FDI and Macro Variables in India:
A study of Bidirectional Relationship

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Department of Economics
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Under the supervision of

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Submitted by

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2012-2015

CERTIFICATE

Department of Economics
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Dated:

This is certify that I, **Manoj Kumar** have carried out the research embodied in the present thesis "**FDI and Macro Variables in India : A study of Bidirectional Relationship**" for the full period prescribed under Ph.D. ordinance of the University.

I declare to the best of my knowledge that no part of the thesis was earlier submitted for the award of research degree of any university

Signature of the candidate

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Declaration

The present work as above has been submitted to Department of Economic, Central University of Haryana in fulfillment of the requirements for the award of the degree of Doctorate of Philosophy in Economics is a record of original work done by **Mr. Manoj Kumar** during the period of his study (2012-2015) under my supervision and guidance. The declaration as above by the scholar is correct to the best of my knowledge.

It has not been submitted in part or full for any other award of any Degree/Diploma of this University or any other institution. I deem the present research work fit for being evaluated for the award of degree of Doctorate of Philosophy in Economics.

Signature of the supervisor

Dr. Ranjan Aneja
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Chapter: 1
Introduction and Background of Study

1.0 Definition and Meaning of FDI

Foreign Direct Investment has played an important role in the process of globalization during the last two decades. The rapid expansion in Foreign Direct Investment (FDI) by multinational enterprises may be attributed to significant changes in technologies, greater liberalization of trade, investment regimes, and privatization of markets in many countries including developing countries like India. Stronger positive relationship exists between FDI inflow, and domestic saving and growth (Chung Chen, et al.1995). There is no specific definition of FDI owing to presence of many authorities like the IMF, OECD, IBRD and RBI. All these bodies have attempted to illustrate the nature of FDI with certain measuring methodologies. The key feature that distinguishes FDI from other capital flows is the intention to exercise control over a firm or institution.

According to the Balance of Payments and International Investment Position Manual, Sixth Edition (BPM6) of the International Monetary Fund (IMF), "*Foreign Direct Investment (FDI) is a category of cross-border investment associated with a resident in one economy having control or a significant degree of influence on the management of an enterprise that is resident on another economy*."[i]

Foreign Direct Investment is a category of investment that reflects the objective of establishing a lasting interest by resident enterprise in one economy (direct investor). That is resident (direct investment enterprise) of an economy other than that of the direct investor. The lasting interest implies the existence of a long-term relationship between the direct investor and the direct investment enterprise and significant degree of influence on the management of the enterprise.

Trade in goods and services do not exist as a factor of production such as labour and capital were not internationally traded. In recent times, however, international labour movement (migration) and international capital movement (foreign investment) have become the order of the day due to globalization of world economies. Foreign direct investment and skilled labour have perhaps become most traded factors of production now the days.

Resource-seeking FDI is motivated by the availability of natural resources, for example minerals, raw material and agricultural products in host countries[ii]. Market-seeking FDI in developing countries shows the size and growth of host-country markets where these are among the most important FDI determinants. Efficiency-seeking FDI is motivated by creating new sources of competitiveness for firms and strengthening the existing ones, the intention of difference in cultures and institutional arrangements and economic system.[iii] Accordingly, the competition for FDI would be based increasingly on cost difference between locations, the quality of infrastructure and business-related services, the ease of doing business and availability of skills.

Foreign Direct Investment (FDI) flows are usually preferred over other forms of external finance because they are non-debt creating, non-volatile and their returns depend on the performance of the projects financed by the investors. FDI also facilitates International trade and transfer of knowledge, skills and technology.

The world economy welcomes FDI with FDI favorable policy. Moreover, trade policy is also becoming more flexible by evading tariffs and trade barriers. The FDI efficiency in promoting growth also depends on trade policy. Most of the countries have liberalized their economies, reformed their institutions and improved infrastructure facilities to attract more FDI inflows. India has initiated its economic reforms in 1991 only and opened the door widely for the multinational companies (MNC). The motive behind allowing FDI was to, despite complimenting to domestic investment; intensify the quality of products through

infusion of modern technology to make the product tradable at international market. Therefore, it becomes a source of foreign exchange earnings through promoting exports.USA was most attractive destination for FDI during 1988-89. During this period the position of India in largest host economies was negligible. In 2011, India ranked 13th with US$26 billion as host economy. In 2012, India ranked 14th with the inflow of US$25.5 billion. India recorded negative growth of FDI inflow during 2011 and 2012. USA, China is still on the top most attractive countries as host economy. India was the world's 3rd most attractive destination for investment by transnational corporations in 2013. Global FDI flows were US$199.3 billion in 1991. Global FDI flows rose by 11% in 2013 to an estimated US$1.46 trillion, up from a revised US$1.32 trillion in 2012. FDI inflow increased in all major economic groups-developed, developing and transition economics[iv]. Besides in India in 1991 total FDI inflows were US$155 million[v] which was less than 1(0.07) per cent of Global FDI. In 2013, India received US$ 28 billion[vi] which is 1.91 percent of Global FDI and it is a positive sign. Though, this is the turtle speed of FDI inflow but consequently, India has registered significant growth rate in post reform period.

1.2 FDI and Macroeconomic Variables

Macroeconomics is the branch of economics that studies the behavior and performance of an economy as a whole. It focuses on the factors which include level of employment, unemployment, gross national product, balance of payments components, and price. Macroeconomic also covers role of fiscal and monetary policies, economic growth, and determination of consumption and investment level.

Mostly, models and theories are generated on trade conditions with comparative analysis. Vast literature on the determinants of FDI in developing countries clearly indicates the importance of infrastructure, skills, macroeconomic stability and sound institutions to attract the FDI inflows. There are merely few studies found which explain the relationship between

macro variables of host country and foreign direct investment. The casual relationship between FDI and macro variables has been pointed out by many researchers. E.Borensztein et al. (1997) found that the FDI has a positive overall effect on economic growth and domestic Investment;Magnus Blomstrom et al. (1997)has shown that the employment was associated with foreign production mainly among manual labour; Dua Pamiet al. (1998) found the causal relationship between economic activity and actual flows of FDI which affect output; Riccardo Faini et al. (1999) investigated that Italy imports jobs through trade and exports them through foreign direct investment; Kohli Renu (2001) concluded that the Capital flows financed more investment than consumption, current account deficit widened in correspondence with capital surge and capital flows are associated with real appreciation. Kevin Honglin Zhang (2001) investigated long run FDI-GDP links exists with unidirectional and bidirectional relationship;Elizabeth Asiedu (2002), found that trade openness also promotes FDI; David Deok et al. (2003), found that FDI does not crowd out domestic investment; David Deok-Ki Kim et al. (2003), investigated that FDI shows strong dynamic endogeneity to domestic macroeconomic conditions and FDI crowds out Domestic Investment; Faiza Saleem et al. (2013),Positive relationship exists between foreign direct investment and inflation and there exists a negative relationship between gross domestic product and foreign direct investment; Jason Kiat (2007), Inflation was a negative impact on FDI, while the effect of exchange rate was debated with FDI; W. Jos Jansen et al. (2014),Found that more synchronized business cycles were associated with stronger FDI relations in the period 1995 to 2011, but not before 1995; James B. Ang (2009), Causality test found the bidirectional relationship between FDI and output growth. FDI and output are positively related in the long-run and Muhammad Shahzad Iqbal, et al. (2010),Bidirectional causality found between FDI and GDP, FDI and export, GDP and export, and import and export.

1.3Government Policies towards FDI

India's policy towards FDI has gone through a number of phases. The government has initiated several policy measures to regulate FDI inflow. Though the chronological development of FDI policy over time is not strictly separable but it is convenient to divide the overall period into pre-liberalization and post -liberalization:[vii]

1.3.0Pre liberalization

After independence, India adopted the strategy of import substitution[viii]policy in the framework of development. During the industrialisation era import substation strategy highly focused on development of capability domestic firms. Therefore, foreign investors were allowed to fulfil the shortage of domestic capital as well as for technology assistance. They were assured of no restrictions on the remittances of profits and dividends, fair compensation in the event of acquisition.[ix] However, it was provided that, as a rule, the major interest in ownership and effective control would always be in Indian hands. While foreign exchange crisis developed towards the end of 1950s, FDI policy was further liberalised and offered incentives and concessions to the foreign investors. The government issued a list of industries in 1961 taking into account the gaps in capacity in relation to plan targets where foreign investments were to be welcomed. These included some of the industries earlier reserved for the public sector, such as drugs, aluminium, heavy electrical equipment, fertilizers and synthetic rubber.[x]

FDI concentrated on raw materials, service sector, tea plantation and jute industry. Over a quarter of first phase period, total FDI was contributing half of India's exports; about 32 percent in trading and other service, 9 percent in petroleum and only 2 percent in manufacturing other than jute[xi].The government policy was more restrictive towards FDI in late 1960s to protect the interest of domestic firms. Indian economy was following import

substitution policy till mid 1970s and imposed restriction on foreign investment to protect the domestic investors.

The domestic firms especially infant industries were inefficient to compete at international level and needed protection from foreign firms, a more precise policy towards FDI was adopted with below given features:

(a) Restrictions were imposed on FDI proposal without technical collaboration and those seeking more than 40 percent foreign ownership.

(b) Only technical collaboration requiring exclusive of Indian consultancy service were available.

(c) The renewals of foreign collaboration agreements were restricted.

(d) The government listed industries in which FDI was not considered desirable in view of availability of local capabilities.

Moreover, Foreign Exchange Regulating Act (FERA) of 1973 required all foreign companies operating in India to register under Indian corporate legislation with up to 40 percent foreign equity. Exceptions from the general limit of 40 percent were made only for companies operating in high priority or high technology sectors, tea plantations, or those producing predominantly for exports. It became the key to guiding and controlling FDI. The phase of tight regulation and selective policy was implemented by an administrative system based on discretionary power.

