0.119242	0.039192	0.017846	-0.537863
	(4.40288)	(0.43805)	(0.10611)	(0.22776)	(0.01391)	(0.00452)	(0.07448)
	[-1.98968]	[-0.66233]	[0.45608]	[-0.52354]	[2.81676]	[3.94781]	[-7.22181]
D(LEXP(-2))	-10.30288	0.125159	-0.188187	-0.026345	0.016346	0.008907	-0.247928
	(5.08754)	(0.50617)	(0.12262)	(0.26318)	(0.01608)	(0.00522)	(0.08606)
	[-2.02512]	[0.24727]	[-1.53477]	[-0.10010]	[1.01670]	[1.70523]	[-2.88090]
D(LEXP(-3))	-4.620005	0.406920	-0.04773	0.228786	-0.014475	-0.001849	-0.057225
	(4.70369)	(0.46798)	(0.11336)	(0.24332)	(0.01486)	(0.00483)	(0.07957)
	[-0.98221]	[0.86953]	[-0.42103]	[0.94026]	[-0.97379]	[-0.38293]	[-0.71922]
C	1.225551	0.060678	-0.00371	-0.037917	-0.001764	0.002157	0.006957
	(0.47468)	(0.04723)	(0.01144)	(0.02456)	(0.00150)	(0.00049)	(0.00803)
	[2.58182]	[1.28483]	[-0.32430]	[-1.54413]	[-1.17570]	[4.42497]	[0.86646]
R-squared	0.504575	0.361044	0.370016	0.227247	0.198017	0.377309	0.378940
Adj. R-squared	0.457392	0.300191	0.310018	0.153652	0.121637	0.318005	0.319791

Sum sq. resids	6396.539	63.31609	3.715538	17.11720	0.063881	0.006742	1.830300
S.E. equation	5.262190	0.523541	0.126825	0.272214	0.016630	0.005403	0.089013
F-statistic	10.69392	5.933059	6.167097	3.087785	2.592543	6.362299	6.406573
Log likelihood	-770.135	-183.9827	176.1406	-17.85958	692.1745	977.7466	266.0621
Akaike AIC	6.245158	1.629785	-1.205831	0.321729	-5.269091	-7.51769	-1.913875
Schwarz SC	6.565467	1.950095	-0.885521	0.642039	-4.948781	-7.19738	-1.593565
Mean dependent	0.395515	0.011458	0.004052	-0.002613	-0.002487	0.004031	0.007292
S.D. dependent	7.143701	0.625837	0.152681	0.295894	0.017744	0.006542	0.107928
Determinant resid covariance (dof adj.)		3.38E-13		**Akaike information criterion**		-8.193093	
Determinant resid covariance		1.74E-13		**Schwarz criterion**		-5.853439	
Log likelihood		1208.523					

Table C.9: Correlation Matrix of Foreign Investment and Export

	FDI	**FPI**	**EXP**
FDI	1.000000	0.049163	0.761374
FPI	0.049163	1.000000	0.141230
EXP	0.761374	0.141230	1.000000

Appendix D

Stock Market Development Indicators

Table D.1: Correlation Matrix of Foreign Institutional Investment and BSE Sensex Return

	ASR	**FII**
ASR	1.000000	0.404798
FII	0.404798	1.000000

Table D.2: Correlation Matrix of Foreign Institutional Investment and NSE Nifty Return

	ANR	**FII**
ANR	1.000000	0.414353
FII	0.414353	1.000000

Table D.3: Name of Sector Specific BSE Indices

Sr. No	Name of Index	Name of the Index considered in present study in various Table
1	S& P BSE Auto	Auto
2	S& P BSE Bankex	Bankex
3	S& P BSE Basic Materials	Basic Materials
4	S& P BSE Capital Goods	Capital Goods
5	S& P BSE Consumer Discretionary Goods & Service	Consumer Discretionary Goods & Service
6	S& P BSE Consumer Durables	Consumer Durables
7	S& P BSE Energy	Energy
8	S& P BSE Finance	Finance
9	S& P BSE Fast Moving Consumer Goods	Fast Moving Consumer Goods
10	S& P BSE Healthcare	Healthcare
11	S& P BSE Industrials	Industrials
12	S&P BSE Information Technology	Information Technology
13	S& P BSE Metal	Metal
14	S& P BSE Oil & Gas	Oil & Gas
15	S& P BSE Power	Power
16	S& P BSE Reality	Reality
17	S& P BSE Teck	Teck
18	S& P BSE Telecom	Telecom
18	S& P BSE Utilities	Utilities
20	S& P BSE PSU	PSU

Table D.4: Correlation Matrix of Foreign Institutional Investment and Turnover of the Market

	FIIs	**TO**
FIIs	1.000000	0.231237
TO	0.231237	1.000000

Table D.5: Correlation Matrix of Foreign Institutional Investment and Market Capitaliation

	FIIs	**MC BSE**
FIIs	1.000000	0.280500
MC BSE	0.280500	1.000000

Table D.6: Correlation Matrix of Foreign Institutional Investment and P.E. Ratio

	FIIs	**P.E. Ratio**
FIIs	1.000000	0.137445
P.E. Ratio	0.137445	1.000000

Appendix E

Database

Table E.1: Macroeconomic Variables (US $ Million) - I

Year	FDI	FPI	FER	WPI	NEER	REER
1995M04	149.00	229.00	25037.00	62.44	131.16	148.24
1995M05	208.00	229.00	24707.00	63.13	131.16	150.21
1995M06	206.00	229.00	24153.00	63.35	132.16	149.81
1995M07	143.00	229.00	24347.00	63.70	131.54	151.56
1995M08	126.00	229.00	23449.00	64.11	131.59	153.78
1995M09	173.00	229.00	23477.00	64.39	133.94	147.82
1995M10	222.00	229.00	22200.00	64.50	129.05	140.93
1995M11	124.00	229.00	21782.00	64.82	122.79	140.73
1995M12	148.00	229.00	22063.00	64.46	122.27	140.18
1996M01	166.00	229.00	20945.00	64.39	122.23	138.06
1996M02	161.00	229.00	20652.00	64.50	120.64	134.55
1996M03	2144.00	229.00	21687.00	64.82	117.79	143.24
1996M04	278.00	276.00	21620.00	65.56	125.83	145.18
1996M05	143.00	276.00	21620.00	65.97	127.57	143.31
1996M06	170.00	276.00	22091.00	66.23	125.28	144.04
1996M07	190.00	276.00	22441.00	67.51	125.32	143.22
1996M08	187.00	276.00	22441.00	68.07	122.70	142.45
1996M09	153.00	276.00	22900.00	68.59	121.37	143.11
1996M10	215.00	276.00	23635.00	68.74	122.03	143.62

1996M11	320.00	276.00	23752.00	69.07	122.95	142.12
1996M12	292.00	276.00	24110.00	69.30	121.48	143.65
1997M01	262.00	276.00	23973.00	69.24	122.40	145.46
1997M02	359.00	276.00	23674.00	69.59	124.21	149.64
1997M03	2821.00	276.00	26423.00	69.43	127.59	150.46
1997M04	473.00	152.00	26667.00	69.78	128.39	151.90
1997M05	408.00	152.00	28096.00	69.80	129.15	150.18
1997M06	283.00	152.00	29331.00	70.02	128.02	150.74
1997M07	271.00	152.00	29789.00	70.26	128.00	153.15
1997M08	163.00	152.00	30228.00	70.58	129.89	155.56
1997M09	359.00	152.00	29435.00	71.15	131.74	152.66
1997M10	297.00	152.00	30022.00	71.77	128.63	152.53
1997M11	231.00	21.00	27893.00	71.79	128.26	147.35
1997M12	225.00	287.00	27355.00	72.40	124.06	143.01
1998M01	226.00	-57.00	27838.00	73.22	119.74	145.46
1998M02	203.00	-88.00	27461.00	73.03	120.58	145.76
1998M03	257.00	231.00	29367.00	72.92	121.53	144.10
1998M04	275.00	-31.00	29452.00	73.72	120.17	144.30
1998M05	210.00	-115.00	28671.00	74.44	119.55	141.95
1998M06	377.00	-269.00	27034.00	75.24	116.64	138.64
1998M07	117.00	-26.00	27088.00	76.08	112.53	139.25
1998M08	130.00	-48.00	27765.00	76.47	112.01	138.36
1998M09	141.00	-43.00	29182.00	77.23	111.61	134.90
1998M10	66.00	-140.00	29757.00	77.71	108.82	133.03
1998M11	93.00	-50.00	29667.00	77.62	106.38	135.24
1998M12	153.00	40.00	30056.00	76.97	107.57	133.92
1999M01	161.00	62.00	30445.00	76.67	106.68	134.09
1999M02	210.00	48.00	30758.00	76.93	107.53	137.40
1999M03	294.00	511.00	32490.00	76.58	109.69	139.40
1999M04	140.00	458.00	32538.00	76.90	111.31	138.05
1999M05	149.00	400.00	33475.00	77.25	111.27	139.07
1999M06	154.00	44.00	33265.00	77.58	111.67	139.75
1999M07	205.00	252.00	33422.00	77.86	111.71	139.98

1999M08	345.00	36.00	33269.00	78.18	111.57	137.82
1999M09	96.00	162.00	33203.00	79.31	109.19	137.53
1999M10	128.00	4.00	33805.00	79.98	108.69	137.59
1999M11	113.00	203.00	34359.00	79.83	107.70	139.97
1999M12	159.00	357.00	34935.00	79.11	109.33	139.85
2000M01	119.00	142.00	34896.00	79.11	109.91	139.50
2000M02	290.00	477.00	35903.00	79.38	109.62	142.15
2000M03	257.00	491.00	38036.00	81.06	111.61	145.66
2000M04	83.00	624.00	37896.00	82.26	112.36	146.55
2000M05	349.00	324.00	37245.00	82.31	112.81	148.84
2000M06	230.00	-159.00	36730.00	82.80	114.39	144.38
2000M07	254.00	-16.00	36231.00	83.02	110.65	145.14
2000M08	172.00	171.00	35619.00	83.18	110.97	144.81
2000M09	91.00	246.00	35438.00	83.88	110.44	147.55
2000M10	176.00	-231.00	34899.00	85.62	112.03	149.97
2000M11	113.00	78.00	39040.00	85.78	111.57	149.21
2000M12	181.00	116.00	40077.00	85.94	110.87	147.09
2001M01	335.00	451.00	41120.00	86.00	109.03	145.89
2001M02	193.00	670.00	41608.00	86.00	107.87	147.12
2001M03	162.00	486.00	42281.00	86.27	108.83	148.45
2001M04	191.00	247.00	42526.00	86.70	109.66	147.36
2001M05	258.00	280.00	42991.00	86.92	110.28	148.06
2001M06	159.00	423.00	43454.00	87.19	110.71	149.76
2001M07	228.00	131.00	43730.00	87.35	111.77	149.77
2001M08	633.00	289.00	45358.00	87.68	111.25	147.46
2001M09	376.00	-160.00	44877.00	87.68	109.05	144.27
2001M10	204.00	35.00	45256.00	88.11	106.88	144.67
2001M11	316.00	70.00	46891.00	88.01	106.52	146.29
2001M12	347.00	28.00	48112.00	87.73	107.58	146.96
2002M01	239.00	131.00	49479.00	87.30	107.99	146.14
2002M02	140.00	271.00	50776.00	87.19	107.83	145.90
2002M03	813.00	276.00	54106.00	87.79	107.87	145.70
2002M04	174.00	-73.00	55870.00	88.01	107.28	141.92

2002M05	491.00	107.00	56779.00	88.28	106.45	139.81
2002M06	400.00	-272.00	58693.00	89.31	104.46	139.04
2002M07	154.00	43.00	60607.00	89.79	102.70	137.25
2002M08	139.00	-33.00	62140.00	90.61	100.72	139.95
2002M09	204.00	-131.00	63620.00	90.77	101.81	140.37
2002M10	213.00	108.00	65159.00	90.83	102.04	140.77
2002M11	157.00	184.00	67578.00	90.99	102.37	140.08
2002M12	110.00	453.00	71110.00	90.66	101.61	139.22
2003M01	157.00	301.00	74256.00	90.99	101.16	137.79
2003M02	192.00	77.00	73547.00	91.86	99.66	97.90
2003M03	183.00	215.00	76100.00	93.05	99.93	99.13
2003M04	58.00	300.00	78325.00	93.86	100.89	98.85
2003M05	122.00	469.00	82308.00	94.02	98.78	97.40
2003M06	168.00	629.00	83221.00	94.08	99.10	97.87
2003M07	180.00	425.00	85551.00	94.02	101.33	100.02
2003M08	196.00	778.00	87306.00	94.19	102.92	101.74
2003M09	262.00	933.00	92339.00	95.22	102.56	102.29
2003M10	127.00	1622.00	93803.00	95.49	101.13	101.09
2003M11	142.00	889.00	97400.00	95.92	100.78	101.24
2003M12	270.00	1599.00	103151.00	95.87	98.44	99.08
2004M01	122.00	1161.00	106384.00	96.90	97.33	99.11
2004M02	382.00	738.00	109572.00	97.49	97.34	99.79
2004M03	168.00	1834.00	112959.00	97.49	99.37	101.52
2004M04	217.00	938.00	118490.00	98.09	104.16	102.11
2004M05	217.00	-314.00	119379.00	98.74	101.53	100.23
2004M06	380.00	-467.00	119511.00	100.42	100.15	99.25
2004M07	173.00	-410.00	118385.00	101.18	98.56	98.28
2004M08	601.00	450.00	118154.00	102.16	98.39	99.01
2004M09	282.00	424.00	119579.00	102.70	98.91	99.57
2004M10	214.00	848.00	121337.00	102.43	98.69	99.72
2004M11	186.00	3051.00	128226.00	103.13	98.26	99.06
2004M12	316.00	804.00	131178.00	102.37	99.20	99.37
2005M01	152.00	-130.00	129463.00	102.27	100.61	101.31