Towards the end of the 1970s, India's export-oriented firms were suffering in wake of second oil price shock, which further, deteriorated the foreign exchange position of India. Another problem for India's manufactured exports was that marketing channels in the

industrialized countries substantially dominated by MNCs. In comparison to them India's products were inferior. Since Indian goods were suffering from technological obsolescence, it evoked the government to change its attitude towards FDI. Therefore, it adopted more liberal attitude towards FDI and permitted to import technology and capital goods. However, after first oil shock, government adopted restrictive policy towards foreign investment, but after second oil shock, government policy was more favorable for FDI rather than to limiting it. The liberalization policy of 1980 and 1982 was an incentive for the foreign investor especially giving exception to foreign equity from FERA to 100 percent export oriented units. In addition, it was also decided to set up Export Processing Zone (EPZ) with the intention of increasing quantum of exports. During the period 1984-1985, 150 items and 200 types of capital goods were added to Open General License (OGL) list. Moreover, liberalization of industrial and trade policies was accompanied by an increasingly receptive attitude towards FDIs and foreign licensing collaborations.

1.3.1 Post Liberalization

There has been a paradigm shift in policies towards FDI with the adoption of industrial policy in 1991. One of the objectives of Industrial Policy was that foreign investment and technology collaboration will be welcomed to obtain higher technology; to increase exports as well as productivity capacity. The Industrial policy followed an open door policy on foreign investment and technology transfer. The new Industrial Policy market a major departure with respect to FDI policy with the abolition of industrial licensing system except where it is required for strategic or environmental ground, creation of a system of automatic clearance of FDI proposals fulfilling the conditions laid down, such as the ownership level of 50 percent, 51 percent,, 74 percent and 100 percent foreign equity and opening of new sectors such as mining, banking, insurance, telecommunication, construction and management of ports, harbours, roads and highways, airlines, and defence equipments to

foreign-owned companies subject to sectoral caps. The policy since then has been aimed at encouraging foreign investment particularly in core and infrastructure sectors. During this phase, favorable policy environment on the foreign investment, foreign technology collaboration, foreign trade and foreign exchange have been exerting positive influence on foreign firms decision on investment.

In 1999, FERA was replaced by Foreign Exchange Management Act. Government has permitted access to the automatic route for FDI, except a small list of sectors (detail given below). Moreover, companies with more than 40 percent of foreign equity are now treated at par with fully Indian owned company. New sectors such as mining, banking, telecommunications, highways, constructions, airports, hotels &tourism, courier and management has been opened for foreign investors. Even the defense industry sector opened up to 100 percent for Indian private investors with 26 percent FDI. In 2012, India allowed FDI in multi-brand retail and in civil aviation; Sectoral caps were revised upwards in 2013 in some sectors like telecom to 100 percent, in insurance to 49 percent, and in defence equipment beyond 26 percent on a case by case basis. In 2013, FII investments were reclassified as FPI which is subject to their holding in a company within 10 percent of its equity. Any holding beyond 10 percent will qualify as FDI[xii].

The inflow of FDI is reported under five broad heads such as,

(a) Reserve Bank of India's approval route for equity holdings up to 51 percent,

(b)Foreign Investment Boards' discretionary approval route for large projects with equity holding greater than 51 percent,

(c) Acquisition and approval route which is considered as a part of FDI since 1996,

(d) RBI's non residential Indian (NRI schemes)

(e) External commercial borrowings through ADRs and GDRs route;

1.4Statement of the problem

To the best of my knowledge few studies are found that explain the causal relationship of different macroeconomic variables of host country with foreign direct investment. James B. Ang (2009) found bidirectional relationship between FDI and output growth, FDI and output are positively related in the long-run. Muhammad Shahzad Iqbal et al. (2010) bidirectional causality found between FDI and GDP, FDI and export, GDP and export, and import and export. Casual relationship investigated between FDI and growth by many authors. Khan Gholam Syedain(2014),has not found causality between FDI and inflation in India. Contradictory, Tripathi Vanita et al (2012), found that the inflation granger caused by FDI inflow in case of India.Shu-Chen Chang (2006) has not found any significant association between unemployment and inflow of FDI. So there is need to investigate the casual relationship between FDI and macro variables with the help of this work. The proponents of FDI argue that FDI helps to promote economic growth through fluctuation in difference macro variables. Dua Pami et al. (1998) suggested that FDI have a positive effect on the economy. Despite amount of literature on the study, the relation of FDI with macro variables remains highly controversial due to wide variations lies among the countries with respect to the nature and availability of data, which make a cross-country comparison a risky business. Jong Il Choe (2003) said that it not necessary by the result of causality that the high FDI inflows or GDI rates lead to economic growth. The Impact of FDI and GDI on economic growth may differ among individual countries. Moreover, the policy towards FDI differs from country to country. India has adopted not only liberal attitude towards FDI but also giving much incentives to the foreign investors. In post liberalization period, India is achieving a significant economic growth in different macro variables. This raises an important question whether the government's policy towards FDI should continue in the interest of macroeconomic variables. Moreover, it needs to be examined whether FDI has

causal relationship with the macro variables. This study included the addition of different endogenous and exogenous macroeconomic variables to investigate the causal relationship with FDI inflow. Based on the above considerations, this study framed these objectives.

1.5Objectives of the study

This study has the following objectives:

1. To analyse the trends and behavior of FDI inflow and macroeconomic variables since 1991.
2. To estimate the short run and long run relationship between FDI inflow and macroeconomic variables in India.
3. To analyse the causal relationship between FDI inflow and endogenous macroeconomic variables.
4. To analyse the causal relationship between FDI inflow and exogenous macroeconomic variables.
5. To suggest the policies implications of study.

1.6Hypothesis of the study

H_o :FDI inflow does not cause inflation, unemployment and gap of growth output.

H_o : FDI inflow does not cause development expenditure and non-development expenditure.

H_o : FDI inflow does not cause gross fixed capital formation and gross domestic saving.

H_o : FDI inflow does not cause foreign reserve, annual exchange rate and trade openness.

H_o : FDI inflow does not cause net external assistance, net commercial borrowing, rupees debt services and net NRI deposits.

1.7Scope of the study

After economic reforms, India became one of the fastest growing economies in the world. The government evolved liberal policy towards FDI and gives some incentives in term of tax exemption to embrace sufficient level of foreign investment. This study is expected to throw light on government decision to allow FDI to go in right direction and achieve the targeted growth of aggregate variables.

1.8 Organization of the Study

The content of the present study on "FDI and Macro Variables in India: A Study of Bidirectional Relationship" have been organized into six chapters:

Chapter 1: Introduction and Background of the study focusing on the definition of variables, profile of FDI in India, statement of the problem, objectives of the study and hypothesis of the study.

Chapter 2: Review of literature: presents a deep analysis to point out the theoretical and empirical gaps if any, with the purpose of putting the present work in right prospective.

Chapter 3: Methodology: describes the methodology consisting of time series econometric techniques such as unit root tests, co-integration tests and vector error correction method and data source and description.

Chapter 4:This chapter describes the trends and behavior of Foreign Direct Investment inflow and macroeconomic variables.

Chapter 5: This chapter is based on econometrics methods to investigate the causal relationship between FDI & endogenous macroeconomic variables

Chapter 6:This chapter is also based on econometrics methods to investigate the causal relationship between FDI & exogenous macroeconomic variables

Chapter 7:Conclusion, policy suggestion, limitation and future perspective.

Chapter 2
Review of Literature

The present review of literature is dealing with the causal relationship between FDI and macroeconomic variables. Numerous empirical studies have been conducted to investigate. Whether, FDI inflow is influenced to Macroeconomic variables. The overall evidence is best characterized as mixed, as the results are regarding to the importance of labour costs, openness, investment climate, countries considered and fiscal incentives. Merely any study found that dealt with causal relationship between FDI and macroeconomic variables. Most of the studies are going on the effect of FDI on output, determinants of FDI, FDI and stock market etc. Review of literature is first supervisor which help to frame the research and generate ideas about the methodology to work on different variables. This chapter is divided into theoretical background of FDI, international studies and national studies. There are some efforts of review articles.

2.0 Review of literature

2.0.1 Theoretical background of Foreign Direct Investment

In the recent past, there is much literature showing that FDI can have positive effects on growth in the host country. Most of the literature consists of endogenous growth models that try to rectify the shortcomings of the traditional framework of growth.

Theory comparative advantage: David Ricardo developed the classical theory comparative advantage in 1817. It was assumed that factor of production are fully mobile within a nation but immobile between countries[xiii].

Neoclassical theory: This assumption carries over to the **Heckscher-Ohlin** model and most other theories of trade. Hecksher-Ohlin model introduced by the Samualson in 1941 explain the mobility of investment from countries with low marginal productivity of capital to the

countries with high marginal productivity of capital. It makes comparative advantage into an international theory, for without it regional comparative advantages within a nation would determine domestic trade in the same manner as foreign trade.

Eclectic Theory: Casson [xiv] and Buckely [xv] theory of internalization was extended theoretically and refined empirically before being further extended by John Dunning [xvi] in eclectic theory of international production, with its distinction between ownership and internalization advantages and its third element of location advantages, has become an integrating statement for the field of international business. It is, of course, a parallel approach to MNE theory; there is no major intellectual distinction between these two branches of the Reading School. Location theory suggest that the spatial allocation of plants and subsidiaries is determined by the costs of factor inputs in various regions, together with the transport costs involved in linking the production process with the firm's marketing strategy.