2005M02	238.00	2467.00	135900.00	102.37	101.23	101.55
2005M03	275.00	1654.00	141514.00	102.70	100.63	100.70
2005M04	268.00	-286.00	141841.00	102.70	101.43	101.79
2005M05	654.00	-123.00	138857.00	102.50	102.79	102.73
2005M06	264.00	1382.00	138370.00	102.90	104.48	104.21
2005M07	324.00	1809.00	140542.00	104.00	105.40	106.38
2005M08	399.00	1289.00	144079.00	104.10	103.99	105.24
2005M09	282.00	1342.00	143059.00	104.90	103.27	104.20
2005M10	412.00	88.00	143573.00	105.40	102.27	103.87
2005M11	746.00	271.00	142821.00	105.50	101.33	104.37
2005M12	342.00	2389.00	137206.00	104.90	101.26	103.96
2006M01	482.00	1545.00	140374.00	105.40	103.07	105.29
2006M02	127.00	1821.00	142400.00	105.60	103.88	106.03
2006M03	1240.00	966.00	151622.00	105.70	103.28	105.33
2006M04	661.00	3711.00	160677.00	107.80	101.11	103.48
2006M05	538.00	-3334.00	163868.00	108.70	97.94	101.51
2006M06	523.00	-903.00	162912.00	109.90	97.10	101.53
2006M07	1127.00	-309.00	164577.00	110.80	96.19	100.77
2006M08	619.00	1212.00	166244.00	111.50	95.50	100.78
2006M09	916.00	1238.00	165305.00	112.20	96.55	102.81
2006M10	1698.00	1755.00	167392.00	112.70	98.33	106.04
2006M11	1151.00	2236.00	174641.00	112.60	98.67	106.43
2006M12	5130.00	-429.00	177251.00	112.20	97.93	104.96
2007M01	1921.00	1602.00	180161.00	112.40	99.26	105.91
2007M02	698.00	2630.00	194563.00	112.60	99.40	106.15
2007M03	603.00	-2406.00	199179.00	112.80	99.12	105.48
2007M04	1643.00	1974.00	204409.00	114.50	102.62	109.70
2007M05	2120.00	1852.00	208068.00	114.70	106.05	113.92
2007M06	1238.00	3664.00	213362.00	114.80	106.29	114.21
2007M07	705.00	6713.00	227107.00	115.70	105.99	114.97
2007M08	831.00	-2875.00	228847.00	116.00	104.99	114.31
2007M09	713.00	7081.00	247762.00	116.00	105.29	114.77
2007M10	2027.00	9564.00	264692.00	116.30	106.47	116.38

2007M11	1864.00	-107.00	273520.00	116.80	104.91	114.32
2007M12	1558.00	5294.00	275316.00	116.70	105.31	114.57
2008M01	1767.00	6739.00	293240.00	117.50	104.80	113.39
2008M02	5670.00	-8904.00	301235.00	119.00	103.49	112.00
2008M03	4438.00	-1600.00	309723.00	121.50	99.27	108.74
2008M04	3749.00	-880.00	314155.00	123.50	99.35	109.59
2008M05	3932.00	-288.00	314614.00	124.10	94.86	104.68
2008M06	2392.00	-3010.00	312087.00	127.30	93.26	103.21
2008M07	2247.00	-492.00	306176.00	128.60	92.49	103.44
2008M08	2328.00	593.00	295309.00	128.90	94.33	107.36
2008M09	2562.00	-1403.00	286336.00	128.50	90.35	104.13
2008M10	1497.00	-5243.00	252883.00	128.70	86.86	102.23
2008M11	1083.00	-574.00	247686.00	126.90	88.08	104.62
2008M12	1362.00	30.00	255968.00	124.50	86.83	102.55
2009M01	2733.00	-614.00	248611.00	124.40	87.00	102.65
2009M02	1488.00	-1085.00	249278.00	123.30	87.66	103.33
2009M03	1956.00	-889.00	251985.00	123.50	84.00	99.53
2009M04	2339.00	2278.00	251702.00	125.00	85.28	101.79
2009M05	2095.00	5639.00	262306.00	125.90	86.48	104.65
2009M06	2471.00	353.00	265142.00	126.80	86.71	105.30
2009M07	3476.00	3032.00	271641.00	128.20	85.22	106.83
2009M08	3174.00	1574.00	277252.00	129.60	85.04	107.78
2009M09	1512.00	5095.00	281278.00	130.30	84.19	107.63
2009M10	2332.00	2922.00	284391.00	131.00	86.67	111.63
2009M11	1700.00	1274.00	288146.00	132.90	86.56	113.71
2009M12	1542.00	1533.00	283470.00	133.40	87.21	114.76
2010M01	2042.00	3139.00	280955.00	135.20	89.30	117.62
2010M02	1717.00	230.00	278357.00	135.20	90.03	117.24
2010M03	1209.00	5306.00	279057.00	136.30	92.19	119.85
2010M04	2179.00	3315.00	279633.00	138.60	94.43	122.86
2010M05	2213.00	88.00	273544.00	139.10	93.97	123.66
2010M06	1380.00	1250.00	275710.00	139.80	93.26	123.57
2010M07	1785.00	9114.00	284183.00	141.00	90.76	122.56

2010M08	1330.00	-440.00	283142.00	141.10	90.75	122.75
2010M09	2118.00	10577.00	292870.00	142.00	91.22	124.54
2010M10	1392.00	28704.00	297956.00	142.90	92.18	125.82
2010M11	1628.00	-19811.00	292389.00	143.80	91.37	125.15
2010M12	2014.00	-1502.00	297334.00	146.00	92.29	127.78
2011M01	1042.00	1691.00	299224.00	148.00	91.29	126.89
2011M02	1274.00	-1600.00	301592.00	148.10	90.21	124.18
2011M03	1174.00	-552.00	304818.00	149.50	90.29	124.26
2011M04	2782.00	3544.60	313511.00	152.10	90.12	124.19
2011M05	4074.00	-1583.87	311516.00	152.40	88.99	123.92
2011M06	5317.00	789.07	315715.00	153.10	88.97	124.91
2011M07	1235.07	1560.36	319090.00	154.20	89.95	127.60
2011M08	6177.07	-1796.71	321982.00	154.90	87.72	126.14
2011M09	1902.07	-1147.19	311482.00	156.20	84.61	122.96
2011M10	3035.00	-432.00	316210.00	157.00	81.88	119.29
2011M11	2570.00	76.00	307884.00	157.40	79.55	116.40
2011M12	1385.00	2302.00	296688.00	157.30	77.58	113.19
2012M01	1550.00	5422.00	292766.00	158.70	79.94	115.91
2012M02	1757.00	9228.00	295819.00	159.30	82.75	120.66
2012M03	1174.00	-552.00	294398.00	161.00	81.18	118.88
2012M04	2352.62	-1305.51	294846.00	163.50	78.73	116.40
2012M05	1822.62	11.56	286019.00	163.90	75.53	113.34
2012M06	1739.85	-318.17	289736.00	164.70	74.06	111.96
2012M07	2042.26	2207.99	288775.00	165.80	75.28	115.27
2012M08	2831.70	1565.83	290462.00	167.30	74.87	116.01
2012M09	4648.63	4214.71	294812.00	168.80	75.08	117.24
2012M10	2022.86	2944.99	295254.00	168.50	76.98	120.54
2012M11	1139.80	2026.24	294510.00	168.80	74.78	117.90
2012M12	1181.51	4882.10	295638.00	168.80	74.59	117.78
2013M01	2721.78	6117.44	295508.00	170.30	75.05	118.37
2013M02	2359.64	4176.34	290912.00	170.90	76.07	120.25
2013M03	2089.30	1245.84	292045.60	170.10	76.05	120.79
2013M04	2681.50	1542.00	293892.10	171.30	76.12	121.16

2013M05	1991.34	6703.00	287897.30	171.40	75.33	121.48
2013M06	1804.10	-8707.00	282452.80	173.20	70.37	114.50
2013M07	2166.85	-4703.03	277571.60	175.50	69.06	113.28
2013M08	1918.11	-2018.33	275491.60	179.00	64.81	107.83
2013M09	4643.63	157.29	277233.70	180.70	64.16	107.91
2013M10	1830.20	-366.15	281542.90	180.70	65.78	111.42
2013M11	2241.57	-34.66	290676.70	181.50	65.00	111.91
2013M12	1705.30	2934.49	293876.80	179.60	65.50	111.65
2014M01	2869.12	2615.80	291070.30	179.00	65.36	110.19
2014M02	2697.34	1508.50	294360.20	179.50	65.12	109.60
2014M03	4213.43	5396.84	304223.20	180.30	66.49	112.69
2014M04	2057.55	-68.50	310986.30	180.80	67.33	114.31
2014M05	3956.49	7709.21	312207.00	182.00	68.60	117.47
2014M06	2279.31	4824.13	316138.00	183.00	68.30	117.19
2014M07	3956.41	5416.79	319808.00	185.00	67.85	117.93
2014M08	1734.41	2091.42	318399.70	185.90	67.27	118.55
2014M09	3136.79	2364.22	313841.20	185.00	68.16	119.95
2014M10	3095.70	1721.87	315910.10	183.70	68.01	119.69
2014M11	1977.61	4832.22	315558.40	181.20	68.39	121.13
2014M12	2601.54	-404.23	320648.80	178.70	67.82	119.72
2015M01	4681.28	6634.37	328688.90	177.30	69.68	122.98
2015M02	3488.64	3768.79	337733.20	175.60	70.53	124.21
2015M03	2317.85	3303.07	341638.40	176.10	71.21	125.91
2015M04	4251.40	4244.18	351868.80	176.40	70.39	124.53
2015M05	4496.88	-1962.40	352478.90	178.00	68.49	122.33
2015M06	2700.49	-2224.91	356001.00	179.10	68.43	122.66
2015M07	2351.31	448.37	353460.50	177.60	69.03	123.66
2015M08	2564.76	-2503.78	351437.60	176.50	67.64	122.81
2015M09	3241.37	-1419.80	350288.60	176.50	66.34	121.29
2015M10	5610.72	5291.32	354176.80	176.90	67.50	123.88
2015M11	3302.55	-2970.09	350247.20	177.50	67.33	124.37
2015M12	5003.16	-1758.13	350381.40	176.80	67.02	123.63
2016M01	5250.52	-893.63	349608.90	175.40	66.71	122.82

2016M02	3391.81	-1251.31	348418.10	174.10	65.22	119.35
2016M03	2741.54	1357.58	360176.20	175.30	66.19	121.18
2016M04	2794.00	3141.50	363049.00	177.80	66.12	122.11
2016M05	1415.71	-1621.85	361605.00	180.20	65.81	123.14
2016M06	1677.72	-279.10	363506.10	182.90	65.70	123.36
2016M07	4062.30	2266.56	366503.90	184.20	66.53	125.26
2016M08	4783.79	1558.02	366800.00	183.30	66.39	125.36
2016M09	5130.35	2884.02	371990.30	183.20	66.65	125.67
2016M10	5861.00	-40.30	366211.60	183.60	67.34	127.16
2016M11	4342.97	-6902.37	361121.00	183.50	67.36	127.17
2016M12	3012.62	-4371.39	358898.00	183.30	68.09	127.83
2017M01	4660.76	-388.79	362952.60	184.60	67.73	126.09
2017M02	2214.42	2454.45	364259.00	185.50	68.49	127.80
2017M03	2950.00	9046.00	369955.00	184.51	69.46	129.37
2017M04	3140.00	1945.25	373302.10	184.56	70.64	131.79
2017M05	3972.00	5726.72	380100.60	184.02	70.12	131.69
2017M06	3031.00	4251.26	386539.20	183.70	69.55	130.30
2017M07	4742.00	1010.32	393655.40	185.65	68.97	130.76
2017M08	7919.00	684.59	397822.10	187.12	68.62	131.38
2017M09	2031.00	743.12	400205.30	187.28	67.61	129.20
2017M10	1153.00	3887.02	399225.60	188.42	67.45	129.43
2017M11	1558.00	1627.48	401942.50	189.73	67.68	131.41
2017M12	3290.00	-84.33	409072.40	188.59	68.07	131.95
2018M01	2318.00	3504.65	422367.70	189.08	65.98	129.63
2018M02	4538.00	-2351.05	420963.80	188.75	65.98	125.75
2018M03	4000.00	1273.69	421987.30	189.08	65.31	124.56

Table E.2: Macroeconomic Variables (US $ Million) - II

Year	IIP	COP	EXP	IMP	IR	TO
1995M04	54.72	589.64	2494.00	2467.00	10.91	90.66
1995M05	54.53	579.00	2391.00	3016.00	13.39	99.15
1995M06	53.63	544.19	2418.00	2883.00	14.43	98.84
1995M07	55.34	503.94	2514.00	3086.00	11.28	101.19

1995M08	55.39	520.92	2576.00	3035.00	10.11	101.31
1995M09	56.95	557.81	2396.00	3027.00	12.09	95.22
1995M10	55.48	559.20	2512.00	2811.00	15.59	95.94
1995M11	58.42	584.45	2670.00	3278.00	34.83	101.81
1995M12	62.89	626.82	2939.00	3141.00	16.77	96.68
1996M01	64.12	636.28	2665.00	3410.00	14.53	94.74
1996M02	62.55	647.65	2668.00	2962.00	17.05	90.00
1996M03	68.44	670.30	3463.00	3480.00	28.75	101.45
1996M04	60.94	711.50	2908.00	3045.00	11.38	97.69
1996M05	61.60	669.02	2746.00	3348.00	10.88	98.92
1996M06	58.99	649.40	2636.00	2868.00	10.87	93.30
1996M07	59.33	694.88	2689.00	2937.00	3.59	94.83
1996M08	60.23	720.62	2698.00	3023.00	6.07	94.99
1996M09	59.18	791.08	2648.00	2959.00	8.36	94.74
1996M10	60.32	835.10	2665.00	3228.00	9.58	97.69
1996M11	59.71	795.13	2520.00	3424.00	6.26	99.56
1996M12	65.31	842.56	2804.00	3262.00	8.07	92.89
1997M01	65.07	835.47	2941.00	3882.00	4.84	104.86
1997M02	63.98	737.15	2745.00	3570.00	5.08	98.71
1997M03	70.48	696.59	3466.00	3564.00	4.35	99.75
1997M04	63.50	644.03	2635.00	3180.00	1.22	91.57
1997M05	63.98	697.34	3045.00	3503.00	5.90	102.35
1997M06	62.84	645.30	2825.00	3347.00	5.16	98.22
1997M07	64.17	659.33	2988.00	3553.00	3.77	101.94
1997M08	63.46	675.05	2819.00	3060.00	5.86	92.65
1997M09	64.26	682.06	3007.00	3175.00	6.71	96.20
1997M10	64.55	728.94	3014.00	3586.00	6.25	102.25
1997M11	66.02	711.84	2600.00	3299.00	6.13	89.35
1997M12	69.96	676.18	2913.00	3717.00	8.21	94.77
1998M01	70.24	593.12	2949.00	3575.00	28.70	92.88
1998M02	68.49	551.79	2944.00	3703.00	9.70	97.06
1998M03	73.18	523.03	3241.00	3716.00	8.75	95.06
1998M04	66.63	530.97	2714.00	3585.00	6.73	94.53