General Theory: Alan M. Rugman [xvii] faced criticism levelled against his statement that internalization theory is a 'general theory' of foreign direct investment [xviii]. However, it was more useful to view these debates as where the protagonists agree on 90 percent of the issues but like to debate the other 10 percent so that dialectic will push forward the frontier knowledge. Now international business is reaching a mature stage, with a high degree of consensus, but debates about the origins of internalization theory remain of interest to scholars in the field.

Theory of diversification: Stephen Hymer first demonstrated in his 1960 doctoral dissertation [xix], advantages can be one or more of several types: scale economies, managerial expertise, a technological or knowledge advantage, monopoly, product differentiation and

financial strength, where this includes the benefits of international diversification[xx]. Hymer also used a transaction costs framework.

Different models of growth as well as endogenous growth models provide the basis for most of the empirical work on the FDI-growth relationship[xxi]. The relationship has been studied by explaining four main channels[xxii]: determinants of growth[xxiii], determinant of FDI[xxiv], role of multinational firms in host country, and 'direction of causality between the two variables'[xxv]. Limited growth theory accredits to FDI, the endogenous growth literature points out that, FDI can not only contribute to economic growth through capital formation and technology transfer but also do so through the augmentation of level of knowledge through labour training and skill acquisition. FDI is an important source of capital. It complements domestic private investment, and is usually associated with new job opportunities and enhancement of technology transfer and spill-over, human capital enhancement, and boosts overall economic growth in host countries[xxvi].

The most conclusive theoretical justification of FDI is provided by Dunning's Ownership, Location and Internationalization frame work. This elegant framework incorporates the necessary and sufficient condition for FDI and suggests that at any given point of time presence of ownership advantage, location advantages, and internationalization advantages, are essential for undertaking FDI. Following Ownership, Location and Internationalization, three basic conditions need to be satisfied for FDI. Thus the framework group determinants of FDI into supply side(ownership and internationalization) and demand side (location specific features).

A macroeconomic analysis of the effect of international capital movement or foreign investment was initiated by G.D.A.MacDougall[xxvii] and subsequently elaborated by Murray C.Kemp. This has opened a route towards a macroeconomic approach to the problem. When

capital moves freely between the countries of the world, marginal productivities of capital are equalized internationally; efficiency in the use of world resources improves; the output of the world increases, thus augmenting welfare of individual countries. Assume a world composed of an investing country and a host country. Before international capital movement takes place, the marginal productivity of capital in the investing country is lower than that of the host country since capital is relatively abundant in the former. The law of diminishing marginal productivity is assumed for capital.

Neoclassical models of growth and endogenous growth models provide the basis for most of the empirical work on the FDI and growth relationship. This relationship has been studied by four ways. First, determinants of growth; second, determinants of FDI; third, role of multinational firms in host countries and last is the direction of causality between the two variables (Chowdhury and Mavrotas 2005).There are a wide variations lies among the countries with respect to the nature and availability of data, which make a cross-country comparison a risky business. Moreover, the policy towards FDI differs from country to country. Therefore, it needs a systematic time series analysis of individual country. The main objective of this study is to investigate the relationship between inflow of FDI and selected macroeconomic variables in India, using yearly time series observation. For the purpose the annual observations from 1990 to 2012 has been chosen to reveal the relationship between macroeconomic variables and FDI inflow.

2.0.2 Review of literature of international studies

Calvo Guillermo A.et al. (1993) discussed the principal facts, developments and policies that characterize the episode from 1985 to 1994 of capital inflow to Asia and Latin America. Tabulation and average methods has been used to discuss the causes of capital inflow on macroeconomic. They also suggested many policy implication and policy management frames for capital inflow. They also highlighted the Mexican balance of payment crisis of

1994. Capital inflow channeled to accumulation of foreign exchange reserve. Countries such as Brazil and Chile which had more modest current account deficits, recorded surpluses prior to the surge in inflows. Current account has usually involved both an increase in national investment and a fall in national saving. Investment ratios rose in most of these countries between 1990 and 1994, while the rate of saving declined in half of the countries considered.

Chung Chenet al.(1995) evaluated the policy of China toward foreign direct investment during the period from 1979 to 1993. They reviewed the different variables i.e. foreign loans, FDI, domestic saving, domestic investment, and the volume, sources, geographic distribution and composition of FDI were analyzed. Tabulation form of time series in percent method and regression analysis was used by authors. To investigate the contribution of FDI to Chin's rapid economic growth, it was necessary to analyze the behaviour and association among FDI , GNP and domestic investment. Annual data for 1968-1990 could be employed to conduct the analysis. Time series plots of those three variables indicate that all three series exhibit a clear increasing trend with respect to time. They found the presence of a positive relationship between foreign direct investment and economic growth although a much stronger positive relationship exists between domestic saving and growth. No evidence was found to support the critical view that FDI may have a negative effect on domestic saving. FDI shot up the inflation rate and external debt were in mild form beginning to period of this study.

Borensztein E.et al. (1997) tested the effect of foreign direct investment on economic growth. Secondary data collected from industrial counties to 69 developing countries over the period from 1979 to 1990. The results of study indicated that FDI has a positive overall effect on economic growth. The cross country regression also shown that FDI exerted a positive, though not strong, effect on domestic investment, presumably because the attraction of complementary activities dominates the displacement of domestic competitors. This is the indirect effect of FDI on macro environment. The most robust finding of that paper was that

the effect of FDI on economic growth was dependent on the level of human capital available in the host country. They also found some evidence of a crowding in effect, namely that FDI was complementary to domestic investment.

Goldberg L. and Kelin M. (1998) presented the findings on the linkages among foreign direct investment, trade flows and the real exchange rate, between developing countries and the United State and Japan. Time series data from 1978 to 1993-1994 was used in the regression consists of a cross section panel of annual data. Foreign direct investment by Japan and the United States to the East Asian countries significantly affected by bilateral real exchange rates. Trade between the countries United States and Japan significantly affected by foreign direct investment.

Mello Luiz R.de (1999) estimated the impact of foreign direct investment on capital accumulation, and output and total factor productivity growth in the recipient economy. Time series and panel data evidence were provided for a sample from OECD and non-OECD countries for the period 1970-90. Augmented Dickey-Fuller test and co-integration test were used to fulfill the objectives, and concluded that the FDI leads growth and has long run relationship in the recipient economy via technological upgrading and spillovers. It shown that the extent to which FDI was growth enhancing depend on degree of complementarities and substitution between FDI and domestic investment. In developing country FDI found as a complementary of domestic investment.

Riccardo Faini et al. (1999) suggested that the growth of multinational production cannot account for the fall in manufacturing employment, at least in Italy. They estimated the elasticity's of labour demand with respect to wage using a panel of 14 Italian manufacturing industries. They also computed the linear correlation coefficients and the Spearman's rank correlation coefficients between the estimated elasticity and a few measures of multinational

involvement and international integration. In the first stage, they used data for the period 1985-1995 to estimate a panel of 14 labour demand equations, one for each manufacturing sectors. They also used the simple error correction specification and regresses the change in labour quantities on real wages and on a measure of sectorial value added. The coefficient of correlation has indeed the expected positive sign. The spearman's rank correlation coefficient has higher and more significant when they measure globalization with the share of employees in foreign affiliates rather than with the degree of trade openness. Outward foreign direct investment has grown substantially in the 1990s. Their conclusion also found that the twin findings, Italy imports jobs through trade and exports them through foreign direct investments. The first fact mostly reflects the stance of macroeconomic policies, while the latter depends on basic factors such as comparative advantage and competitiveness.

Urmas Varblane, et al. (2000) examined the role of FDI in job creation and job preservation as well as their role in changing the structure of employment. Their analyses refer to Czech Republic, Hungary, Slovakia and Estonia from the period 1990 to 1998. Per capita FDI, share, central tendencies and correlation method were used to examine the objectives. They conclude that the FDI in employment creation had been most successful in Hungary and than in Estonia. Yet, FDI operate as complement rather than as substitute in employment generation. The bigger diversity of types of FDI was more favourable for the host economy, There was higher likelihood that it will lead to more diverse types of spillovers and skill transfers. This was important effects of the structure of FDI on employment in host economy.

Kevin Honglin Zhang (2001) investigated causality between FDI and economic growth for eleven developing countries of East Asia and Latin America. Data sourced from IMF, UNCTAD and World Investment Directory for different time period, i.e. 1960-97, 1980-97, 1987-97 and 1966-96. The study was based on econometrics and estimation method that has been developed fairly. Estimation work of the co-integration tests show that the long run

FDI-GDP links exists for five countries. The results of estimated models for the five countries indicated that FDI and GDP in two countries have some non significantresults and unidirectional causality was found for the other three countries. Six countries without FDI-GDP co-integration links, the conventional Granger causality test was conducted, which exist in one case, unidirectional causal effects were found for the remaining five countries. Major finding of this study was that patterns of FDI-growth links display significant difference between East Asia and Latin America, and the difference probably reflect the enormous cross national diversity in economic structures.

Elizabeth Asiedu (2002) explored whether factors that affect Foreign Direct Investment in developing countries affect countries in sub Saharan Africa differently. He also shed light on ways via which policy makers in Sub Saharan Africa can attract FDI. He started to analyse by determining the variables that were relevant in explaining the variation in FDI and GDP. He used ordinary least square for all the estimation for the panel and cross section data. Variables were averaged over the ten year period, 1988-97 for panel regression and averaged over three sub periods, 1988-90, 1991-93, 1994-97 for cross section regression. The results indicated that the factors that drive FDI to developing countries had a different impact on FDI to Sub Saharan Africa. Infrastructure development and higher return on capital promote FDI to non Sub Saharan Africa countries but not to Sub Saharan Africa countries. Openness also promote FDI, means trade liberalization will generate more FDI in non Sub Saharan Africa countries than Sub Saharan Africa countries.