1998M05	66.73	564.00	2518.00	3748.00	6.75	93.90
1998M06	66.26	527.25	2485.00	3162.00	6.42	85.23
1998M07	66.59	540.73	2781.00	3922.00	6.02	100.66
1998M08	66.45	533.82	2985.00	3410.00	7.59	96.24
1998M09	66.30	586.79	2673.00	3692.00	8.41	96.00
1998M10	64.55	561.49	2609.00	3445.00	8.42	93.79
1998M11	69.48	503.44	2775.00	3484.00	8.00	90.08
1998M12	72.95	442.99	2786.00	3533.00	8.33	86.62
1999M01	73.85	481.19	2743.00	3445.00	10.04	83.79
1999M02	70.91	456.56	2854.00	3282.00	8.86	86.54
1999M03	76.51	545.74	3278.00	3693.00	8.49	91.12
1999M04	69.77	672.08	2735.00	3328.00	8.02	86.90
1999M05	71.67	689.47	2672.00	3657.00	8.76	88.31
1999M06	69.44	700.55	2764.00	3673.00	8.10	92.71
1999M07	70.72	811.62	3143.00	4207.00	8.21	103.94
1999M08	71.29	878.35	3169.00	4175.00	9.38	103.02
1999M09	71.14	973.95	3170.00	4629.00	9.67	109.62
1999M10	69.96	964.25	3138.00	4147.00	10.95	104.14
1999M11	72.14	1051.10	2937.00	4117.00	8.07	97.78
1999M12	78.83	1087.55	3068.00	4615.00	7.74	97.46
2000M01	77.46	1097.94	2748.00	3879.00	7.87	85.56
2000M02	76.70	1184.09	3404.00	4344.00	10.31	101.02
2000M03	82.82	1198.25	3860.00	4871.00	9.39	105.42
2000M04	74.28	1023.34	3310.00	4401.00	6.79	103.82
2000M05	75.94	1197.32	3577.00	4371.00	7.48	104.67
2000M06	73.52	1323.75	3455.00	4028.00	11.08	101.79
2000M07	74.23	1260.95	3526.00	4487.00	7.77	107.95
2000M08	74.75	1343.80	3670.00	3993.00	13.06	102.51
2000M09	75.27	1472.12	3848.00	4249.00	10.32	107.57
2000M10	74.61	1455.51	3719.00	4264.00	9.07	107.00
2000M11	77.41	1512.47	3604.00	4698.00	9.28	107.25
2000M12	81.59	1181.85	3657.00	3976.00	8.76	93.56
2001M01	80.78	1207.71	3666.00	4007.00	9.89	94.99

2001M02	78.78	1267.18	3695.00	3457.00	8.51	90.78
2001M03	84.05	1166.45	4309.00	4625.00	7.78	106.29
2001M04	76.13	1200.53	3115.00	4094.00	7.49	94.70
2001M05	77.12	1292.57	3629.00	4674.00	8.03	107.66
2001M06	75.46	1267.73	3612.00	4017.00	7.24	101.10
2001M07	76.13	1169.12	3433.00	4923.00	7.19	109.76
2001M08	76.98	1216.33	3647.00	4372.00	6.94	104.17
2001M09	76.74	1192.58	3702.00	3902.00	7.30	99.08
2001M10	76.98	995.46	3718.00	4093.00	7.40	101.47
2001M11	79.26	897.07	3576.00	4158.00	6.97	97.58
2001M12	84.05	887.42	3250.00	4079.00	7.08	87.19
2002M01	83.96	925.63	4253.00	4243.00	6.63	101.19
2002M02	80.83	972.86	3535.00	3759.00	6.73	90.24
2002M03	87.42	1152.20	4141.00	4433.00	6.97	98.08
2002M04	79.26	1244.02	4035.00	4207.00	6.58	103.99
2002M05	80.30	1258.81	4080.00	5181.00	6.90	115.32
2002M06	78.88	1199.06	3963.00	4251.00	6.04	104.13
2002M07	81.54	1255.67	4583.00	4874.00	5.75	115.98
2002M08	81.73	1301.25	4522.00	4861.00	5.72	114.81
2002M09	81.54	1369.92	4484.00	5086.00	5.75	117.37
2002M10	82.39	1331.61	4752.00	5593.00	5.73	125.56
2002M11	82.53	1196.25	4049.00	5072.00	5.45	110.51
2002M12	89.23	1342.56	3985.00	4972.00	5.58	100.39
2003M01	89.61	1474.81	4850.00	5571.00	5.66	116.30
2003M02	86.47	1569.55	4286.00	4631.00	5.71	103.12
2003M03	92.55	1446.38	5151.00	5891.00	5.86	119.31
2003M04	82.58	1207.65	4314.00	5764.00	4.87	122.04
2003M05	85.43	1226.99	4696.00	6175.00	4.87	127.25
2003M06	84.15	1303.98	4398.00	5727.00	4.91	120.32
2003M07	86.90	1321.85	4637.00	5784.00	4.90	119.92
2003M08	86.43	1363.37	4516.00	5785.00	4.83	119.19
2003M09	87.66	1232.46	5481.00	6305.00	4.50	134.45
2003M10	87.52	1316.78	5609.00	7019.00	4.64	144.29

2003M11	89.32	1325.54	4902.00	6467.00	4.38	127.28
2003M12	95.87	1365.45	6120.00	7450.00	4.40	141.54
2004M01	96.77	1427.10	5216.00	6898.00	4.43	125.18
2004M02	93.64	1417.91	6227.00	6844.00	4.33	139.59
2004M03	100.00	1515.65	7863.00	8034.00	4.37	158.97
2004M04	100.00	1480.99	5643.00	6987.00	4.29	126.30
2004M05	100.00	1702.46	5963.00	8073.00	4.30	140.36
2004M06	100.00	1617.64	6068.00	8717.00	4.35	147.85
2004M07	100.00	1746.44	5819.00	7872.00	4.31	136.91
2004M08	100.00	1950.09	5983.00	8132.00	4.41	141.15
2004M09	100.00	1919.99	6919.00	9420.00	4.45	163.39
2004M10	100.00	2145.88	6519.00	8989.00	4.63	155.08
2004M11	100.00	1905.09	7086.00	9358.00	5.62	164.44
2004M12	100.00	1719.20	7357.00	10457.00	5.28	178.14
2005M01	100.00	1876.73	8194.00	11009.00	4.72	192.03
2005M02	100.00	1946.25	8046.00	10357.00	4.76	184.03
2005M03	100.00	2225.13	10155.00	12369.00	4.72	225.24
2005M04	99.10	2215.05	7680.00	11336.00	4.77	191.89
2005M05	103.10	2079.33	7977.00	13232.00	4.99	205.71
2005M06	104.00	2348.85	7893.00	11803.00	5.10	189.38
2005M07	102.40	2454.20	7492.00	11509.00	5.02	185.56
2005M08	104.10	2699.14	8571.00	12760.00	5.02	204.91
2005M09	104.40	2707.45	8457.00	12896.00	5.05	204.53
2005M10	107.30	2608.22	8622.00	11883.00	5.12	191.10
2005M11	104.60	2514.02	7293.00	11326.00	5.79	178.00
2005M12	116.80	2578.31	9235.00	12390.00	6.00	185.15
2006M01	118.50	2768.69	9168.00	12894.00	6.83	186.18
2006M02	112.40	2647.01	9055.00	11535.00	6.95	183.19
2006M03	126.70	2709.89	11561.00	14314.00	6.58	204.22
2006M04	108.80	3056.56	8625.00	12924.50	5.62	198.07
2006M05	114.80	3115.52	10109.70	15106.00	5.54	219.65
2006M06	114.20	3145.13	10420.00	14400.10	5.73	217.34
2006M07	117.60	3368.54	10600.10	14985.40	5.86	217.56

2006M08	114.30	3341.97	10769.50	15326.70	6.06	228.31
2006M09	118.20	2858.12	10756.90	17351.10	6.33	237.80
2006M10	117.70	2634.90	9928.60	17512.40	6.75	233.14
2006M11	125.50	2607.54	9979.40	16381.20	6.69	210.04
2006M12	132.80	2722.71	10834.50	15679.60	8.63	199.65
2007M01	134.90	2367.73	10967.00	14446.90	8.18	188.39
2007M02	127.80	2542.87	10561.20	14484.70	7.16	195.98
2007M03	144.90	2667.95	12862.40	17136.60	14.07	207.03
2007M04	128.20	2744.03	11326.80	18370.60	8.33	231.65
2007M05	136.86	2655.56	12455.70	21149.50	6.96	245.55
2007M06	136.74	2779.56	12101.00	20016.00	2.42	234.88
2007M07	136.65	2977.47	12513.30	21128.60	0.73	246.20
2007M08	134.60	2862.54	12640.60	20365.90	6.31	245.22
2007M09	133.98	3102.55	12521.40	18217.50	6.41	229.42
2007M10	140.72	3246.01	14674.70	21832.60	6.03	259.43
2007M11	137.92	3599.69	12909.30	22104.10	6.98	253.86
2007M12	150.73	3527.12	14625.50	20116.90	7.50	230.49
2008M01	152.52	3575.83	14889.10	22844.40	6.69	247.40
2008M02	149.32	3724.64	15116.20	20804.40	7.06	240.56
2008M03	161.88	4109.92	17254.00	23573.70	7.37	252.20
2008M04	142.33	4365.33	18460.40	30316.90	6.11	342.71
2008M05	146.75	5171.75	18686.60	29443.60	6.62	327.98
2008M06	148.38	5631.69	19180.90	28950.60	7.75	324.39
2008M07	144.30	5677.98	19030.40	31625.50	8.76	351.05
2008M08	141.87	4919.52	17759.30	33523.20	9.10	361.49
2008M09	148.59	4524.05	15789.10	31135.70	10.52	315.81
2008M10	146.17	3535.80	14130.80	25869.30	9.90	273.65
2008M11	139.65	2648.14	11163.30	23488.20	7.57	248.13
2008M12	148.28	2020.10	13368.20	19456.30	5.92	221.36
2009M01	144.37	2144.56	12869.00	18228.20	4.18	215.40
2009M02	138.51	2055.52	11940.90	15062.20	4.16	194.96
2009M03	153.53	2407.13	12916.30	16596.60	4.17	192.22
2009M04	139.59	2517.58	12475.70	19340.70	3.28	227.93

2009M05	144.27	2819.83	12316.50	20036.40	3.17	224.25
2009M06	145.74	3302.59	13606.30	23055.00	3.21	251.55
2009M07	146.72	3136.03	14341.30	21723.50	3.21	245.81
2009M08	149.42	3461.09	13586.30	22448.70	3.22	241.16
2009M09	151.01	3312.26	14624.20	21527.20	3.31	239.40
2009M10	149.65	3461.10	14806.00	25935.80	3.17	272.25
2009M11	148.50	3611.89	14932.70	24996.50	3.19	268.89
2009M12	162.38	3491.65	16493.50	28251.40	3.24	275.56
2010M01	163.62	3541.88	15557.10	25267.00	3.23	249.51
2010M02	157.52	3461.46	15757.70	26163.80	3.17	266.14
2010M03	176.47	3607.99	20254.10	29626.90	3.51	282.65
2010M04	157.85	3744.14	18139.10	31674.90	3.49	315.59
2010M05	156.54	3457.51	17282.00	29747.10	3.83	300.42
2010M06	156.55	3479.77	20667.10	28648.60	5.16	315.01
2010M07	161.30	3492.91	16954.50	29669.90	5.54	289.05
2010M08	156.10	3533.47	17750.40	27107.70	5.17	287.37
2010M09	160.30	3503.86	18984.20	29511.80	5.50	302.53
2010M10	166.60	3629.80	19080.80	32461.70	6.39	309.38
2010M11	158.00	3793.46	22575.00	28842.30	6.81	325.43
2010M12	175.60	4068.37	23349.40	31511.10	6.67	312.42
2011M01	175.90	4205.30	22691.80	33353.60	6.54	318.62
2011M02	168.00	4442.32	23243.50	32973.40	6.69	334.62
2011M03	193.10	4888.11	30418.50	34267.00	7.15	334.98
2011M04	166.20	5162.95	23469.52	36595.86	6.58	361.40
2011M05	166.20	4856.74	26521.93	45254.24	7.15	431.87
2011M06	171.40	4747.57	26536.13	40849.47	7.38	393.15
2011M07	167.20	4791.52	26426.54	41105.88	7.51	403.90
2011M08	161.40	4548.23	24768.35	39984.69	7.97	401.20
2011M09	164.30	4812.40	26561.20	39756.07	8.11	403.64
2011M10	158.30	4920.06	23632.02	41175.06	8.26	409.39
2011M11	167.50	5340.76	23269.71	39102.48	8.58	372.37
2011M12	180.30	5488.30	25365.69	40044.06	9.04	362.78
2012M01	177.60	5475.69	25379.05	42952.47	8.92	384.75

2012M02	175.20	5540.75	25194.42	40118.54	8.81	372.79
2012M03	187.60	5927.55	28839.37	42380.69	9.17	379.64
2012M04	164.10	5892.63	23791.86	38171.04	8.62	377.59
2012M05	170.30	5659.74	24821.44	42187.32	8.27	393.47
2012M06	168.00	5083.60	24924.26	36157.37	8.14	363.58
2012M07	167.10	5372.19	23099.88	40619.44	8.05	381.32
2012M08	164.70	5849.31	23134.47	37307.27	7.99	366.98
2012M09	163.10	5800.66	24902.00	42051.45	7.92	410.51
2012M10	171.60	5475.37	24032.90	44243.75	8.00	397.88
2012M11	165.80	5536.01	23250.94	40454.01	8.04	384.23
2012M12	179.30	5525.53	25457.54	43050.57	8.05	382.09
2013M01	182.00	5705.06	25775.19	44754.68	8.00	387.53
2013M02	176.20	5786.01	26668.77	40791.99	7.80	382.86
2013M03	194.20	5580.74	30541.41	40947.79	7.90	368.12
2013M04	166.50	5375.04	24524.54	41577.15	7.53	397.01
2013M05	166.00	5467.56	24922.94	43987.10	7.29	415.12
2013M06	164.90	5817.69	23998.41	35304.36	7.24	359.63
2013M07	171.40	6289.39	25835.08	38326.45	7.76	374.34
2013M08	165.40	6830.35	26337.98	37026.02	9.90	383.10
2013M09	167.50	6928.11	28135.90	34258.24	9.97	372.50
2013M10	169.60	6499.62	27480.13	38075.02	9.03	386.53
2013M11	163.60	6432.65	24201.83	33772.92	8.45	354.37
2013M12	179.50	6534.90	26393.06	36580.09	8.16	350.83
2014M01	184.00	6353.32	26891.58	36346.32	8.19	343.68
2014M02	172.70	6528.65	25353.24	33665.55	8.21	341.74
2014M03	193.30	6343.00	30341.03	41294.46	8.37	370.59
2014M04	172.70	6333.82	25827.54	35795.64	8.36	356.82
2014M05	175.30	6274.31	28019.24	39058.85	8.00	382.65
2014M06	172.00	6471.05	25926.63	38352.39	8.08	373.72
2014M07	173.00	6319.91	25815.70	40068.01	8.27	380.83
2014M08	166.20	6092.56	26825.30	37472.78	7.98	386.87
2014M09	171.80	5838.13	28889.65	43341.75	7.80	420.44
2014M10	165.10	5283.91	25914.72	39468.76	7.94	396.02