Jong Il Choe (2003)examined in "Do Foreign Direct Investment and Gross Domestic Investment Promote Economic Growth?" the causal relationship between economic growth and FDI and GDI in 80 countries over the period 1971 to 1995. Data are taken from the World Bank's World Development Indicators. The variables are PGDPG, FDIY and INVY i.e. annual growth rate of per capita GDP at Market Prices based on constant, ratio of FDI

inflows to GDP and INVY is the GDI share in GDP respectively. These variables are constructed using the arithmetic averages over the periods 1971-75, 1975-79, 1979-83, 1983-87, 1987-91 and 1991-95. The reason for such five-years periods was to dilute cyclical influences and to maximize the number of sub periods. Some additional variables are calculated for openness, growth of labour force and stability of the macro economy with the help of standard deviation of percentage change in the GDP deflator. Conclusion of his study shown the effects are more apparent from growth to FDI than the FDI to growth. Finding suggests that the strong relationship between growth and FDI or GDI might have been caused by rapid economic growth leading to high FDI inflows or GDI rates.

David Deok et al. (2003) investigated empirical evidence on the relationship between inward foreign direct investment (FDI), economic growth and domestic investment in Korea. The study period is 1985-1999. They employed a vector autoregression model and the innovations accounting techniques, and explore dynamic interactions between inward FDI, domestic investment and output. They found that FDI has positive effects on economic growth, but its effects seem to be insignificant. On the other hand, economic growth was found to have statistically significant and highly persistent effects on the future of FDI. Although FDI is exogenous contemporaneously, they found that FDI shows strong endogeneity to domestic macroeconomic conditions, which has not been uncovered in previous works. Their finding does not support that the view, FDI crowds out domestic investment.

Choong Chee-Keong, et al. (2004) estimated the links between FDI and economic growth by including the development of the domestic financial sector. Data of three developed countries and selected Asian countries were taken from 1965s to 2000, employed unit root, co-integration, VAR and Granger Causality test. The results of the studyfound bidirectional causality between FDI and economic growth directly, but rather through their dynamic interaction with the development of the domestic financial sector. The results prove that the

presence of FDI inflows creates a positive technological diffusion in the long run. The short run causality depicts the similar behavior of FDI on economic growth across countries.

Akinlo A.Enisan (2004) investigated the impact of Foreign Direct Investment on economic growth in Nigeria. Secondary data period was taken from 1970 to 2001 and sourced from IMF, WB, Central Bank of Nigeria and African Development bank. Time series techniques i.e. unit root test, co-integration and ECM, were used to investigate. Variable were real output, private capital stock, stock of foreign investment, human capital, labour force, real export, budget balance, government consumption, and ratio of M2/GDP as proxy of financial development. ECM extracted that both private and foreign capital had not a statistically significant effect, on the economic growth. The results shown the argument that extractive FDI might not be growth enhancing as much as manufacturing FDI. Export has shown a positive and statistically significant effect on growth. Financial development has significant negative effect on growth, which might be due to high capital inflow. The result also suggested that the extractive FDI especially oil might not be growth enhancing as much as manufacturing.

Salehizadeh, Mehdi (2005) analyzed the contribution of FDI inflow in US. Study period over the year from 1980 to 2003. U.S. as recipient attracted more inflows of foreign direct investment (FDI) than any other economy.The study examined different categories of macro variables. Employment and wage measures of the US affiliates of foreign firms were analyzed. Their results shown a rising share of the American labour force as being employed by these affiliates, and that FDI inflows favour high-wage industries and sectors. Second, regression was estimated confirm the existence of a positive and significant relationship between FDI and US economic growth rates. The study founds as domestic savings lacking and running ever-rising current account deficits, it was imperative for the U.S. to continue to attract foreign capital, especially FDI.

Xiaoying Li and et al.(2005) investigated whether Foreign Direct Investment affects economic growth. They used Panel data of 84 countries over the period 1970-99. They used the growth equation, augmented regression test to check the endogeneity and unit root test to investigate the effect on FDI and Growth by different macro variables. The results of study depicts that the endogeneity between FDI and economic growth exist for the period 1985 to 1999. This study concluded that there were a strong complementary connection between FDI and economic growth in both developed and developing countries. There were a strong positive interaction effect of FDI with human capital and strong negative interaction effect of FDI with technology gap on economic growth in developing countries.

Fernando Seabra and Lisandra Flach (2005) investigated the nature of causal relationship between FDI and Profit remittance in Brazil. All the data sourced from the Brazilian Central Bank for the period 1979q1 to 2003q4. FDI and Profit remittance causal relationship investigate employed the method of unit root, Johansen co-integration and Toda-Yamamoto granger causality test. The result of the study found an indicated unidirectional causality from FDI to Profit outflows.

Chowdhury Abdur and et al. (2005) focused on the causal relationship between FDI and economic growth. They used the data period 1969-2000 for three developing countries i.e. Chile, Malaysia and Thailand. Each country has a different history of macroeconomic, policy regimes and growth patterns, thus they made a group for a comparative analysis. Toda-Yamamoto test for causality was used to study the direction of causality between the two variables. Data on FDI were taken from the World Bank and IMF. Data on GDP were taken from the various issues of the International Financial Statistics published by the IMF. Their empirical findings were that it was GDP that causes FDI in Chile and not vice versa. There was evidence of a bi-directional causality between GDP and FDI in Malaysia and Thailand.

Shan Jordan (2006) investigated statistical relationship between macro-variables and income inequality in China and the degree of causalityterms over the period 1955-98. The data sources were; China Statistical Yearbook, Market Statistical Yearbook of China and China Trade Union Statistical Yearbook.At first ensured stationarity of the log values than VAR model was estimated on macro variables such as money supply, FDI, unemployment, inflation, export and fiscal spending, using annual data in real terms. Export and FDI were important elements influencing income disparity in China. Causal relationships between external variables i.e. export and FDI and income disparity were weak and marginally significant. Means, export and FDI does not increase income disparity.

Sahoo Pravakar (2006) examined the impact of FDI on economic growth, domestic investment and export in South Asian countries during the period of the study was 1970 to 2003 for the variables , GDP, FDI as percent of GDP, gross domestic capital formation, labour force, real export, literacy rate, total trade and openness, and infrastructure indicator included, (the period of the study was 1975 to 2003). Annual secondary data was taken from World Bank. Regression method was used to check the impact of FDI on macro variables. A panel regression equation estimated with all relevant potential determinants of growth. Granger Causality test was performed to check the causal relationship. The study found that FDI has a significantly positive impact on growth for four south asian countries which support the hypothesis that FDI was more beneficial for the export-led growth economies of South Asia. Co-integration revealed that FDI and all its potential determinants have a long run equilibrium relationship. The study found that the market size, labour force growth, infrastructure and trade openness as an important determinants of FDI.

Jonathan E. Haskel et al. (2007) estimated their objective, the productivity spill overs from FDI to domestic firms. They used a plant-level panel covering U.K. manufacturing from 1973 to 1992. Consistent with spillovers, they estimated a robust and significantly positive

correlation between a domestic plant's TFP and the foreign-affiliate share of activity in that plant's industry. Typical estimates suggested that a 10-percentage-point increase in foreign presence in a U.K. industry raises the TFP of that industry's domestic plants by about 0.5%. Their estimates also to calculate the per-job value of these spillovers.

Jason Kiat (2007) investigated emerging market of South African. This country is considered to be one of the most attractive investment destinations, with an abundance of natural resources, a sophisticated financial market and a relatively stable political environment. Linear regression analysis was employed on economic data which collected from 1981 to 2007 for 30 countries, to determine the relationship between FDI inflow, economic growth, exchange rate and inflation. The research found that FDI inflows economic growth, but the reverse is inconclusive. This study also found that the Inflation has negative impact on FDI inflow and the effect of exchange rate was debated.

Huizhong Li et al. (2007) started from the contradiction between China's sustained growth in foreign direct investment (FDI) net inflow and deterioration of the terms of trade.This paper analyzed the characteristics of FDI sectoral structure since the 1990 to 2005. This paper gives a concrete analysis of the influence mechanism and concludes that the flowing of FDI into labour-intensive export sectors caused the deterioration of China's terms of trade. The study found that the terms of trade needs direct FDI inflow into capital- and technology-intensive sectors and service sectors to improve their terms of trade.

Tang Sumei, et al. (2008) investigated the relationshipamong Foreign Direct Investment, Domestic Investment and Gross Domestic Investment in China during the period from 1988 to 2003. They used the multivariate VAR system with the error correction model and time series techniques of co-integration and Granger causality test to investigate. The study concludes that the FDI plays an important role in complementing domestic investment in China; Economic growth spurs large domestic investment and vice versa; causal links

between GDI and Domestic Investment was bi-directional; and unidirectional causality from FDI to Domestic Investment and FDI to GDP.

Hazel Parcon(2008) analyzed the labour market flexibility,(measured by labour market standards and regulations), that effect the FDI inflows in two way. First, FDI inflows through the cost channel which decrease the FDI inflow. Second, FDI inflow has been strengthening the productivity channel. The sample area of this study has Japan and US for manufacturing and non-manufacturing sector. That study was also used the market flexibility indexes constructed by the Word Bank from a survey of business people in over 150 countries. The study found a non linear relationship between different indicators of labour market flexibility and FDI inflows revealed that of labour market standards and regulations may be attractive for foreign investors. The study concluded, that the foreign investment to and from different countries and in different sectors are affected differently by different aspects of labour market standards and regulations.