2014M11	172.10	4746.68	26503.04	42722.49	7.83	402.24
2014M12	185.90	3797.15	26172.79	35333.27	8.11	330.86
2015M01	189.20	2948.32	24415.17	32265.37	7.89	299.58
2015M02	181.00	3407.19	22008.04	28725.38	7.69	280.30
2015M03	198.10	3299.23	24034.18	35428.72	7.58	300.17
2015M04	177.90	3603.29	22137.21	33506.51	7.44	312.78
2015M05	179.70	3988.14	22529.08	32837.76	7.47	308.11
2015M06	179.30	3914.66	22323.72	33536.23	7.11	311.54
2015M07	180.50	3464.24	23281.21	36372.07	7.04	330.49
2015M08	176.60	2975.11	21582.68	33981.73	7.07	314.63
2015M09	178.20	3065.09	21869.35	32035.32	7.14	302.50
2015M10	181.40	3055.95	21456.11	31148.33	6.71	289.99
2015M11	166.30	2848.76	19560.92	29896.40	6.78	297.40
2015M12	184.20	2434.73	22593.35	34096.49	6.73	307.76
2016M01	186.20	2013.42	21199.03	28866.53	6.81	268.88
2016M02	184.50	2118.95	20845.72	27418.98	6.77	261.60
2016M03	198.70	2503.95	22911.74	27310.28	6.93	252.75
2016M04	175.50	2708.63	20891.17	25805.61	6.47	266.08
2016M05	182.00	3075.42	22396.43	28349.74	6.44	278.83
2016M06	183.20	3208.66	22655.37	30841.90	6.33	292.02
2016M07	175.90	2972.33	21682.32	29349.71	6.36	290.12
2016M08	175.30	3001.48	21596.71	29348.91	6.40	290.62
2016M09	179.50	3007.39	22905.57	31760.37	6.50	304.55
2016M10	178.00	3290.46	23349.36	34486.69	6.40	324.92
2016M11	175.60	3057.64	20058.96	33480.00	6.36	304.89
2016M12	184.00	3572.16	24037.51	34493.46	6.41	318.10
2017M01	192.30	3652.61	22285.58	31924.26	6.44	281.90
2017M02	182.30	3647.70	25543.50	33231.40	6.50	322.41
2017M03	214.45	2891.07	29144.68	39668.25	5.95	2891.07
2017M04	188.85	750.70	24569.03	38092.16	5.93	750.70
2017M05	200.92	911.06	23947.15	37927.45	6.04	911.06
2017M06	192.07	859.35	23018.55	36822.23	6.08	859.35
2017M07	189.98	883.95	22257.63	34277.89	6.06	883.95

2017M08	196.58	790.64	23177.45	36054.54	5.90	790.69
2017M09	198.19	843.49	28367.44	37918.26	5.88	843.49
2017M10	197.22	770.63	22852.67	37454.46	5.87	770.63
2017M11	202.53	1227.09	26087.14	40416.96	5.87	1227.09
2017M12	209.78	956.89	27676.06	41909.73	5.91	956.89
2018M01	212.84	1225.37	24956.33	40661.70	5.88	1225.37
2018M02	205.59	817.58	25834.11	37813.53	5.93	817.58
2018M03	202.58	783.59	24878.58	39100.21	5.95	783.59

Table E.3: Macroeconomic Variables (Rs. Billion) - III

Year	GP (US $ Million)	FII	NIFTY Return	SENSEX Return	MC BSE	TO BSE	P.E RATIO
1995M04	4850	1.87	-1.22	-1.32	4553.15	20.24	29.84
1995M05	4740	2.03	-5.10	-4.56	4567.81	23.48	28.51
1995M06	4740	3.61	3.45	4.07	4622.38	42.80	23.16
1995M07	4697	6.48	-1.29	-0.05	4651.45	48.36	19.15
1995M08	4705	5.48	0.78	2.04	5036.30	41.49	18.87
1995M09	4770	4.10	-0.68	-0.19	5308.19	50.19	18.67
1995M10	4960	3.21	4.00	3.88	5186.23	46.57	18.83
1995M11	5035	1.91	-10.39	-10.09	4351.07	38.50	16.45
1995M12	5043	4.12	-2.85	-3.53	4472.97	38.17	15.76
1996M01	5289	7.38	-3.11	-2.64	4363.96	43.25	15.34
1996M02	5454	16.13	15.63	14.31	4997.05	67.46	17.70
1996M03	5158	10.89	-1.72	-2.30	5264.76	40.12	17.29
1996M04	5310	14.73	9.18	8.19	5859.19	70.52	18.39
1996M05	5239	10.36	2.49	3.68	5186.40	91.56	19.30
1996M06	5070	10.42	4.54	4.68	5308.15	120.41	20.17
1996M07	5114	8.74	-5.38	-6.25	5015.38	148.63	18.58
1996M08	5175	1.48	-5.92	-5.83	4971.13	76.09	14.89
1996M09	5112	3.65	-2.98	-1.71	4768.05	62.48	13.83
1996M10	5157	3.66	-8.04	-6.79	4558.05	88.69	12.71
1996M11	5102	4.03	-3.97	-3.66	4167.50	65.95	12.00

1996M12	5060	4.22	-3.56	-4.13	4392.31	65.56	11.51
1997M01	4840	3.40	15.94	16.84	4582.61	160.05	13.46
1997M02	4885	4.24	0.93	1.23	4846.24	128.68	13.52
1997M03	4695	4.94	8.77	8.99	4639.15	164.22	14.57
1997M04	4788	6.25	-3.77	-2.15	5020.82	122.55	14.19
1997M05	4785	8.89	1.06	1.61	5063.91	114.39	14.27
1997M06	4641	14.04	8.01	6.96	5884.96	181.77	15.20
1997M07	4469	10.03	6.55	6.36	5953.46	212.27	16.32
1997M08	4512	4.94	0.72	0.47	5508.83	183.43	15.80
1997M09	4442	5.99	-6.79	-7.75	5477.28	189.11	14.66
1997M10	4400	6.42	1.23	1.19	5261.42	167.06	14.89
1997M11	4136	-2.90	-8.65	-9.52	4935.73	153.26	13.50
1997M12	3995	-1.82	-1.92	-2.67	5037.16	180.74	13.04
1998M01	4009	-3.75	-0.65	-1.21	4695.13	173.81	13.23
1998M02	3995	6.29	-2.48	-2.01	5263.57	164.97	13.55
1998M03	3995	4.72	11.38	12.16	5603.25	233.10	15.29
1998M04	4210	1.69	7.29	7.80	5802.38	266.84	16.55
1998M05	4143	-5.57	-4.74	-4.93	5618.49	234.40	15.74
1998M06	4215	-8.96	-15.02	-15.20	4854.61	224.96	13.32
1998M07	4271	1.05	-1.13	-1.38	4834.20	212.42	12.91
1998M08	4189	-3.91	-8.02	-8.66	4648.87	182.11	11.46
1998M09	4234	1.11	3.16	3.40	4797.11	276.47	11.50
1998M10	4302	-5.52	-7.06	-7.26	4527.79	223.71	10.27
1998M11	4330	0.47	1.18	1.64	4467.28	202.20	10.91
1998M12	4295	3.07	0.96	1.15	4770.10	266.87	11.65
1999M01	4330	3.70	11.06	11.17	5024.51	325.16	12.95
1999M02	4367	3.54	0.51	0.43	5042.33	311.42	12.99
1999M03	4260	2.04	11.38	12.16	5453.61	393.44	14.59
1999M04	4435	8.15	-6.27	-6.49	4882.29	270.03	13.77
1999M05	4250	15.24	11.59	12.48	5609.65	362.35	15.76
1999M06	4120	5.04	5.00	4.81	5847.88	332.39	16.53
1999M07	4060	15.08	11.18	11.30	6489.32	466.39	18.40
1999M08	4045	-0.12	3.74	3.02	7109.56	499.97	19.87

1999M09	4150	-8.78	3.06	1.33	7045.68	465.78	20.41
1999M10	4645	-7.35	3.57	2.34	6734.62	576.99	21.01
1999M11	4663	11.97	-4.84	-5.11	7096.13	491.21	19.99
1999M12	4530	15.71	5.24	4.67	8033.53	784.48	20.91
2000M01	4533	1.84	11.94	12.59	9273.83	731.64	23.34
2000M02	4700	27.27	4.90	4.50	10292.57	1018.42	24.32
2000M03	4390	13.60	-4.80	-6.88	9128.42	850.63	22.69
2000M04	4453	24.38	-8.51	-6.77	7559.14	446.01	27.79
2000M05	4313	1.72	-10.64	-13.30	7027.77	578.91	27.68
2000M06	4108	-9.86	10.60	9.93	7932.30	862.77	29.39
2000M07	4051	-15.69	-0.45	-0.60	7208.84	803.46	28.51
2000M08	4086	16.26	-6.53	-6.82	7666.42	925.63	25.27
2000M09	4178	-4.54	1.50	1.99	6926.57	1144.32	24.47
2000M10	4749	0.76	-12.37	-13.52	6534.37	763.04	19.57
2000M11	4615	10.90	3.24	2.84	6992.30	869.71	19.90
2000M12	4473	-4.62	4.10	3.90	6911.62	991.99	20.84
2001M01	4509	39.72	1.98	1.74	7366.31	1148.49	21.42
2001M02	4707	15.74	4.17	3.80	7161.73	1014.27	22.30
2001M03	4393	22.05	-11.48	-11.66	5715.53	451.70	19.72
2001M04	4412	16.95	-8.07	-8.41	5677.29	238.76	18.09
2001M05	4398	10.31	3.85	3.62	5959.38	318.68	18.86
2001M06	4399	8.09	-4.51	-4.84	5532.30	254.51	17.49
2001M07	4382	7.73	-2.64	-2.68	5315.76	172.44	16.28
2001M08	4448	2.70	-0.83	-1.25	5230.36	174.44	16.69
2001M09	4617	-2.29	-11.19	-11.70	4562.63	215.93	15.20
2001M10	4691	6.05	0.47	0.52	4818.51	219.22	14.29
2001M11	4602	1.62	8.14	7.86	5357.24	244.02	14.89
2001M12	4581	2.79	4.29	4.76	5323.28	300.33	15.59
2002M01	4895	3.70	1.05	1.16	5443.97	391.69	16.35
2002M02	4965	20.24	4.69	5.23	5967.16	285.72	17.28
2002M03	4985	4.84	1.86	1.48	6122.24	257.19	17.55
2002M04	5050	-0.82	-3.33	-4.07	6255.87	288.75	16.83
2002M05	5235	-1.54	-3.65	-3.85	6050.65	281.38	16.19

2002M06	5311	-1.83	-1.29	-1.39	6377.53	233.20	15.92
2002M07	5188	3.05	-2.93	-1.29	5840.42	267.24	15.34
2002M08	5129	1.92	-5.52	-5.03	6053.03	237.80	13.63
2002M09	5243	4.22	0.97	1.06	5702.73	244.10	13.13
2002M10	5298	-4.44	-3.24	-4.40	5637.50	276.41	12.68
2002M11	5241	3.42	3.89	3.68	6012.89	259.81	13.22
2002M12	5253	4.57	8.24	8.42	6281.97	305.82	14.37
2003M01	5326	10.88	-0.05	0.36	6114.72	308.98	14.43
2003M02	5469	4.33	-1.64	-1.47	6198.73	234.61	14.22
2003M03	5589	2.93	-3.74	-3.76	5721.98	202.65	13.74
2003M04	5623	5.72	-5.05	-3.77	5725.26	208.23	13.21
2003M05	5724	12.33	-0.19	-0.11	6609.82	225.10	13.21
2003M06	5864	25.93	10.94	11.65	7343.89	249.33	14.61
2003M07	5962	24.96	7.62	8.23	7759.96	329.76	14.73
2003M08	5569	20.58	9.66	8.52	9051.93	363.34	15.33
2003M09	5863	40.48	8.56	8.47	9330.87	446.98	15.76
2003M10	5423	69.40	10.01	9.91	10004.94	526.31	17.07
2003M11	5632	32.82	4.91	4.40	10658.53	450.29	16.28
2003M12	5763	62.91	10.13	9.56	12733.61	548.16	17.30
2004M01	6150	24.93	9.54	9.76	12068.54	656.20	19.39
2004M02	5950	31.83	-3.01	-2.14	11962.21	514.64	18.71
2004M03	6160	88.12	-3.73	-3.67	12012.07	507.86	18.55
2004M04	5710	42.08	3.87	3.49	12553.47	448.64	19.31
2004M05	6865	-31.51	-11.27	-10.40	10231.29	459.38	17.28
2004M06	6080	5.11	-8.17	-7.32	10472.58	369.90	14.76
2004M07	5995	12.93	4.11	3.09	11355.89	394.49	14.82
2004M08	6265	28.50	3.01	3.44	12165.67	381.95	15.28
2004M09	6270	28.16	4.75	5.43	13093.18	396.03	16.10
2004M10	6435	39.52	6.09	5.13	13371.90	346.08	17.31
2004M11	6745	63.45	4.40	4.55	15395.95	357.42	18.04
2004M12	6450	58.90	7.90	7.27	16859.89	502.26	18.15
2005M01	6110	13.24	-2.18	-1.36	16615.32	438.88	16.11
2005M02	6260	74.94	4.53	4.57	17309.40	496.86	15.75

2005M03	6210	78.86	1.40	1.28	16984.28	595.28	16.05
2005M04	6230	-9.46	-5.21	-4.49	16357.66	378.09	15.25
2005M05	6005	-5.87	0.76	1.62	17832.21	433.59	14.94
2005M06	6235	56.99	6.59	6.84	18503.77	584.79	15.75
2005M07	6250	73.91	4.80	5.93	19871.70	618.99	16.01
2005M08	6310	40.85	5.40	5.31	21239.01	759.33	16.00
2005M09	6805	32.58	6.54	7.07	22543.78	812.91	17.11
2005M10	7000	-38.08	-0.99	-0.63	20656.12	591.02	16.77
2005M11	6900	45.59	3.53	4.03	23230.65	526.94	16.75
2005M12	6950	96.15	7.69	7.13	24893.86	773.65	18.07
2006M01	8110	51.77	4.33	4.12	26161.94	793.16	18.60
2006M02	8090	78.59	4.39	5.77	26955.43	700.70	18.64
2006M03	8240	63.48	7.17	7.60	30221.91	1187.65	20.05
2006M04	9325	7.22	7.96	8.15	32555.65	874.87	21.35
2006M05	9805	-89.30	-1.62	-1.21	28420.50	958.20	20.41
2006M06	8800	17.82	-15.20	-14.35	27216.78	720.13	17.90
2006M07	9000	10.73	6.08	6.26	27121.44	546.98	19.02
2006M08	9350	39.98	6.90	7.08	29937.80	630.84	19.60
2006M09	9065	46.24	5.64	6.46	31856.80	716.29	20.73
2006M10	8910	58.05	4.50	5.00	33706.76	696.27	21.56
2006M11	9315	70.29	6.01	6.16	35773.08	1018.40	22.07
2006M12	9195	-18.69	1.07	1.58	36243.57	855.12	22.51
2007M01	9295	31.85	3.24	2.61	37797.42	876.05	22.73
2007M02	9865	42.79	1.16	1.13	34892.14	888.44	21.56
2007M03	9445	20.57	-8.63	-9.09	35450.41	780.28	19.84
2007M04	9150	47.53	5.79	4.82	38283.37	786.93	20.75
2007M05	8720	32.42	6.01	5.04	40745.52	988.21	20.84
2007M06	8720	72.10	0.90	1.26	41682.72	952.68	20.67
2007M07	8660	195.15	5.97	6.41	45297.72	1250.54	21.78
2007M08	8765	-64.76	-3.86	-3.11	45380.06	1060.42	19.99
2007M09	8950	198.23	8.34	8.57	52029.55	1231.44	21.69
2007M10	9691	163.76	17.10	15.30	63320.93	1990.89	24.86
2007M11	10340	-30.52	5.35	4.10	63854.75	1706.23	25.44

2007M12	10311	50.55	3.74	2.95	71699.85	1635.16	26.94
2008M01	11291	-130.01	-3.47	-2.53	57960.79	1856.42	25.53
2008M02	11888	77.84	-9.64	-8.27	58884.48	1219.75	22.23
2008M03	12632	13.54	-8.31	-10.66	51380.15	1109.91	20.18
2008M04	11810	14.76	2.78	2.86	57942.93	1154.54	20.71
2008M05	12143	-33.78	2.59	4.02	54288.79	1216.70	20.66
2008M06	12369	-104.29	-11.23	-11.50	43750.22	1136.05	18.22
2008M07	13055	-16.54	-7.60	-8.54	47325.45	1239.16	17.06
2008M08	11855	-28.08	7.09	7.33	47788.65	999.24	18.25
2008M09	12214	-75.49	-4.76	-5.29	41653.88	1080.90	17.36
2008M10	12766	-134.61	-23.69	-24.34	29972.61	782.27	13.19
2008M11	12207	-26.07	-11.70	-10.39	28189.65	636.94	11.88
2008M12	12923	22.08	2.15	0.63	31447.68	808.66	12.16
2009M01	13508	-38.97	-1.43	-1.72	29972.61	705.09	12.21
2009M02	14781	-17.59	-1.23	-1.74	28628.73	543.30	12.82
2009M03	15255	5.22	-0.60	-2.10	30860.76	697.89	12.68
2009M04	14501	81.23	19.90	21.30	35869.79	889.43	15.23
2009M05	14610	211.15	17.80	19.57	48650.46	1285.42	17.88
2009M06	14620	43.32	12.09	13.31	47499.35	1591.95	19.75
2009M07	14749	119.87	-2.10	-1.00	51399.43	1389.86	19.10
2009M08	14996	38.47	5.25	5.33	52856.58	1223.19	20.08
2009M09	15723	203.35	6.30	5.99	57083.38	1242.20	21.20
2009M10	15864	85.58	2.77	2.98	53759.21	1140.07	21.66
2009M11	17040	57.28	-0.81	-0.84	57952.10	1051.42	21.23
2009M12	17138	106.01	2.95	2.43	60813.09	980.82	21.82
2010M01	16684	-24.35	1.11	1.00	59257.26	1170.84	21.99
2010M02	16535	27.34	-6.14	-6.24	59049.30	825.10	19.97
2010M03	16603	199.77	7.00	6.91	61656.20	997.79	21.05
2010M04	16679	89.67	2.25	2.17	62831.97	939.29	21.28
2010M05	17997	-86.47	-4.57	-4.72	60912.65	866.80	19.96
2010M06	18741	94.47	2.67	2.70	63940.02	924.93	20.57
2010M07	18300	170.18	3.31	3.17	65107.78	929.57	21.20
2010M08	18490	103.97	1.82	1.84	65620.26	1128.82	21.61

2010M09	19087	295.07	6.49	6.47	71258.07	1088.85	22.99
2010M10	19493	246.34	4.90	4.63	72249.08	1184.97	23.89
2010M11	20174	178.74	-0.67	-0.61	70678.45	1060.00	23.03
2010M12	20496	21.70	-1.39	-0.99	72967.26	815.60	22.93
2011M01	20212	-61.47	-3.16	-3.21	65952.79	698.58	22.00
2011M02	20345	-38.78	-6.60	-6.49	63430.73	688.30	19.67
2011M03	20842	94.17	2.55	2.33	68390.84	708.96	20.04
2011M04	21374	32.49	5.43	5.38	69080.90	696.26	21.05
2011M05	22123	-25.46	-5.94	-5.78	67318.69	594.94	19.59
2011M06	22344	55.13	-0.36	-0.53	67309.47	593.37	19.37
2011M07	22662	56.21	2.26	2.13	66172.73	593.37	19.60
2011M08	26117	-89.44	-9.29	-9.29	60616.26	533.01	18.36
2011M09	27520	28.53	-1.20	-1.14	59551.67	543.60	18.35
2011M10	26680	27.98	0.89	0.77	62401.55	435.15	18.20
2011M11	28545	-39.29	-1.10	-0.94	56722.55	438.72	17.61
2011M12	28069	-0.17	-4.43	-4.23	53486.45	394.92	16.92
2012M01	27573	113.39	2.88	2.49	60593.47	525.71	17.09
2012M02	28069	251.92	9.94	9.04	63566.97	696.17	18.32
2012M03	27918	87.87	-2.04	-2.36	62149.12	624.99	17.85
2012M04	28478	-12.18	-0.83	-0.76	61776.85	423.05	17.63
2012M05	28845	-13.32	-5.48	-5.13	58174.22	416.55	16.49
2012M06	29779	40.72	2.17	2.08	61556.47	443.15	16.37
2012M07	29468	78.00	2.91	2.83	60813.89	444.75	16.71
2012M08	30141	98.66	2.06	2.17	60807.98	427.89	16.68
2012M09	31673	209.38	2.92	3.08	65590.50	455.01	17.04
2012M10	31056	103.46	3.71	3.29	64710.51	510.30	17.31
2012M11	31548	110.96	-0.16	-0.26	67387.13	477.83	16.90
2012M12	30833	234.90	3.72	3.71	69218.15	503.77	17.43
2013M01	30520	224.16	2.24	2.63	70245.77	566.62	17.88
2013M02	29963	220.95	-2.15	-2.07	65380.38	421.38	17.43
2013M03	29514	110.56	-1.89	-1.63	63878.87	397.45	17.19
2013M04	27743	61.41	-1.43	-1.73	66457.85	409.80	16.85
2013M05	26769	207.84	6.40	6.12	66791.34	499.96	17.43

2013M06	27178	-93.74	-4.66	-4.20	64051.18	363.77	16.97
2013M07	26928	-63.10	2.20	3.03	62631.06	415.35	17.47
2013M08	30216	-58.05	-6.75	-5.42	60300.78	408.76	16.81
2013M09	30473	130.62	5.21	5.29	63861.34	398.98	17.27
2013M10	30710	183.24	4.94	4.41	68442.33	410.18	17.77
2013M11	30740	76.26	0.74	0.71	68104.75	407.68	17.53
2013M12	29904	157.16	1.93	1.63	70442.58	435.66	17.78
2014M01	29582	3.24	-0.38	-0.14	67443.98	496.73	17.78
2014M02	30211	29.59	-2.00	-2.02	68930.83	348.52	16.79
2014M03	29832	220.75	6.71	6.31	74152.96	621.25	17.87
2014M04	29329	79.23	3.79	3.46	74947.91	497.16	18.26
2014M05	28738	168.44	4.86	5.21	84078.34	921.22	17.94
2014M06	27427	112.60	6.49	6.24	90200.00	841.41	18.58
2014M07	28008	110.72	1.78	1.97	90102.70	751.19	18.52
2014M08	28080	68.29	1.44	1.30	92594.81	539.18	18.17
2014M09	26963	60.62	3.42	3.27	93822.49	823.11	18.52
2014M10	26991	3.87	-1.25	-1.02	96846.91	510.78	18.31
2014M11	26115	137.09	5.83	5.65	99825.64	678.92	19.21
2014M12	26678	-9.10	-1.27	-1.73	98363.77	671.35	18.84
2015M01	27403	180.63	2.50	2.01	103462.82	736.86	19.20
2015M02	27075	87.76	2.73	2.62	104666.61	784.09	19.68
2015M03	26168	102.28	-0.99	-4.54	101492.90	795.88	19.51
2015M04	26683	77.61	-1.62	1.71	99680.15	674.21	19.39
2015M05	27093	-4.75	-2.62	-2.44	103266.86	606.05	19.85
2015M06	26646	-58.01	-1.27	-1.05	101435.11	603.70	20.74
2015M07	25539	59.80	3.46	3.23	104793.96	702.54	22.50
2015M08	25729	-163.34	-2.00	-2.24	98279.30	611.68	21.85
2015M09	26246	-50.61	-5.96	-6.14	96481.22	519.27	20.58
2015M10	26577	51.04	4.57	5.08	98333.59	581.43	21.79
2015M11	25648	-50.81	-3.48	-3.70	98882.27	453.55	20.61
2015M12	25207	10.98	-1.08	-1.37	100377.34	617.41	19.88
2016M01	25998	-100.60	-3.42	-3.42	93921.33	635.76	18.49
2016M02	28252	-76.26	-4.46	-4.40	85831.45	571.58	17.48

2016M03	28794	256.13	4.86	4.74	94753.28	617.73	18.64
2016M04	28818	69.29	3.13	2.54	97105.39	491.74	19.27
2016M05	29639	25.61	1.10	0.99	99286.78	595.20	19.01
2016M06	29745	51.33	4.06	3.99	102855.49	607.40	19.52
2016M07	30942	109.93	3.84	3.73	108635.80	680.33	20.25
2016M08	31270	102.54	1.55	1.03	110994.23	740.84	20.59
2016M09	31178	100.64	1.69	1.80	110736.48	759.15	21.23
2016M10	30071	-50.50	-1.33	-1.76	114066.93	645.09	21.10
2016M11	29796	-173.55	-4.80	-4.58	107887.09	701.78	20.57
2016M12	27754	-86.24	-1.66	-1.29	106233.47	539.05	20.56
2017M01	28746	-13.73	3.35	3.01	112563.30	647.64	21.19
2017M02	29265	111.11	5.09	4.76	117593.67	683.30	21.86
2017M03	29566	336.86	2.66	2.85	121545.25	2891.07	22.37
2017M04	29514	-17.40	1.84	1.46	124849.75	750.70	22.63
2017M05	28986	109.30	2.42	2.44	125801.19	911.06	22.72
2017M06	29569	36.67	1.80	2.38	125968.12	859.35	22.85
2017M07	28592	45.92	2.53	2.36	132622.46	883.95	23.35
2017M08	29893	-118.24	0.52	-0.34	131897.63	790.64	23.77
2017M09	30428	-117.76	0.78	0.36	131813.53	843.49	23.79
2017M10	29945	-11.10	1.61	1.60	143915.46	770.63	24.16
2017M11	29720	157.98	1.84	3.08	145966.56	1227.09	24.62
2017M12	29209	-14.32	-0.02	0.09	151738.67	956.89	24.67
2018M01	30454	144.66	4.35	4.68	153209.36	1225.37	25.69
2018M02	30828	-118.34	-2.21	-2.01	147655.83	817.58	24.04
2018M03	30927	59.78	-2.85	-2.81	142249.97	783.59	24.67

Table E.4: BSE Indices Return I

S& P BSE INDICES RETURN					
Year	**Auto**	**Bankex**	**Basic Materials**	**Capital Goods**	**Consumer Discretionary Goods & Services**
2007M04	0.78148	7.32038	2.15342	7.04647	4.69915

2007M05	0.27147	10.52552	3.827613	12.88949	7.318129
2007M06	-5.44084	5.292119	4.350364	10.2687	-1.60631
2007M07	4.098684	1.732098	8.743902	8.31279	2.422847
2007M08	-1.13056	-3.55751	0.940349	0.77287	-3.03111
2007M09	9.311303	20.49259	17.79856	9.349157	9.656809
2007M10	3.280223	12.52548	16.15974	34.84697	7.658632
2007M11	-0.68402	2.022931	0.690342	-0.79787	1.441871
2007M12	3.619161	5.032895	9.779177	0.600946	17.00081
2008M01	-14.7327	-6.16649	-23.0043	-17.0469	-19.7644
2008M02	1.131717	-5.60188	5.170062	-1.63647	-2.62015
2008M03	-7.41533	-23.6918	-14.1908	-13.0928	-11.5994
2008M04	4.447298	14.27994	10.99314	-0.55514	7.696298
2008M05	-7.83411	-12.5298	0.888017	-5.6033	-8.93254
2008M06	-17.681	-23.3144	-20.9899	-23.3445	-22.2955
2008M07	2.618515	10.14929	0.764147	15.90278	4.204588
2008M08	8.743556	7.569812	-2.71969	1.735908	2.654162
2008M09	-8.15374	-7.57295	-21.914	-10.9829	-15.9622
2008M10	-26.9215	-22.6523	-35.8856	-33.6781	-29.8722
2008M11	-13.2208	-7.30039	-15.8606	-8.98155	-11.9279
2008M12	4.897964	17.41809	18.41362	8.200622	14.89873
2009M01	2.271026	-10.1655	-1.49637	-9.47039	-9.0246
2009M02	7.290529	-13.4684	-3.90097	-5.73298	-3.69061
2009M03	14.13452	5.916606	17.438	9.632379	8.126189
2009M04	14.25921	26.59225	15.82304	22.3123	15.79467
2009M05	31.79799	45.2614	42.27288	50.73672	42.49167
2009M06	-1.13174	-0.56851	-0.78625	7.34713	-2.74921
2009M07	25.34316	3.09664	15.05289	-1.57323	16.98558
2009M08	2.87993	-1.43094	-0.22067	4.407849	4.630748
2009M09	13.37171	18.10724	10.7934	4.608266	8.95608
2009M10	-5.35769	-5.27051	-5.07705	-6.42362	-7.79596
2009M11	11.24841	7.565209	12.59096	3.477537	5.411027
2009M12	5.973925	-0.11611	7.808947	5.971927	5.150326
2010M01	-6.4906	-3.75553	-6.28071	-7.02452	-4.29347