Samuel Adams (2009) examined the effect of FDI on domestic investment to examine whether FDI crowds in or crowds out domestic investment over the period from 1990 to 2003 with panel data set for 42 Sub Saharan Africa countries. Regression analysis was employed to examine the effect of FDI on the variable Stock of human capital, openness of the economy, gross domestic investment, consumption, inflation rate, political risk and geographical location. The results of the study foundthat the contemporaneous FDI has negatively correlated with economic growth and lagged form of FDI has positively correlated with economic growth; domestic investment has positive and significantly correlated with economic growth; FDI was negative and significantly correlated with domestic investment and positively correlated in lagged form.

James B. Ang (2009) examined the relationship between FDI and growth as well as financial development and growth in Malaysia over the period 1965 to 2004. Log form of the variables was used with the five dummy variables to estimate the oil crises, global recession, Asian financial crises and the world trade recession. Principal component method was used as the weights to construct the financial development index with econometrics methods.This study found that the FDI and output are positively related in the long-run. Financial development exerted a positive influence on output. Causality test found the bidirectional relationship between FDI and output growth.

Sayek Selin (2009) analyzed the Multinational Enterprises are able to shift investment between home and host countries to minimize the negative effects of changes in the macroeconomic environment. This study formalized a model that allows studying this investment –smoothing behavior of Multinational Enterprises facing inflation taxes in both the home and the host country. The study results suggested FDI has been used as a hedging tool, mitigating the effect of inflation taxes even if there are no formal hedging mechanisms. The investment-smoothing reaction of MNEs depends on the reason for investment, the financing sources of FDI, and substitutability between factors of production. This research concluded that the investment-smoothing possibility (FDI) reduces the real negative effects of inflation.

Muhammad Shahzad Iqbal, et al. (2010) investigated the causality relationship between Foreign Direct Investment, International Trade and Economic growth in Pakistan over the period 1988 to 2005. Data sourced from Pakistan's Statistical Yearbook of General Statistics Office. Unit Root test, Co-integration test and Granger Causality test in VECM were used to fulfil objective of their paper. Bidirectional causality was found between FDI and GDP, FDI and EXPORT, GDP and EXPORT, and IMPORT and EXPORT. This study concludes that FDI invested in Pakistan was attracted by its economic growth and its foreign n trade

strategy. FDI and trade were two important factors that enhance the affect of economic growth in Pakistan.

Arshad Muhammad (2012) studied the long run relationship among foreign direct investment , trade and economic growth for Pakistanover the period of 1965 to 2005. The results of the study indicate that trade significantly affect the inflow of FDI while relationship of FDI with GDP remains insignificant. Further the study found no significant relationship between export and FDI as well as in the FDI and Domestic investment.

Faiza Saleem et al. (2013) investigated the impact on Foreign Direct Investment due to the growth and inflation in Pakistan over the period 1990 to 2011. In this paper three variables was used namely FDI, GDP and inflation. To examine the impact of FDI on growth and inflation time series data, regression was used. The study concludes that there is a positive relationship exists between foreign direct investment and inflation and there exist a negative relationship between gross domestic product and foreign direct investment.

Jansen W. Jos et al. (2014) investigated the relationship between FDI and business cycle synchronization in the period 1982 to 2011 for eight industrialized countries. Data on FDI stocks was taken from International Direct Investment Statistics database maintained by the OECD for different sample period on its website. Estimation work is done by the help of regression and correlation analysis. The empirical literature on business cycle synchronization had focused on two dimensions of international economic interdependence. The first, dimension is international trade in goods and services, including specialization patterns. The second is international trade in financial assets, such as equity and bonds, and linkages among banking sectors. This study found that FDI stocks had become an essential aspect of International economic interdependence and that FDI constitutes a separate channel through which economics may affect each other, even with some time lag. The study also

found that more synchronized business cycles were associated with stronger FDI relations in the period 1995 to 2011.

2.0.3 Review of literature of national studies

Dua Pami et al. (1998) investigated the relationship between economic activity and foreign direct investment in India. Economic theory suggested that FDI can have a positive effect on the economy. They examined the relationship between FDI and Output in the post liberalisation period in the framework of a vector autoregressive model and Granger causality test. Monthly data on FDI approvals were available from 1992 onward while that for actual flows were only available since 1994. The paper highlights the comparison between the approvals of FDI and actual flows. FDI approvals can be treated as capturing the 'expectations' or 'sentiment' of foreign investors since approvals do not materialise until these are translated into actual flows. FDI approvals to proxy FDI flows since monthly data on actual flows were available for shorter time period. Index of Industrial Production was used as proxy of economic activity. Empirical conclusion found that the FDI approvals and actual flows have responded to the level of economic activity measured by industrial output. The evidence was inconclusive regarding the response of industrial production to FDI flows. Causality tests and innovation accounting analysis suggested that economic activity has yet to respond to actual flows while FDI approvals do affect output.

Purbava Yudhi Sadewa,(2000) investigated that the depreciation of currency of one country increases foreign direct investment flows. Their study is based on an option pricing approach. FDI flows data from Japan into the US suggest that the FDI flows may decrease as the currency of the host country depreciates. He choose between domestic production which for export and production in the foreign country. They examined the effect of exchange rate on the mode of operation of the firms. They found that depreciation in the currency of the host country will raises FDI flows from foreign firms only if initially the firms are mainly

exporting. After became multinationals, the depreciation in the currency of the host country may give different effect on the FDI flows. If the foreign firms have technological advantage, the currency depreciation reduces FDI flows from the foreign country. However, when the foreign firms have technological disadvantage, they will increase their FDI.

Sharma Kishor (2000) examined whether or not FDI has made any significant contribution to India's export growth. He used the variables, Export in different forms, Real Effective Exchange Rate (REER), Indian export prices relative to domestic prices, Foreign Direct Investment, and Gross Domestic Product. Models specified estimated annual secondary data taken from 1970 to 1998. They applied the hausman's specification test which indicates simultaneity bias the two-stage least squares (2SLS) procedure. He found that the demand for Indian export increased when its export prices fall relatively another countries export price, the real appreciation of the rupee adversely affects India's exports. Export supply was positively related to the domestic relative price of exports and higher domestic demand reduces export supply. Foreign investment appears to have statistically non-significant impact on export performance although the coefficient of FDI has positive sign.

Kohli Renu (2001) analyzed the effect of capital flow on macroeconomic in India. Her study is based on secondary data from 1985 to 1999. The study was divided into two parts with pre reform and post reform period to check the effect of capital flow on macroeconomic. Inflow of capital is measured in form of direct investment and portfolio investment. Capital Account's components were also considered in form of NRI Deposits, External Assistance, Commercial Borrowings and Global Depository Receipts in her working paper. She found effects of capital inflows are exchange rate appreciation, monetary expansion, rise in bank lending if the flows are intermediated through banks and effects upon savings and investment. She also observed trend in the bilateral in rupee-dollar, real and nominal,

effective exchange rates over three decades, NEER and REER are observed to be depreciating after 1985 and in 1993 the regime switch the nominal depreciation persists.

Balasubramanyam V N and Vidya Mahambare (2002) made an analytical review of India's needs and requirements, and India's potential for attracting large lows of FDI. Their paper was focused on post 1991 phase, efficacy of FDI was an effective mechanism and policy framework. Inflow of FDI increased appreciable during the nineties and FDI appears to have had an impact on growth, export and productive efficiency of Indian Industry. On the basis of review of vast literature there were those who argue that a lot more needs to be done and India should throw all doors wide open to FDI. FDI was a superb catalyst of growth and not an initiator, its efficacy in promoting development objectives was conditioned by the presence of co-operant factors in the host economies and it was most effective in countries which possess a threshold level of human capital.

Chakraborty Chandana & Parantap Basu (2002) has investigated the relationship among different variables. Three dummy variables have also been included in the study to capture the € different episodes of liberalization attempted by the Indian economy over the past two decades. They used the sample period of the analysis, 1974 to 1996 is divided into three distinct phases, 1980-84, the period immediately before liberalization; 1987-89, the period with liberalization in trade; and 1992-96, the period of comprehensive liberalization. Two co-integration relationships were then estimated between the four variables. The econometric analysis of the net FDI flow model for India suggests that there were existed, for India, two long run relationships between FDI, real GDP, unit labour cost and import duty. Econometrics modelling has indicated the long run relationship were existed among FDI, GDP, unit labour cost and share of import duty in total tax revenue. However, in the short-run, FDI flows were largely explained by real GDP which defines the size of the domestic market in India.

Mody Ashok et al. (2004) examined the foreign capital flows-domestic investment relationship for 60 developing over the period 1979 to 1999. Data sourced from World Development Indicators report and Global Development Finance report, and Word Bank's Country Policy Institutional Assessment Index which based on 20 indicators. The study used the panel annually and three years average. Regression method indicated that, on average, each dollar of long-run flows raised domestic investment by 66 cents in sample of countries. Short-run impact of a dollar of long term flows was to raise investment by between 32 and 44 cents. Real interest was negatively associated with investment which was reported in their paper. Paper's theoretical analysis shown, Financial integration allows agents to optimize their investment portfolios, and that may not involve increasing domestic investment. Conclusion suggested that the stronger policy environments strengthened the inflows of FDI.

Seth A.K. et al. (2007) examined the macro-economic impact of capital flows into India. The variables identified in the study have been drawn on the basis of the transmission mechanism to see how capital flows are transmitted into the economic system from 1991 to 2005. Macro environment is examined by the Exchange rate, exports, imports CPI and WPI, Capital flows, interest rates, money supply, trade and reserves on time series data basis. Regression, Engle and Granger co-integration and Granger Causality test have been used to examine the macroeconomic impact of capital flow. On the basis of their results the study concludes that capital flows have had a significant impact on the macroeconomic environment in the India in the post liberalization period. Capital flows have emerged as a significant explanatory variable of almost all financial and real variables that have been examined.