2010M02	3.132227	1.808456	3.29598	2.665131	-1.22877
2010M03	6.976024	8.380271	9.821654	4.503794	5.636693
2010M04	1.676522	4.719334	-0.34109	-0.37609	1.876369
2010M05	-1.28092	-4.46891	-12.7613	-2.64713	-3.87085
2010M06	8.095647	1.017871	-0.39444	7.707312	7.224579
2010M07	1.21226	7.194778	3.799991	-0.80469	2.20467
2010M08	4.624653	5.642248	0.57046	-0.46013	1.563364
2010M09	8.09924	15.04761	10.90303	10.12721	7.8851
2010M10	4.012221	-0.06296	0.065195	-1.10413	0.682459
2010M11	1.917676	-2.83557	-5.55265	-4.82848	-5.06883
2010M12	1.341195	-1.75522	8.940092	2.391491	0.020742
2011M01	-13.0999	-9.83368	-9.85547	-12.2546	-13.1596
2011M02	-7.21406	-1.85403	-5.39401	-8.32669	-6.64592
2011M03	12.57531	12.32591	7.412965	6.726985	10.31115
2011M04	2.897398	-1.67522	1.812845	-1.48845	3.511398
2011M05	-6.56071	-4.08329	-4.92285	0.423643	-1.6734
2011M06	-1.50301	2.216774	-2.61905	6.213499	-0.41425
2011M07	-0.45065	-2.91099	-3.34223	-6.54275	1.306156
2011M08	-4.14062	-12.4005	-10.6865	-7.30435	-4.01098
2011M09	1.217938	-0.49073	-4.66534	-10.8212	-0.49122
2011M10	11.51708	5.559995	6.712054	2.106215	5.512488
2011M11	-11.0044	-14.0003	-12.214	-11.8635	-10.5291
2011M12	-3.44582	-7.07624	-7.95338	-16.5524	-6.68782
2012M01	13.48449	24.44242	18.78607	22.27532	10.36926
2012M02	8.145942	5.122249	6.436653	5.693522	7.346406
2012M03	1.403456	-1.86218	-3.09939	-3.82156	-1.27413
2012M04	5.038442	0.659083	-4.14471	-6.17107	1.101438
2012M05	-16.6503	-7.98148	-6.99649	-6.29381	-6.9156
2012M06	6.591901	9.409501	6.651343	13.70606	5.629484
2012M07	-3.63548	0.014695	-1.5443	-4.24075	-0.86947
2012M08	1.386099	-3.31238	-3.65099	-1.59038	-0.32036
2012M09	12.69198	14.09151	10.09503	15.98314	12.75281
2012M10	-1.01727	-1.45692	-2.41063	-0.8532	-0.60398

2012M11	4.920803	7.759075	1.246123	1.989683	6.233735
2012M12	5.656778	2.817613	5.532786	-1.91414	2.305794
2013M01	-3.78332	1.640085	-4.0472	-3.42737	-1.77203
2013M02	-4.86915	-9.44009	-11.1316	-12.4921	-7.23135
2013M03	-4.44017	-1.29144	-4.08224	-1.8173	-2.93574
2013M04	9.642063	10.20758	0.730137	7.776024	5.938011
2013M05	1.902375	-0.7136	-1.8041	-3.20431	0.095518
2013M06	-4.03507	-7.03641	-5.78971	-3.14647	-5.24105
2013M07	-1.37153	-13.7037	-9.17049	-9.70588	-1.90228
2013M08	-3.46898	-9.93457	3.931984	-13.8795	-7.75533
2013M09	7.786775	6.403509	8.028894	8.769726	6.337667
2013M10	9.805858	19.36057	9.277301	18.75607	9.290583
2013M11	2.044406	-2.72501	2.053869	7.264564	0.105086
2013M12	-0.51072	2.133807	3.43739	4.557998	3.492785
2014M01	-5.62827	-9.91875	-7.6553	-7.57609	-5.60164
2014M02	8.901993	4.883409	-1.19655	9.370767	3.502693
2014M03	5.409593	18.62699	15.524	15.7642	10.78888
2014M04	0.692456	0.920915	-0.1821	0.891582	-1.60354
2014M05	8.387083	15.28015	18.76638	21.44266	13.74346
2014M06	5.212722	3.074344	9.021367	10.07963	9.676588
2014M07	1.583156	0.060257	-0.84303	-9.55901	-0.67079
2014M08	11.63885	2.962836	-1.20117	1.785126	4.545806
2014M09	2.620904	-2.15634	-1.64053	-4.32798	4.778786
2014M10	4.689101	10.72751	2.568127	11.612	2.805581
2014M11	3.450011	8.751069	-2.08137	2.80781	4.211844
2014M12	-3.0656	1.159906	-2.78223	-5.67689	-0.63085
2015M01	7.273209	5.859836	2.688631	10.70751	5.696526
2015M02	-0.01581	-0.62754	1.706763	3.999598	-2.19816
2015M03	-3.62353	-7.56507	-6.57244	-2.73619	-2.66403
2015M04	-4.79867	0.793518	0.3842	-4.4758	-3.60353
2015M05	4.06496	2.286019	0.871462	1.713239	5.421205
2015M06	-1.92675	-2.46132	-4.03927	4.26074	-0.23607
2015M07	2.114186	2.464282	-2.3492	3.216196	6.558687

2015M08	-6.50264	-8.66119	-8.90848	-10.6815	-6.43554
2015M09	-2.65426	0.226102	-3.29443	-6.43067	0.950117
2015M10	4.457055	0.46912	5.984601	-1.09388	0.975358
2015M11	4.393597	0.720243	-2.77367	-2.39975	3.19722
2015M12	-2.34798	-2.95015	2.684113	-3.14737	1.021301
2016M01	-7.95423	-8.92376	-6.5907	-12.4592	-6.42955
2016M02	-7.00738	-10.1629	-6.24884	-9.12569	-7.93096
2016M03	13.56467	16.29573	18.33086	14.43096	9.268334
2016M04	2.597746	3.930359	6.302645	2.653769	3.2867
2016M05	4.839627	5.215375	2.96737	9.561194	3.588088
2016M06	1.969659	2.085647	7.171743	2.833189	3.900138
2016M07	6.81942	5.588129	8.140774	4.054847	6.088659
2016M08	4.347993	4.511703	5.996216	-1.71657	2.797621
2016M09	1.015578	-2.69661	-0.87967	-4.14455	2.04712
2016M10	-0.20813	1.463601	5.548901	2.325164	1.180086
2016M11	-9.19871	-4.7043	-5.54169	-5.87307	-9.71119
2016M12	0.560001	-2.66124	-4.31168	-2.70575	-1.40741
2017M01	7.660449	7.534096	13.79095	8.187786	6.854088
2017M02	-1.48185	5.245929	2.278926	3.721559	4.181971
2017M03	2.450891	3.995879	3.385413	7.255622	5.096498
2017M04	3.496806	3.703814	4.295049	8.632722	4.99165
2017M05	6.055332	4.825536	0.697207	-1.50953	2.773406
2017M06	-3.1197	-1.01475	0.709402	-2.956	0.186371
2017M07	4.506888	8.024139	6.831902	5.251073	3.88448
2017M08	-3.1659	-3.33158	2.621934	-3.57077	0.514429
2017M09	2.074283	-1.51439	-1.37092	-0.91588	0.214095
2017M10	5.10636	4.657643	10.39342	7.285938	5.469587
2017M11	-0.82389	1.228327	-3.40253	0.17429	4.312374
2017M12	6.132939	0.787072	6.280384	3.675785	6.020189
2018M01	-3.01258	7.379066	-0.20802	6.427487	-2.98579
2018M02	-4.28941	-8.62412	-3.5657	-6.32399	-4.91717
2018M03	-3.12153	-3.94143	-8.08363	-3.14042	-1.06671

Table E.5: BSE Indices Return II

S& P BSE INDICES RETURN					
Year	**Consumer Durables**	**Energy**	**Fast Moving Consumer Goods**	**Finance**	**Healthcare**
2007M04	7.88478	4.86235	2.32760	7.68244	4.55275
2007M05	13.8155	9.224041	5.933187	10.84367	3.758079
2007M06	1.324647	-2.26623	-4.092	6.668932	-0.9407
2007M07	-1.84866	6.876566	7.862441	2.46245	-2.29761
2007M08	3.042375	0.54781	0.039024	-2.70889	-3.91151
2007M09	11.7525	16.50606	9.494764	21.30799	5.916615
2007M10	9.973274	22.87843	-1.60825	12.55275	3.824576
2007M11	1.560554	6.662356	1.327007	3.171491	-2.69895
2007M12	29.64984	7.160862	7.662393	5.896754	15.58372
2008M01	-26.6348	-19.4749	-6.57695	-8.97443	-18.4475
2008M02	-7.92577	3.350964	4.939234	-4.25292	9.026174
2008M03	-17.3652	-9.48603	0.689416	-22.2179	-2.05331
2008M04	16.99126	15.33068	7.480557	14.48162	11.0961
2008M05	-4.8929	-9.25952	-1.3659	-11.6628	2.82777
2008M06	-19.5153	-12.8881	-14.3107	-23.6331	-5.2698
2008M07	5.988038	6.666286	2.828878	10.66918	-0.05523
2008M08	4.203926	-1.28946	3.572397	5.993638	3.596803
2008M09	-23.735	-7.76425	-2.47518	-9.33304	-14.8328
2008M10	-29.23	-31.7634	-16.7038	-23.4671	-24.3327
2008M11	-13.4787	-9.61769	7.599051	-9.84597	3.92962
2008M12	6.700045	7.363684	2.622121	14.64657	2.713456
2009M01	-7.10128	3.637309	2.279886	-8.26336	-8.50755
2009M02	-13.2278	-3.04096	0.520001	-13.491	-4.30534
2009M03	5.366021	15.77888	-0.34357	6.699583	8.976126
2009M04	8.128826	15.82774	2.885711	25.75723	8.404974
2009M05	56.92429	28.91138	0.078282	44.40691	11.99389
2009M06	7.2645	-10.0399	7.919815	0.679091	3.373739
2009M07	5.430583	0.643962	21.01304	4.084403	7.128076

2009M08	5.650687	4.051123	-6.74287	-0.742	2.519809
2009M09	6.434541	6.964949	0.873304	15.12022	12.90282
2009M10	-4.53815	-9.46195	9.051487	-5.21634	-0.61441
2009M11	4.217776	7.508412	2.247443	7.489839	8.914603
2009M12	8.481614	2.243775	-2.80457	-0.2074	5.263235
2010M01	0.367201	-4.83678	-2.37037	-4.76688	-5.0453
2010M02	5.32968	-3.38778	-2.32371	1.742783	3.102532
2010M03	5.470815	5.810367	6.35112	7.495713	8.45495
2010M04	10.06063	-2.83358	1.647405	5.002588	0.30666
2010M05	-3.08201	2.184176	3.571875	-3.02842	2.723441
2010M06	5.189275	7.031256	8.376977	2.675134	4.708512
2010M07	11.79716	-5.60708	-0.01145	6.149421	-2.63691
2010M08	7.079247	-2.46633	4.805471	5.152834	-0.95155
2010M09	11.00753	5.291821	9.880741	13.84723	8.149093
2010M10	3.990403	4.574017	-3.07672	0.485301	7.297384
2010M11	-1.68142	-8.68017	-0.62106	-3.85626	2.325733
2010M12	-1.20399	5.639401	2.830539	-1.16892	2.298849
2011M01	-5.68353	-11.1048	-8.62947	-11.4283	-7.38485
2011M02	-6.07205	-0.0563	1.967203	-1.62856	-8.32019
2011M03	10.79762	8.538962	4.768647	11.34128	5.345788
2011M04	2.455891	-2.31263	4.423125	-1.40123	3.468341
2011M05	2.437224	-3.80676	2.74236	-4.02527	2.574709
2011M06	1.603056	-4.17355	4.854153	1.485595	0.077272
2011M07	1.532226	-5.23518	1.179111	-2.29174	0.356051
2011M08	-7.28736	-5.29381	-3.5071	-10.9613	-7.14061
2011M09	1.565454	0.776619	-0.99201	-1.55583	-1.5843
2011M10	3.669941	5.566813	7.318963	5.895755	4.574628
2011M11	-14.4154	-9.09174	-3.71182	-12.2788	-1.3171
2011M12	-6.37576	-8.2493	-0.13636	-6.66517	-3.0533
2012M01	11.77179	14.20888	0.967955	21.29201	7.929451
2012M02	11.08596	2.940814	2.269799	4.564668	0.006155
2012M03	-2.41847	-6.83799	7.829655	-1.60003	4.56615
2012M04	2.958693	-0.12787	6.208854	-0.30467	2.563487

2012M05	-5.92225	-5.31504	-4.14516	-7.06629	-2.21143
2012M06	0.117713	6.272903	9.133062	7.688455	3.590201
2012M07	1.417658	1.162175	1.071107	0.29976	3.744249
2012M08	-0.88632	0.425958	6.146864	-1.60339	4.956285
2012M09	11.19685	5.046047	2.832901	12.55171	0.437723
2012M10	-0.03084	-3.06932	3.267264	-1.15505	1.223233
2012M11	15.76228	-0.81209	6.164788	8.337158	4.277672
2012M12	-3.88657	2.958247	-2.01543	2.591017	2.339023
2013M01	-1.78259	9.927195	0.095838	0.033176	-1.41927
2013M02	-5.39985	-8.25883	-4.26874	-8.91986	-2.57705
2013M03	-1.08141	-3.62827	4.411459	-0.48498	2.532031
2013M04	4.762811	4.034848	10.63203	7.920561	8.530249
2013M05	3.532483	0.016828	3.414665	0.316322	1.791582
2013M06	-20.2765	1.874211	-4.63724	-6.24717	-0.01865
2013M07	2.080943	-3.97326	5.167008	-12.5718	2.585792
2013M08	-10.325	-5.33569	-6.618	-9.55433	-1.19451
2013M09	2.799784	1.23926	7.816092	6.492102	5.557024
2013M10	9.241437	8.08835	-0.34879	16.27599	1.535005
2013M11	-8.90093	-3.08464	-3.70023	-1.97366	-1.12623
2013M12	1.325457	2.5165	0.075891	1.768062	4.898504
2014M01	-4.69239	-5.40242	-0.74737	-7.98354	1.439858
2014M02	7.266888	-0.56528	-0.52118	3.635355	7.222624
2014M03	9.657961	13.50977	7.511768	15.90135	-6.97715
2014M04	-0.13607	0.955131	-2.98321	1.379007	6.681126
2014M05	18.35434	15.02491	1.494442	13.83025	-4.10808
2014M06	14.99431	1.967078	-2.738	5.586424	11.11754
2014M07	-3.53065	-3.51668	7.392839	0.215156	7.669101
2014M08	7.291802	3.471088	3.236236	1.564823	8.229211
2014M09	7.297061	-4.40027	3.096417	-1.8535	7.452569
2014M10	0.247189	3.466411	-1.75469	9.033045	0.011914
2014M11	-2.31481	-2.22095	3.156033	7.856694	4.197851
2014M12	0.281553	-7.8366	0.425283	0.685928	-1.76257
2015M01	10.14806	2.279648	6.552185	5.91538	6.626035