Palit Amitendu and Shounkie Nawani (2007), their studyinvestigated to explain the country-wise variations in the pattern of FDI flows to developing Asian economies by empirical identifying location specific features (demand side variables) influencing such flows. The study also attempts to study the main determinants of inward FDI into India. The

specifiedvariables and data sources for the 14 countries in their sample, they had obtained data on annual FDI inflows during the period 1993-2004 from the United Nations Conference on Trade and Development (UNCTAD) database. Their objective was fulfilled on inward FDI flows into a given sample of countries over a fixed period of time. Conclusion of this paper about FDI in developing Asia was export-oriented for the sample period. FDI seek to exploit some particular assets of host locations for producing exports for third-country market. The paper also found that with production processes becoming increasingly complex and technology-intensive, developing countries like India, must devote greater attention to the development of R&D and frontier technologies, failing which, they might lose out in the race for FDI.

Keshava S.R. (2008), worked on "The effect of FDI on India and Chines Economy ; A comparative analysis" is the comparative analysis of China and India to check the effect of FDI on an economy. The reference period of his study started from 1981 to 2004. Macro-economic variables namely export, private final consumption expenditure, foreign exchange, GDI, GDS, trade balance and balance of payment were taken to analyse the impact of FDI. Some key factors were also used to analyse the effect of FDI namely Hard Key Factors and Soft Key Factors, which are necessary to use the proper FDI. Since1990s China has been in front of the developing world and hence economic development. So India is still far behind China in becoming the attractive FDI destination, for the obvious reason such as power shortage, poor infrastructure, security consideration and absence of an exit policy etc.

Dasgupta Nandita (2009), examined the long run effect of international trade and investment related push factors-Indian exports, imports and FDI inflows on the outflows of FDI over the period 1970 to 2005. They analysed the possible economic association between export, import, FDI inflows and FDI outflows. They variables used are FDI flows as nominal FDI outflows deflated by nominal Gross Domestic Product level. Export, import and FDI inflows

are defined as the corresponding nominal flows deflated by the nominal levels of GDP. The study foundthat the unidirectional Granger Causality from export and import to FDI outflows but no causality exists from FDI inflows to the corresponding outflows from India. Their conclusion confirmed the assumption that lagged imports and exports are driving force to FDI outflows.

Vijaykumar N. et al. (2009) investigated the causal relationship between Foreign Direct Investment and Growth of BRICS countries. The different time dimension has been used in this study separately for each BRICS nation. The growth in this study has been measured in form of industrial productivity of the respective nations for the purpose of industrial productivity of India has been constructed. The causality has been measured by ADFTest, Johansen Co-integration test is used to check the existence of co-integration. Brazil alone co-integrated among the selected countries at level. Vector Error Correction Model employed to trace the existence of long run relationship. The result of the study state that the relationship between growth and FDI is bidirectional in Brazil, Russia and South Africa and FDI while it is unidirectionally in case of India and China.

Prasanna N. (2010) analyzed the impact of FDI on the export performance in India over the period of 1991 to 2007. Regression method was used to analyze the impact of FDI on export performance. Empirical finding concludes that the inward FDI has significantly contributed to better the export performance of India. Indian manufacturing did not contribute significantly in enhancing export performance during the same period. Impact of FDI inflows on export performance was significantly positive. The study also suggests that the policy regarding domestic efforts to enhance manufacturing exports needs reassessment in line with the FDI policy framework in order to reap maximum and long term benefits.

Jayachandran G. et al. (2010) investigated the causal relationship between Trade, Foreign Direct Investment and Economic Growth for India. Data on export, import, foreign trade deficit and FDI inflow were taken from Balance of Payment of India from 1970 to 2007. Time series econometrics methods were used to investigate the causal relationship. The study found the unidirectional relationship among economic growth rate, FDI and Exports were. According to him FDI and export in India was one of the factors affecting economic growth.

Agrawal Rahul et al. (2013) investigated the impact of Capital Flow in terms of Foreign Direct Investment on Macroeconomic Variables in India. Foreign Direct Investment flows are very crucial for an economy as they have spill-over effects on other macroeconomic variables which are equally important for the growth of the economy. The objective of study was to investigate the impact of global capital flows on major macroeconomic variables i.e. GDP, Inflation, exchange rate, trade openness, and terms of trade. His study focused on quarterly data of India from 1948 to 2010. The study concludes that the GDP, Inflation, Export, Import, Exchange rate, openness and terms of trade that contribute to the explanation of FDI in India by the help of unit root tests, regression and granger causality Test. The most important finding of the study has been the statistically significant role of lagged GDP growth rate in determining the capital flows for the next year.

Rohits (2014) studied the comparison between the exports from India to the world and export from China to the world. The study attempts to assess the impact of selected Indian and Chinese macroeconomic variables on the exports. Firstly, macroeconomic variables which put an impact on exports from any county were selected i.e. Gross Domestic Product, Foreign Direct Investment Inflow, Exchange Rate, Per Capita Real Income and Inflation. Secondary data from 2000 to 2012 collected from the official website of World Trade Organisation. Principal component analysis was used to prepare economic model from selected independent macroeconomic variables. In all selected macroeconomic variables GDP per

capita came out to be the most significant variables, which has positive relationship with the export. The study concludes that the Foreign Direct Investment inflows in India have significantly increased Chinese exports, reasons behind this phenomenon perhaps FDI inflows in India are enhancing export led industrial growth of China. The study also highlightthat the FDI inflows in China have shown positive but insignificant growth in Indian Export. Further, the results of study also suggests that the FDI inflow in India have shown negative and insignificant relationship with exports from India that means, India have contributed in the development of the export led industries. Therefore, India is trying to attract such FDI inflows in India which contributes in the development of export from India.

2.2Detailsurvey of empirical studies

Many empirical contributions have tried to explain the relationship between FDI and growth. A detailed literature survey on the FDI and Macro variables has been outlined in this section. As it can be seen in the most of these studies, FDI has analyised with limited macroeconomic variables mostly with output.

Table :2.1 Summery of articles

Sr. No.	Author and Year	Form of Data/Period	Methods	Findings
1	Calvo Guillermo A., et al. (1993),	Corss Section/ 1985 to 1994	Tabulation and Average	Capital inflow channeled to accumulation of foreign exchange reserve and increase national investment.
2	Chung Chen, et al. (1995)	Time series / 1979-1993	Share, Regression Analysis	a positive relationship between foreign direct investment and economic growth; stronger positive relationship exists between domestic saving and growth; FDI shot up the inflation rate and external debt were in mild form beginning to period.
3	Borensztein E., et al.	Cross Section	Regression	FDI has a positive

	(1997)	Data/ 1979 to 1990		overall effect on economic growth. FDI exerted a positive, though not strong, effect on domestic investment
4	Magnus Blomstrom et al. (1997)	Cross Section/1970-94	Regression	Employment was associated with Foreign production mainly among blue-collar workers (Manual Labour).
5	Dua Pami et al. , (1998)	Time Series/1992M to 1994M	VAR and Granger causality test	Causality test suggested that Economic activity has yet to respond to actual flows while FDI approvals do affect output.
6	Goldberg L. and Kelin M. (1998)	Cross section time series data/ 1978 to 1993-94	Regression Analysis	FDI significantly affected by real exchange rates
7	Riccardo Faini et al (1999)	Panel Data/ 1985-1995	Method of Elasticity, Correlation and Regression	Italy imports jobs through trade and exports them through foreign direct investments
8	Mello Luiz R.de (1999)	Time Series and Panel Data/ 1970-90	ADF, Co-integration	FDI found as a complementary of domestic investment
9	Urmas Varblane, et al. (2000)	Time series panel data/ 1990 to 1998	Central tendencies and correlation	FDI will lead to more diverse types of spillovers and skill transfers. This was important effects of the structure of FDI on employment in host economy.
10	Sharma Kishor (2000)	Time Series/1970 to 1998	Augmented Regression (Hausman 2SLS)	Foreign investment appears to have statistically no significant impact on export performance although the coefficient of FDI has Positive sign
11	Kohli Renu (2001)	Time Series/ 1985 to 1999	Trend and Correlation	Capital flows financed more investment than consumption. Current account deficit widened in correspondence with capital surge and

				capital flows are associated with real appreciation in India
12	Kevin Honglin Zhang (2001)	Time Series/ 1960-1997	Unit Root, Co-integration and Causality test	The long run FDI-GDP links exists with unidirectional and bidirectional relationship.
13	Chakraborty Chandana &et al. (2002)	Time Series/ 1974 to 1996	Johansen Co-integration and VECM	The long run relationship were existed among FDI, GDP, unit labour cost and share of import duty in total tax revenue. FDI flows were largely explained by real GDP
14	Balasubramanyam V N and et al. (2002)	Post 1991 Phase	Analytical Review	Inflow of FDI increased appreciable during the nineties and FDI appears to have had an impact on growth, export and productive efficiency of Indian Industry
15	Elizabeth Asiedu (2002)	Cross Section Data/ 1988-97	Regression and Average	Infrastructure development and higher return on capital promote FDI. Openness also promotes FDI.
16	David Deok et al. (2003)	Time Series/ 1985-1999	VAR and Granger Causality Test	FDI has some positive effects on economic growth. FDI shows strong dynamic endogeneity to domestic macroeconomic conditions. FDI does not crowds out domestic investment
17	Jong Il Choe (2003)	Panel Data / 1971 to 1995	Regression, VAR and Granger Causality tests	Strong relationship between growth and FDI or GDI might have been caused by rapid economic growth leading to high FDI inflows or GDI rates
18	David Deok-Ki Kim ,et al. (2003)	Time Series/ 1985 -1999	Unit Root, VAR and Causality Test	FDI has some positive effect on economic growth.FDI shows strong dynamic endogeneity to domestic macroeconomic conditions did not support that FDI crowds out Domestic Investment.
19	Akinlo A.Enisan	Time	Unit Root, Co-	FDI has a positive