2015M02	-2.50785	-3.00542	-0.64129	0.413756	1.200586
2015M03	0.286192	-4.26364	-5.45998	-6.28946	9.021609
2015M04	-0.38626	1.224401	-2.13612	-1.75734	-6.35484
2015M05	2.779825	4.115047	3.154696	2.120301	4.409783
2015M06	0.745445	6.589943	-0.74318	-0.97787	-1.98801
2015M07	3.172083	0.77744	4.4221	2.977514	2.91814
2015M08	-0.34474	-12.6346	-4.24885	-8.81012	5.361958
2015M09	-2.16007	-2.69521	-0.46482	1.115774	-1.01666
2015M10	9.834027	5.966096	1.23005	1.116832	1.615767
2015M11	4.997882	1.591273	0.827443	-0.42339	-9.78627
2015M12	-3.75822	2.798611	-0.50771	-0.96677	3.723001
2016M01	1.546238	-1.22577	-5.50457	-8.13882	-3.55051
2016M02	-9.26683	-8.25766	-4.35665	-10.0128	-6.72978
2016M03	3.857956	7.722454	8.122483	12.88159	-0.38428
2016M04	2.671225	-1.36061	0.06578	3.21799	2.858755
2016M05	-0.21888	-1.22768	4.516472	6.367721	-2.15738
2016M06	1.8003	3.463478	5.068098	2.467029	1.619031
2016M07	3.604744	8.055845	3.225219	7.707528	5.203318
2016M08	0.649834	4.158126	1.112731	4.366742	-0.84305
2016M09	0.506515	2.284805	-4.09693	-1.42461	0.119913
2016M10	3.019151	3.407281	0.585036	1.624208	1.797589
2016M11	-12.7549	-3.66713	-5.16713	-6.63631	-4.47833
2016M12	-0.36725	2.795804	0.744663	-3.06876	-6.39831
2017M01	12.35895	2.927312	5.371012	8.009152	0.47136
2017M02	9.130114	8.801787	2.711501	5.391298	3.973505
2017M03	10.73159	1.930365	5.345067	5.481454	-0.47169
2017M04	1.424364	4.495349	1.532213	4.814468	-1.91348
2017M05	-0.4815	-2.63905	7.371851	2.923699	-9.69147
2017M06	3.977624	-3.40536	3.186377	0.195612	4.620976
2017M07	2.836622	10.74019	-3.20593	8.336395	0.033966
2017M08	7.493686	3.056121	0.795237	-1.43729	-7.36957
2017M09	-0.8251	-1.95713	-3.9454	-1.37933	2.574289
2017M10	5.188022	14.68392	5.024297	3.283122	5.885633

2017M11	16.21934	-3.2035	0.559836	0.206485	-2.03983
2017M12	5.726072	0.625944	3.623617	1.009797	5.783587
2018M01	-0.93731	3.24854	0.152312	5.918404	-1.62189
2018M02	-5.73739	-2.82576	-1.91486	-7.31348	-3.06593
2018M03	5.072353	-6.68642	-2.05799	-2.40685	-6.76957

Table E.6: BSE Indices Return III

S& P BSE INDICES RETURN					
Year	**Industrials**	**Information Technology**	**Metal**	**Oil & Gas**	**Power**
2007M04	5.16782	2.015548	3.39463	5.16899	5.624706
2007M05	9.789426	-3.99463	5.797949	9.254359	7.204169
2007M06	6.730548	0.397821	1.912456	-2.168	9.604706
2007M07	7.015933	-0.16856	9.673927	6.606299	7.265352
2007M08	-0.34148	-5.69376	-0.5598	0.36443	2.114369
2007M09	10.87451	0.919606	20.57426	17.17889	16.0516
2007M10	26.71448	-0.19685	28.24977	21.92576	33.42507
2007M11	0.979375	-9.11724	-0.8633	6.014935	-0.09957
2007M12	7.028126	7.908529	12.91383	7.620474	4.710397
2008M01	-16.8436	-18.0917	-23.5127	-19.5195	-17.7535
2008M02	-4.17746	4.106078	9.316316	3.054217	-1.87984
2008M03	-13.968	-8.1513	-16.2308	-9.20346	-13.1065
2008M04	3.904055	20.13525	14.91768	14.8647	4.671125
2008M05	-6.93668	8.959791	4.965931	-9.6381	-12.0573
2008M06	-23.3334	-13.4367	-21.9179	-13.3472	-23.29
2008M07	11.16768	-8.21554	-2.23127	7.995418	14.2906
2008M08	1.526083	7.512529	-4.37239	-0.71967	1.159164
2008M09	-14.8126	-21.9744	-27.1781	-6.42044	-13.2037
2008M10	-35.1385	-7.5326	-40.3073	-31.4589	-29.9477
2008M11	-10.6627	-10.5872	-18.3363	-9.32046	3.051719
2008M12	10.95162	-12.9343	18.95729	7.687214	12.11137
2009M01	-9.75779	0.383759	-2.1903	3.345763	-2.02207
2009M02	-6.68591	-6.27496	-8.02272	-3.01241	-2.26355

2009M03	9.958576	9.040774	23.53671	16.30792	5.443128
2009M04	24.74817	16.52331	18.82186	15.30659	14.38255
2009M05	52.18963	12.54811	57.98316	28.11947	36.37895
2009M06	4.225322	9.662891	-0.43683	-9.87881	-1.35422
2009M07	3.374592	20.53176	14.44349	0.957812	4.507554
2009M08	4.974584	5.310288	-0.09955	3.107987	0.72312
2009M09	5.26943	9.547947	14.48527	7.171349	2.811219
2009M10	-5.92027	-3.18077	-1.66789	-9.93995	-5.24796
2009M11	6.193985	7.496294	16.8711	8.991746	2.223961
2009M12	6.449162	9.019459	6.7959	1.830444	7.018433
2010M01	-5.78515	-4.02287	-8.25997	-5.08043	-3.98394
2010M02	1.324379	3.943179	2.753218	-3.44864	-3.26504
2010M03	5.895081	1.227486	9.586246	5.865839	4.192385
2010M04	3.032278	2.29747	-1.71945	-2.31742	2.75106
2010M05	-5.41726	-3.41799	-14.2549	2.589455	-4.35184
2010M06	6.318389	2.792626	-2.92091	6.811431	3.873536
2010M07	1.124375	2.92581	4.730333	-6.51087	-1.26536
2010M08	1.130218	-1.81229	-2.74231	-2.41498	-2.4818
2010M09	8.060509	10.6304	12.60164	5.305717	6.66293
2010M10	0.247425	0.768446	-1.08705	4.803685	-3.61592
2010M11	-4.42483	1.689202	-6.32716	-8.09895	-7.26967
2010M12	0.899274	11.99245	12.6055	5.360124	3.35745
2011M01	-12.3421	-6.64809	-8.41215	-10.56	-8.17651
2011M02	-7.41825	-4.14826	-4.75847	-0.23687	-8.05007
2011M03	8.167547	7.226195	5.294091	8.258303	7.483088
2011M04	-0.54656	-6.1653	0.180678	-2.2691	-1.81261
2011M05	-2.3496	-2.44093	-4.8131	-4.13908	-4.02298
2011M06	1.938106	1.766479	-2.26736	-4.02084	2.198512
2011M07	-5.45922	-4.34175	-6.93917	-4.43917	-5.97777
2011M08	-10.075	-13.2571	-13.6952	-5.0712	-9.08965
2011M09	-4.82628	4.215867	-9.10574	1.69036	-4.80283
2011M10	3.563568	10.48352	8.262691	5.804614	3.749865
2011M11	-14.0494	-5.64783	-14.1093	-9.28944	-12.1862

2011M12	-11.3396	4.597852	-9.1089	-7.64612	-7.25267
2012M01	24.0145	0.448197	23.73453	12.89647	15.57671
2012M02	6.36224	6.634982	4.813782	2.48733	9.861252
2012M03	-2.06695	-1.28533	-5.85842	-7.16518	-8.30647
2012M04	-1.04212	-6.20796	-2.46565	-1.51926	-3.75472
2012M05	-11.5947	-0.67019	-8.67569	-4.73079	-9.86603
2012M06	8.051381	1.748652	6.717789	6.429102	9.573242
2012M07	-4.56077	-7.28757	-2.85359	1.021711	-4.56137
2012M08	-2.03185	7.426352	-7.54056	0.653945	-1.37435
2012M09	14.77946	3.146661	8.678054	5.481195	9.514494
2012M10	-1.73426	-3.44357	-3.60099	-3.53964	-4.71928
2012M11	3.729412	2.967987	2.030523	-1.23147	1.444056
2012M12	2.255991	-3.4702	6.908999	3.228738	0.534254
2013M01	-3.71322	12.48311	-4.19579	9.867607	-1.99356
2013M02	-9.87328	5.641553	-14.5027	-7.5979	-10.6164
2013M03	-3.8479	1.941421	-3.41455	-3.71713	-5.59439
2013M04	7.6952	-17.0769	-1.22478	4.61677	7.010021
2013M05	-1.39161	6.229815	-1.71124	-0.6455	-0.38594
2013M06	-6.2885	3.128596	-8.81159	2.837966	-7.55333
2013M07	-7.23286	19.23375	-11.2371	-3.61568	-7.82657
2013M08	-7.01388	7.634024	13.11203	-5.00303	-7.28557
2013M09	8.775638	-2.34555	7.53177	0.821286	9.821145
2013M10	14.20819	8.144519	9.614836	8.760227	5.355337
2013M11	6.084027	-0.74879	2.558818	-3.19412	1.708501
2013M12	1.98468	7.933327	5.880196	2.123995	4.229228
2014M01	-7.65904	4.347606	-8.15633	-4.31675	-10.3137
2014M02	9.93737	3.330618	-5.36236	-0.32024	0.209789
2014M03	11.08807	-10.2415	16.14476	12.57692	12.82008
2014M04	2.752205	-0.42779	-0.77611	0.661521	-2.20122
2014M05	17.97444	-3.38697	23.16054	13.6736	28.46716
2014M06	8.789462	10.53462	6.566992	2.734453	7.018669
2014M07	-4.38471	4.239629	-0.27237	-3.59666	-7.98587
2014M08	5.452667	3.526155	-6.21229	4.047227	-4.30269

2014M09	-2.69834	5.96597	-6.88241	-4.0771	-3.11938
2014M10	7.268666	0.134736	3.86129	4.019991	9.521956
2014M11	2.658959	4.723047	-4.58821	-2.20319	-0.01246
2014M12	-3.62613	-5.563	-4.89605	-9.3372	-3.39913
2015M01	9.889625	5.619153	-5.23116	2.506162	6.308691
2015M02	2.980714	7.073893	3.723774	-4.51061	2.00223
2015M03	-3.46359	-4.72335	-10.4451	-3.85858	-6.24267
2015M04	-3.92361	-8.70861	3.542493	-1.16517	-1.51593
2015M05	0.60123	4.797531	-0.74095	4.778208	-1.20993
2015M06	-2.13017	-4.22531	-4.04036	2.240125	-2.30311
2015M07	2.612617	5.964142	-7.14407	0.435531	2.097778
2015M08	-8.51881	0.800801	-14.1007	-10.3429	-11.1481
2015M09	-5.64077	3.73181	-8.2238	-2.06488	0.39795
2015M10	3.745173	-2.71276	6.936486	4.269507	4.094587
2015M11	1.158414	-2.78557	-2.59095	2.895355	-0.79599
2015M12	-2.37584	1.016345	3.927287	2.43579	2.935563
2016M01	-11.0103	0.937864	-6.81201	-3.11388	-6.0919
2016M02	-10.7838	-8.37936	-1.95489	-11.2747	-13.9217
2016M03	16.44203	11.32471	11.5621	11.53326	12.21184
2016M04	3.57575	-0.50738	5.545602	2.123535	3.976393
2016M05	5.211193	2.170929	-0.10743	-0.36553	1.37407
2016M06	2.398396	-3.2497	7.16079	4.280108	6.643123
2016M07	5.504546	-3.45314	10.40496	8.993771	4.034468
2016M08	1.642349	-3.45735	5.672559	4.506556	1.051248
2016M09	-2.24951	-2.01411	-1.77138	2.753075	-5.18583
2016M10	3.496722	-1.91972	5.672975	8.25538	0.830322
2016M11	-9.10196	-1.80579	3.380163	-2.86186	1.127555
2016M12	-0.76929	3.293898	-5.22168	1.565655	-2.02836
2017M01	8.438165	-5.79508	15.46075	5.649608	9.063283
2017M02	0.298076	8.238389	1.891055	5.423752	1.294448
2017M03	5.91558	-0.10206	-0.74489	0.21545	3.581415
2017M04	5.445194	-7.20196	-4.24484	6.571987	2.432708
2017M05	-0.14554	6.347132	-0.49339	-1.4386	-4.68548

2017M06	-1.69785	-3.87174	1.124772	-7.33084	0.222914
2017M07	4.920507	6.14565	9.247924	7.47812	4.406571
2017M08	-4.3301	-3.58275	6.905365	6.957736	-2.67472
2017M09	0.513022	-1.16486	2.106662	-2.2054	-2.44223
2017M10	8.960508	4.178513	8.599075	11.52	6.480285
2017M11	0.017499	3.557635	-5.62087	-3.77281	-1.21403
2017M12	5.369846	5.096884	7.459054	2.23099	2.628971
2018M01	1.030222	11.34236	3.267092	0.521394	-2.61201
2018M02	-4.25485	-0.40814	-1.64357	-5.26877	-4.15352
2018M03	-6.2299	-3.23995	-12.2037	-5.74844	-4.37714

Table E.7: BSE Indices Return IV

S& P BSE INDICES RETURN					
Year	**PSU**	**Reality**	**Teck**	**Telecom**	**Utilities**
2007M04	3.56720	7.53119	1.14902	3.78265	2.25631
2007M05	5.247452	19.18604	-0.52827	4.810293	4.026877
2007M06	0.9123	-5.90203	0.486281	0.482045	5.486871
2007M07	5.262585	13.27015	2.327255	6.681955	14.48501
2007M08	-0.89531	-7.79725	-4.82317	-2.81937	-2.28332
2007M09	15.59635	26.74639	3.844393	8.300799	26.34545
2007M10	17.39024	14.42758	5.802974	16.29628	28.41937
2007M11	-0.15693	1.176261	-7.93793	-7.7678	5.114146
2007M12	8.892037	19.77272	9.453554	10.47633	14.707
2008M01	-21.7941	-22.4426	-18.2826	-18.7805	-19.5623
2008M02	3.633454	-3.09379	-0.50229	-4.15412	-4.84715
2008M03	-12.4624	-21.0217	-7.36315	-5.52499	-13.251
2008M04	8.815336	12.58392	14.82608	10.52737	12.62911
2008M05	-12.397	-17.5984	4.109731	-1.86851	-10.0769
2008M06	-19.962	-35.1735	-15.8002	-19.1646	-24.576
2008M07	18.3488	11.78703	-1.43167	10.51582	16.4947
2008M08	0.610336	-1.64914	2.439	-5.24472	0.847219
2008M09	-7.42604	-29.7579	-17.1682	-9.33829	-12.999
2008M10	-26.9149	-43.6201	-15.1011	-23.2389	-28.6441