	(2004)	Series/1970-2001	integration and ECM	effect on growth after a considerable lag, Private capital has insignificant positive effect on growth.
20	Mody Ashok et al. (2004)	Panel Data/ 1979 to 1999	Average and Regression	Real interest was negatively associated with investment. Liberalization attracted new flows, foreign capital stimulated less domestic investment
21	Choong Chee-Keong, et al. (2004)	Time Series/ 1965 to 2000	Unit Root, Co-integration , VAR and Granger Causality Test	FDI and economic growth were not co-integrated by themselves directly, but rather through their dynamic interaction with the development of the domestic financial sector.
22	Xiaoying Li and et al.(2005)	Panal Data/1970-1999	Simultaneous equation, augmented regression , unit root	Endogeneity does not exist in whole sample period and exist from the mid-1980s. FDI and economic growth become significantly complementary to each other and form an increasingly relationship.
23	Fernando Seabra (2005)	Time Series/ 1979-2003	Unit Root, Johansen Co-integration, and Toda and Yamamoto Granger Causality test	Unidirectional causality from FDI to Profit outflows
24	Salehizadeh, Mehdi (2005)	Time Series/1980-2003	Regression	American labour force as being employed by these affiliates, and that FDI inflows favour high-wage industries and sectors. Positive and significant relationship between FDI and US economic growth
25	Chowdhury Abdur and et al. (2005)	Time Series / 1969 to 2000	Unit Root, Toda-Yamamoto Causality test	GDP that causes FDI in Chile and not vice versa. Malaysia and Thailand, there was a strong evidence of a bi-directional causality between GDP and FDI.
26	Shan Jordan (2006)	Time Series/ 1955-98	Unit Root and VAR Model	Causal relationships between external variables i.e. export

				and FDI and income disparity were weak and marginally significant
27	Sahoo Pravakar (2006)	Panel Data/ 1970 to 2003	Regression, VAR and Granger Causality.	FDI and all its potential determinants have a long run equilibrium relationship. FDI was more beneficial for the export-led growth economies of South Asia.
28	Seth A.K. et al. (2007)	Time Series/ 1991 to 2005	Regression, Engle Granger co-integration and Granger Causality Test	Capital flows have had a significant impact on the macroeconomic environment.
29	Palit Amitendu and et al (2007)	Panal Data/ 1993-2004	On the basis of Analysis the data from UNCTAD	FDI in developing Asia was export-oriented.
30	Huizhong Li et al. (2007)	Panal Data/1990-2005	Sectoral Mechanism and analysis of intensive	Flowing of FDI into labour-intensive export sectors caused the deterioration of China's terms of trade.
31	Jason Kiat (2007)	Time Series / 1981-2007	Regression	Inflation was a negative impact, while the effect of exchange rate was debated
32	Jonathan E. Haskel et al (2007)	Panel Data/ 1973 to 1992	Correlation and Regression	Estimated a robust and significantly positive correlation between a domestic plant's TFP and the foreign-affiliate share of activity in that plant's industry and Creates jobs.
33	Keshava S.R., (2008)	Time Series/ 1981 to 2004	Regression, Ration and Average	India was still far behind China in becoming the attractive FDI destination, for the obvious reason of macro variables such as power shortage, poor infrastructure, security consideration and absence of an exit policy etc
34	Tnag Sumei et al. (2008)	Time Series / 1978 to 2004	Cointigration , VAR and Granger Causality	Domestic investment was complimentary with FDI; Domestic Investment and Growth Positively Correlated
35	Hazel Parcon(2008)	Single point of Time	Regression	Non linear relationship between different indicators of labour

				market flexibility and FDI inflow
36	Ajaga Elias et al. (2008)	Panel Data/ 1977-2001	Unit Root, Co-integration, VAR and Granger Causality	Bidirectional causality exists for FDI stock and monetary outcome variables as well as for FDI related employment and overall employment situation.
37	Vijaykumar N. et al. (2009)	Time Series/ Different Period for different country (1992 to 2007)	Unit root, Johansen Co-integration and VECM	Growth leads FDI bi-directionally for Brazil, Russia and South Africa and FDI leads growth uni-directionally for India and China respectively
38	Dasgupta Nandita (2009)	Time Series/ 1970 to 2005	Stationary, co-integration and granger causality tests	Causality from export and import to FDI outflows but no such causality exists from FDI inflows to the corresponding outflows.
39	Sayek Selin (2009)	Formulation of a Model	Derivation of System Equation, Vertical FDI and Horizontal FDI	Suggest FDI was used as a hedging tool, mitigating the effect of inflation taxes. Investment-smoothing reaction of MNEs depends on the reason for investment, the financing sources of FDI, and substitutability between factors of production
40	James B. Ang (2009)	Time Series/ 1965 to 2004	Unit Root, Johansen Co-integration , VAR, VECM and Engle and Granger Causality test	Causality test found the bidirectional relationship between FDI and output growth. FDI and output are positively related in the long-run.
41	Samuel Adams, (2009)	Cross Section Data/ 1990-2003	Regression	Domestic investment was positive and significantly correlated with economic growth. FDI was negative and significantly correlated with domestic investment and positively correlated in lagged form.
42	Prasanna N., (2010)	Time Series/ 1991-2006	Regression Analysis	Inward FDI has significantly contributed to better the export performance.

43	Himachalapathy R. ,(2010)	Time Series/ 1991 to 2008	Regression	FDI evaluated in terms of Economic Indicators such as GDP, GDP growth rate, Import Trade, Export Trade and Trade Openness which are the determinants.
44	Muhammad Shahzad Iqbalet al. (2010)	Time Series/ 1988 to 2005	Unit Root , Co-integration, Granger Causality test and VECM	Bidirectional causality found between FDI and GDP, FDI and EXPORT, GDP and EXPORT, and IMPORT and EXPORT
45	Jayachandran G. et al. (2010)	Time Series/ 1970 to 2007	Unit Root, Co-integration and Granger Causality test.	Direction of the relationship between economic growth rate, FDI and Exports were not reciprocal causality relationship.
46	Arshad Muhammad (2012)	Time Series/ 1965 to 2005	Co-integration, VAR and Granger Causality test	GDP cause FDI, FDI has not effected on domestic investment
47	Agrawal Rahul et al. (2013)	Time Series/ 1948 to 2010, Post 1991	Unit Root tests, Regression and Granger Causality Test	Statistically significant role of lagged GDP growth rate in determining the capital flows
48	Faiza Saleem et al (2013)	Time Series/1990 to 2011	Regression	Positive relationship exists between foreign direct investment and inflation and there exist a negative relationship between gross domestic product and foreign direct investment
49	Rohits (2014)	Time Series/2000 to 2012	Principal Component regression analysis	FDI inflows in China have shown positive. FDI inflows in India have shown negative and insignificant relationship with exports. India have contributed in the development of the export led industries
50	Jansen W. Jos et al. (2014)	Panel Data / 1982 to 2011	Regression and Correlation	Found that more synchronized business cycles were associated with stronger FDI relations in the period 1995 to 2011, but not before 1995

Chapter 3
Methodology

3.0 Introduction

The main objective of this study is to investigate the relationship between foreign direct investment and behavior of macroeconomic variables in India over the period of 1990 to 2013. The factors, those encourage or hinder international flows of capital can be categorized into those that are external to the economies receiving the flow and the factors internal to those economies. The magnitude and composition of inflow of FDI is determined by both external development and domestic economic factors (Calvo Guillermo A.et al. 1993). Countries with sound domestic fundamentals attracted capital on a large scale and with a higher proportion of long term investment. There appears to be a strong link between economic fundamentals and foreign direct investment (Edwards, Sebastian, 1991).

There are various econometric methods, measuring the empirical relationship between flow of FDI and macroeconomic variables as discussed in review of literature. As per the literature reviewed different kind of methods were used. Review of literature found that the most of researchers have used the econometrics methods i.e. Phillips Parron, Augmented Dickey-Fuller test and KPSS (Kwiatkowski, Phillips, Schmidt, and Shin) to check the stationarity; the Johansen co-integration method because this test confirms the number of co-integration equations for further procedure of analysis. VAR and VECM have been also used to check the long run relationship. Engle and Granger causality, Granger Causality, Toda Yamamoto and Granger sim tests were used by different researcher to investigate the causality. Some researcher used the correlation and regression method for relationship.

As the study deals with the time series data, it is required to check whether data is stationary or not. In this study we used the ADF and PP test to check whether unit root exists or not.

The difference between these tests, ADF and PP is the test of non-stationary and KPSS is the test of stationary. ADF and PP is more popular test of non-stationary. Johansen co-integration test is also used which confirm the existence of co-integration equations among variables. Therefore, VECM method is most appropriated to investigate the relationships among variables. Engle Granger causality test is used for two variable; Toda and Yamamoto causality test propose an interesting simple procedure requiring the estimation of an augmented VAR; granger sim which is opposite to granger causality test; and Granger Causality test is also used to measure the causality and it is popular and is used in empirical studies. Section 3.1 is the brief description for variables used in this study. Section 3.2 deals with the source of data, section 3.3 deals with the methods which has been used in this study.

3.1 Variables used in study

Aggregate production in the recipient economy is carried out by combining labour and physical capital. Physical capital can be domestic or foreign owned. FDI affects growth directly, by increasing the stock of physical capital in the recipient economy, as foreign owned capital is accumulated, and indirectly, by inducing human capital development and promoting technological upgrading. It is also important to evaluate the extent of complement and substitution between domestic investment and FDI because a simplistic Schumpeterian view of FDI related innovative investment that emphasis creative destruction through substitution may overlook the scope for complementarily between FDI and domestic investment. Under complementarily, innovations embodied in foreign investment may create, rather than reduce, rent accruing to older technology (Young, 1993).