2008M11	0.458058	-21.091	-7.39411	-0.3135	3.056504
2008M12	15.12878	45.68324	-2.72728	9.359792	15.39082
2009M01	-3.10629	-26.6498	-6.59206	-13.1663	-1.12631
2009M02	-2.55336	-15.2804	-4.52084	-1.65171	-3.61638
2009M03	4.918365	10.44729	6.355422	2.818443	6.226683
2009M04	12.11031	36.49212	17.1196	18.01665	13.33616
2009M05	43.72565	79.30304	16.50301	19.30249	33.82756
2009M06	-5.99079	-16.0397	3.311957	-3.43616	-4.27032
2009M07	5.593135	21.87522	12.52314	1.634388	8.156346
2009M08	0.199505	12.91506	4.006895	0.872785	0.006874
2009M09	6.284253	2.176686	7.021396	2.036501	4.147497
2009M10	-5.71267	-15.1348	-12.4324	-31.3891	-6.48938
2009M11	8.799552	-4.35522	6.008328	1.337428	6.084318
2009M12	4.292961	5.336229	8.262827	7.148653	4.332457
2010M01	-0.6064	-9.22148	-3.82266	-4.05758	-6.56467
2010M02	-2.74068	-7.52896	0.870622	-6.94824	-3.74089
2010M03	-1.91019	1.139127	3.174059	8.620839	4.573063
2010M04	0.827371	6.647809	1.031974	-3.86951	4.429127
2010M05	0.229232	-11.2644	-5.4397	-12.3808	-3.53533
2010M06	4.102392	3.192465	4.619779	9.643148	3.650094
2010M07	0.714612	5.508912	3.724908	8.228138	-2.34929
2010M08	0.675918	-1.2206	-0.75634	2.110324	-1.07102
2010M09	6.61973	11.8586	10.1195	8.67284	4.628007
2010M10	-1.35794	-2.46159	-0.95227	-6.32391	-2.94487
2010M11	-8.37251	-19.524	1.201847	0.905786	-5.74896
2010M12	1.825745	-2.3648	8.630316	0.404363	3.711836
2011M01	-7.96723	-21.9696	-7.73857	-10.4454	-10.3338
2011M02	-3.74727	-11.0857	-4.30498	-4.29674	-8.69281
2011M03	6.914413	17.93253	7.929244	10.56123	8.835563
2011M04	1.230011	-6.71413	-3.83465	4.846093	-0.5958
2011M05	-5.37921	-0.0977	-2.27761	-2.90843	-5.29698
2011M06	-0.46188	-7.26043	1.949048	2.898244	1.179142
2011M07	-2.75345	1.067411	-1.39642	9.897418	-0.93934

2011M08	-8.3286	-14.785	-12.0315	-8.52303	-9.66559
2011M09	-2.78113	1.344003	1.466031	-5.96308	-3.00231
2011M10	2.042999	8.889595	8.417524	2.872909	4.845391
2011M11	-9.21909	-18.1551	-4.89185	-2.1198	-10.2921
2011M12	-7.198	-12.4437	0.818719	-10.7829	-5.17969
2012M01	15.5822	24.16312	2.852156	11.20062	13.13851
2012M02	5.53728	14.49314	4.1816	-3.45412	6.476572
2012M03	-5.82905	-9.13479	-1.64631	-3.87215	-5.52365
2012M04	-0.85496	-4.74912	-6.63371	-9.19881	-5.19999
2012M05	-6.74386	-6.71582	-1.46538	-4.56462	-8.58733
2012M06	7.368382	5.634936	2.045555	1.107619	9.920021
2012M07	-2.11099	-1.81249	-5.44105	-1.11734	-3.4479
2012M08	-2.3309	-7.73858	2.839914	-15.1515	-0.76869
2012M09	6.865599	22.24421	5.069752	9.703348	8.728153
2012M10	-4.19563	-4.08121	-2.93962	-1.26898	-4.90813
2012M11	1.027212	12.79846	6.368455	22.10236	1.533018
2012M12	2.188181	5.626614	-2.834	-3.51772	1.072538
2013M01	4.459072	6.053155	10.80895	6.854068	-2.52944
2013M02	-10.433	-10.1949	2.596869	-5.78409	-8.19144
2013M03	-5.55577	-11.4537	0.099562	-8.4559	-5.27841
2013M04	5.916379	6.81033	-10.9384	14.82887	7.67109
2013M05	-3.04125	-11.3816	3.692606	-3.66438	-4.21844
2013M06	-7.40478	-10.321	2.124896	0.03913	-5.78078
2013M07	-11.572	-12.8436	16.75066	17.31402	-7.14605
2013M08	-8.44048	-10.8797	3.889555	-11.2253	-3.19172
2013M09	9.142614	-0.28458	-0.56987	8.690639	9.20031
2013M10	6.576729	14.79412	8.513655	9.684107	4.718094
2013M11	0.088212	0.926705	-1.58285	-6.24432	-0.78062
2013M12	1.728777	5.714939	6.601203	-0.38369	2.732893
2014M01	-6.00365	-15.4743	2.300384	-6.21676	-8.69151
2014M02	-0.72116	-0.66854	1.80744	-7.64431	-0.63222
2014M03	15.22662	22.0108	-6.77105	10.3764	9.579398
2014M04	2.178733	-4.87674	-0.50502	1.522922	-0.19548

2014M05	24.04829	35.62096	-1.01149	7.610303	25.37516
2014M06	7.189495	9.649271	9.021277	2.054933	8.917848
2014M07	-7.19931	-8.86319	4.211068	5.672694	-7.36124
2014M08	1.051416	-8.74735	1.934721	-1.36015	-4.89341
2014M09	-3.87573	-8.46165	5.798213	5.961845	-0.92834
2014M10	7.20681	-1.76124	0.320511	-0.1839	8.927481
2014M11	0.812382	8.345457	3.722011	-2.0467	-2.27452
2014M12	-2.19161	-7.6046	-5.14447	-5.38518	-4.36055
2015M01	-0.26438	16.48093	5.043976	3.772851	3.646771
2015M02	-1.24947	0.582987	4.683467	-3.40247	0.869485
2015M03	-6.10414	-8.63979	-2.6017	8.278365	-5.87668
2015M04	-0.55021	-5.49411	-7.36549	-1.61722	-2.7206
2015M05	3.300384	-2.24912	5.630177	9.671914	-1.49737
2015M06	-2.27795	-8.09141	-3.2235	-2.23749	-2.22389
2015M07	1.062746	-1.83335	4.966345	0.805888	-1.56903
2015M08	-10.4148	-9.1318	-1.96925	-13.2779	-10.4277
2015M09	-3.18481	10.78324	2.607493	-4.17386	3.195329
2015M10	1.23499	-1.78791	-2.2479	3.385401	4.662823
2015M11	1.538627	-2.02241	-2.81619	-1.40265	4.155077
2015M12	-0.98928	0.032741	1.852999	4.973589	4.945967
2016M01	-8.49953	-10.0704	-2.05967	-17.8612	-3.04605
2016M02	-11.3668	-13.0584	-6.99448	1.862643	-12.5012
2016M03	10.5102	16.86551	10.72367	8.240366	11.22805
2016M04	2.644822	10.44979	0.276665	3.633701	2.894873
2016M05	-0.18139	4.744566	1.720913	-2.97986	1.431506
2016M06	7.348656	7.863034	-2.54179	0.332188	6.790508
2016M07	6.990909	4.844013	-1.93909	1.92123	2.487367
2016M08	4.448152	-4.04276	-3.32508	-7.5883	3.210089
2016M09	-0.57742	-1.93956	-2.12836	-4.1163	-5.02394
2016M10	6.34377	2.906381	-1.87877	0.284954	3.299031
2016M11	-0.70868	-17.6282	-2.05882	1.243448	1.736899
2016M12	-2.3901	-1.39489	1.611821	-6.11575	-0.76015
2017M01	8.400823	8.369859	-2.91735	10.98212	8.302032

2017M02	1.521697	9.149978	8.004563	3.872285	0.921007
2017M03	1.564695	7.01711	0.105804	-3.96325	2.490189
2017M04	4.921999	20.24725	-5.566	2.98629	3.351517
2017M05	-3.7994	0.373716	4.778881	0.065742	-3.20265
2017M06	-6.50595	5.805987	-3.27351	2.068734	-0.79538
2017M07	7.077624	7.00117	6.757909	10.62291	4.965194
2017M08	-0.479	-2.22341	-3.18889	-0.61303	-0.26985
2017M09	-3.73549	-3.38032	-1.7765	-4.9387	0.642557
2017M10	12.96093	11.42001	6.546151	19.53839	7.665814
2017M11	-2.31819	6.274334	1.773158	-3.95665	-0.35409
2017M12	-0.10509	6.647667	5.388293	6.968472	3.245076
2018M01	-0.61843	0.032206	6.607129	-11.7508	-4.73496
2018M02	-8.56254	-5.3946	-1.30525	-2.94547	-3.41728
2018M03	-5.6964	-9.65912	-3.39906	-7.8597	-3.80817

Table E.8: S& P BSE Cap

Year	LargeCap Return	MidCap Return	SmallCap Return
2007M04			
2007M05	5.267524	7.361984	5.993703
2007M06	1.353938	4.895699	4.281245
2007M07	5.410051	2.927059	4.401195
2007M08	-1.62446	-1.63231	-0.12527
2007M09	12.91205	12.31777	12.89507
2007M10	16.10795	9.603055	7.65863
2007M11	-1.53607	5.142461	7.442793
2007M12	6.04667	14.44931	26.81308
2008M01	-14.8439	-20.6637	-24.1524
2008M02	0.317743	-1.11026	-4.90191
2008M03	-11.55	-16.3087	-18.5551
2008M04	10.6933	11.06005	11.88466
2008M05	-5.20905	-5.29785	-7.30068
2008M06	-18.2453	-20.3247	-17.5959

2008M07	6.057083	3.358223	3.145796
2008M08	1.708613	3.141878	-0.30595
2008M09	-11.2823	-16.4394	-19.069
2008M10	-25.1837	-33.3092	-32.4943
2008M11	-7.05944	-9.82056	-12.2307
2008M12	7.562231	12.10392	11.4537
2009M01	-2.63114	-9.07498	-9.34156
2009M02	-5.64607	-6.2275	-6.97923
2009M03	9.588962	7.176185	4.527352
2009M04	17.25299	18.86288	21.38433
2009M05	29.11434	43.90841	51.91504
2009M06	-0.66393	0.387601	-4.12205
2009M07	8.025726	9.744816	8.114752
2009M08	0.56227	5.599513	12.7493
2009M09	8.515346	7.499443	8.475167
2009M10	-6.82559	-4.89962	-7.00023
2009M11	6.546281	6.670269	6.577113
2009M12	3.21632	4.712827	11.09454
2010M01	-5.83661	-3.09654	-1.49492
2010M02	0.557211	-1.72018	-2.00761
2010M03	6.302446	6.382799	5.330466
2010M04	0.61723	5.562592	8.352055
2010M05	-3.6035	-4.87016	-7.16813
2010M06	4.429275	4.599063	6.131159
2010M07	1.136883	3.618582	3.062109
2010M08	0.822836	2.550382	2.049317
2010M09	10.95833	6.414509	7.390971
2010M10	-0.16537	2.701833	3.434514
2010M11	-2.95159	-6.48643	-8.04787
2010M12	4.222636	0.498324	-0.76349
2011M01	-10.2387	-11.9748	-12.3315
2011M02	-2.98174	-7.20872	-7.79092
2011M03	9.130668	7.847983	4.586866

2011M04	-1.37809	3.213257	6.597692
2011M05	-3.25039	-2.59393	-5.50284
2011M06	1.43142	-0.81314	-0.96069
2011M07	-2.82108	0.893778	1.826496
2011M08	-8.55881	-9.27956	-14.1363
2011M09	-1.22409	-2.29549	-3.51119
2011M10	7.071187	2.747329	1.359234
2011M11	-9.26178	-10.6431	-12.5792
2011M12	-4.3861	-8.75386	-8.97321
2012M01	12.48785	14.34553	16.45292
2012M02	3.763398	8.772928	6.137267
2012M03	-1.89985	-0.63318	-3.36138
2012M04	-0.93411	-0.48106	2.04001
2012M05	-6.09396	-6.45835	-7.29708
2012M06	6.95366	4.159988	4.349386
2012M07	-1.12025	-2.29845	-1.46491
2012M08	0.499147	-0.12075	-0.81887
2012M09	8.295134	10.02944	9.738721
2012M10	-1.35729	-0.62507	-0.40924
2012M11	4.602945	5.117279	4.098913
2012M12	0.737865	3.05564	1.433411
2013M01	2.333409	-1.99652	-4.14461
2013M02	-5.67665	-9.58416	-12.268
2013M03	-0.70192	-2.54999	-6.47044
2013M04	4.104841	3.288473	3.729941
2013M05	0.845488	0.716105	-1.29045
2013M06	-2.57542	-6.6511	-5.04656
2013M07	-1.27328	-7.06463	-5.891
2013M08	-4.40876	-4.37893	-2.25586
2013M09	4.949977	5.765225	5.297183
2013M10	9.15867	8.943485	7.864089
2013M11	-1.52527	3.573236	3.449902
2013M12	1.954502	6.007038	7.404025

2014M01	-3.54481	-5.92807	-4.39283
2014M02	2.919426	3.049595	2.900844
2014M03	7.090088	8.960036	9.72717
2014M04	-0.12834	3.396933	5.909394
2014M05	8.828364	15.61775	20.37232
2014M06	5.407063	10.76776	13.17098
2014M07	1.233226	-2.03392	-2.09513
2014M08	2.922226	1.204916	2.753213
2014M09	-0.14593	2.489004	4.062663
2014M10	4.223722	3.192433	2.335729
2014M11	3.02941	4.433429	3.10897
2014M12	-3.49709	0.992833	-1.63005
2015M01	6.621715	3.52863	2.184436
2015M02	1.055272	0.6729	-0.55449
2015M03	-4.42837	-2.02232	-3.33726
2015M04	-3.48699	-1.66094	0.491991
2015M05	3.045658	2.878184	3.075101
2015M06	-1.16842	-0.33688	-1.81923
2015M07	1.813894	5.552721	6.821003
2015M08	-6.33756	-4.77778	-7.26519
2015M09	-0.7002	0.603479	0.451725
2015M10	1.552876	1.624194	2.672757
2015M11	-1.58747	0.138137	2.837728
2015M12	0.174924	1.395117	1.720622
2016M01	-5.29514	-6.51364	-8.1684
2016M02	-7.38456	-8.08428	-12.1576
2016M03	10.62557	10.90171	10.40339
2016M04	1.418245	3.992579	4.543014
2016M05	3.858189	2.926038	1.105476
2016M06	1.7763	3.08973	5.913437
2016M07	4.604737	8.055153	4.309942
2016M08	1.470034	4.393392	2.75257
2016M09	-1.6552	-0.38306	1.043657

2016M10	0.653755	2.327314	6.277698
2016M11	-4.76941	-7.23285	-9.22828
2016M12	-0.76983	-3.73865	-2.2995
2017M01	5.073897	6.866484	7.384363
2017M02	3.907456	5.403474	5.837738
2017M03	3.307177	4.017275	5.427363
2017M04	1.607352	4.978488	6.503111
2017M05	2.938841	-1.17012	-1.90145
2017M06	-0.69979	0.131211	2.190354
2017M07	5.874021	5.087856	4.432297
2017M08	-1.48864	0.976116	-0.63336
2017M09	-1.57066	-0.66783	0.763212
2017M10	5.871326	7.462874	9.227005
2017M11	-0.92561	1.986137	3.570242
2017M12	2.909837	5.349273	5.495952
2018M01	4.122736	-2.57092	-2.67255
2018M02	-4.68021	-4.61645	-3.14606
2018M03	-3.42151	-3.62262	-6.25317