Each variable has its own significance to evaluate the relation of exogenous and endogenous macroeconomic variables with inflow of foreign direct investment (FDIINFL).The negative macroeconomic environments discourage inflow of foreign direct investment, vice versa. The various macroeconomic variables and their relationship with inflow of FDI used in the

present study are outlined. Dua Pamiet al. (1998) found the causal relationship between economic activity and actual flows of FDI which affect output. Muhammad Shahzad Iqbal, et al. (2010) found bidirectional causality between FDI and GDP and W. Jos Jansen et al. (2014)found that more synchronized business cycles were associated with stronger FDI relations in the period 1995 to 2011.Kevin Honglin Zhang (2001) found long run FDI-GDP relationship. Kohli Renu (2001) concluded that the Capital flows financed more in investment than consumption. An effective inflation stabilization program can reduce macroeconomic risk and stimulate capital inflow and vice versa (Calvo Guillermo A. et al.1996). Role of FDI in employment creation is an important task; it is more successful and closely related to inflow of FDI per capita (Urmas Vablaneet al.2000). FDI inflow to developing countries increasing the employment for their skill in terms of quasi rent, higher expected employment by multinational has been associated with larger labour quasi rent increasing output (Joshua Aizenman, 2003). Shu-Chen Chang (2006) has not found any significant association between unemployment and inflow of FDI. Bosworth and Collins (1999) found that additional dollar of foreign direct investment is associated with a significant increase in domestic investment. Their findings further supported by Mody Ashoket al.(2002). Restriction on inflow of FDI exist, the level of domestic investment was constrained by available domestic saving (Mody Ashok and et al. 2002). Chung chen, et al.(1995) measured relationship between domestic saving and FDI and found that the effect of FDI on domestic saving was not statistically significant. Calvo Guillermo A. et al.(1996) found that the substantial portion of the surge in capital inflow has channeled to accumulation of foreign exchange reserve. Real exchange rate recorded negative association with inflow of FDI (Goldberg and Klein, 1998).Muhammad Shahzad Iqbal, et al. (2010) found bidirectional causality between FDI and export, GDP and export, and import and export. Elizabeth Asiedu (2002) found that trade openness also promotes FDI. Bajpai Nirupam et al. (2000) said that

commercial borrowing from NRIs became disaster that was the cause when lots of short term capital had come in and lots had moved out and created server payment crises. Investment promotion agencies help to terminate the external assistance by FDI inflow (Jacques Morisset, 2003).

In the present study depending upon the literature the following variables has been used in time series form with the addition of some more endogenous variables which has not been used earlier in Indian context i.e., GNP deflator (GNPDIFL) is used as a proxy of inflation. Okun's formulation of unemployment is used as a proxy of unemployment (UNOKUN).Unemployment as UNOKUN which shows the Phillips curve lies at the root of the aggregate supply curve and the two differs only in terms of gap between unemployment rates and output respectively, it is possible to write,

$U^* - U = \alpha ((y-y^*)/ y^*)$[xxviii] as Unemployment or UNOKUN

where α is a positive constant such that $\alpha = 1-U^*$.

Similarly, a close link has been established between changes in the unemployment rate over time and the deviation of actual output growth from the trend rate of growth. Okun(1983) formally quantified such a relationship which is now known as 'Okun's Law'. It can be written symbolically as;

$U-U_{-1} = -(1/q) (Gy-Gy^*)$[xxix] as GOG

where, q is Okun's parameter reflecting the cost of cyclical unemployment; and Gy and Gy* are respectively the actual and trend rates of output growth.

Development expenditure and non-development expenditure, gross domestic saving, gross fixed capital formation is also used.

Foreign reserve, annual exchange rate, trade openness and sources of foreign capital inflow are the components of capital account also used to check the relationship between inflows of FDI as exogenous macroeconomic variables. Component of capital account i.e., net external assistance, net commercial borrowing, rupee debt service and net NRI deposit which are also influenced on inflow of FDI.

Name of the variables which has been used in this study are gap of growth output as GOG, GNP deflator as GNPDIFL, Unemployment as OKUN, Foreign Reserve as FR, Exchange Rate as AER, Gross Fixed Capital Formation as GFCF[xxx], Gross Domestic Saving as GDS[xxxi], Development Expenditure as DE, Non-development Expenditure as NDE, Net[xxxii] External Assistance as NEA, Net Commercial Borrowing as NCB, Rupee Debt Service as RDS and Net NRI Deposit as NNRID.

3.2Source of Data

The nature of present study required the information from secondary source, for the purpose of all the data used in the present study has been collected from authentic and reliable resources including Reserve Bank of India. Okun's formulation of unemployment is used as a proxy of unemployment (UNOKUN) and data of unemployment is generated by the GNP.

3.3 Methods of the study

As discussed in the review of literature different methods has been used to investigate the relationship between macro variables with inflow of foreign direct investment. Unit Root Test, this situation is indicative of a problem of spurious or non-sense results. A test of stationarity(for non-stationarity) that has become widely popular in the unit root test is ADF and PP. Unit Root is measured by the help of Augmented Dicky-Fuller[xxxiii] Test for benchmarking purpose and Phillips Parron Test. Johanson Co-integration Test measure the

co-integrating equation among variables with the help of Trace and Max statistics and Normalized Equation which helps to analyse the long run positive and negative relationship. Vector Error Correction Model is also used to check the speed of adjustment towards equilibrium. Granger Causality test is used to investigate the causality.

3.3.0Test of Stationarity[xxxiv]

In this study we used the ADF and PP test to check the unit root exists in time series or not. ADF and PP is more popular test of non-stationary.

3.3.0.0Augmented Dicky-Fuller Test[xxxv]

The unit root tests described above are valid if the time series is well characterized by an AR(1) with white noise errors. Many time series, however, have a more complicated dynamic structure than is captured by a simple AR(1) model. Said and Dickey (1984) augment the basic autoregressive unit root test to accommodate general ARMA models with unknown orders and their test is referred to as the augmented dickey fuller test. The ADF test is conducted by estimating the following three models. In the present study, however, only last two i.e., equation (2) and (3) have been utilized.

No intercept no trend model

$$\Delta y_t=\gamma\, y_{t-1}+ \sum_{i=1}^{u} \beta_i \Delta y_{t-i} + \varepsilon_t \qquad \text{....3.1.1}$$

Intercept no-trend model

$$\Delta y_t=\alpha_0 + \gamma\, y_{t-1}+ \sum_{i=1}^{u} \beta_i \Delta y_{t-i} + \varepsilon_t \qquad \text{....3.1.2}$$

Intercept& trend model

$$\Delta y_t=\alpha_0 + \alpha_1 t+ \gamma y_{t-1} + \sum_{i=1}^{u} \beta_i \Delta y_{t-i} + \varepsilon_t \qquad \text{....3.1.3}$$

where $\Delta y_t = y_t + y_{t-1}$, is the first difference of the series y_t, $\Delta y_{t-1} = y_{t-1} + y_{t-2}$ is the first difference of y_{t-1} series etc. α & β are the parameters to be tested, ε_t is a stochastic disturbance terms. The difference between three equations, (1) to (3) is the exclusion or inclusion of the deterministic elements α_0 and α_1 equation (1) does not include the drift α_0 and time trend $\alpha_1 t$, equation (2) includes α_0 but no time trend and equation (3) includes both $\alpha_0 \& \alpha_1 t$. For carrying out the unit root test in the present study, however, we have confined ourselves to the last two models only.

In all cases the null hypothesis is,$\gamma=0$, the ADF test statistic is the t statistic for the lagged dependent variable. If the ADF statistical value is less than the critical value, then the null hypothesis of a unit root cannot accept and we can conclude that y_t series is a stationary and the order of integration is zero,I(0). The computed values of ADF statistics along with their corresponding critical values pertaining to two models are reported.

3.3.0.1Phillips-Parron Test[xxxvi]

Phillips and Perron (1988) developed a number of unit root tests that have become popular in the analysis of time series. The Phillips-Perron unit root tests differ from the ADF tests mainly in how they deal with serial correlation and heteroskedasticity in the errors. In particular, where the ADF tests use a parametric auto regression to approximate the ARMA structure of the errors in the test regression, the PP tests ignore any serial correlation in the test regression.The test regression for Phillips-Parron(PP) test in the AR(1) process

$$\Delta y_{t-1} = \alpha_0 + \beta y_{t-1} + \varepsilon_t \qquad \ldots 3.1.4$$

while ADF test corrects for higher order serial correlation by adding lagged differenced terms on the right hand side, the PP test makes a correction to the t statistic of the coefficient γ from AR(1) regression to account for the serial correlation in ε_t. So the PP statistics is just modification of ADF t-statistics. The asymptotic distribution of the PP t-statistic is the same

as the ADF, t statistics and therefore the same critical values are still applicable as with the ADF test. The PP test can be performed with inclusion of a constant, a constant and a linear trend or neither in the test regression. In the present study the PP test has been performed by including an intercept, and intercept and time trend only. i.e.

$$\Delta y_{t-1}=\alpha_0 + \beta y_{t-1} + \varepsilon_{1t} \quad \ldots 3.1.5$$

$$\Delta y_{t-1}=\alpha_0 + \alpha_{1t} + \beta y_{t-1} + \varepsilon_{2t} \quad \ldots 3.1.6$$

The PP-test is performed by testing the hypothesis of no stationarity (H_0:β=0) against the hypothesis that the series is integrated of order zero I(0) hence stationary. The computed PP statistics and corresponding critical values. If the computed values of PP-statistic is less than the corresponding critical value, then the null hypothesis of no stationarity cannot accept and hence the series is stationary. The unit roots with help of Phillips-Parron test. Parron test was conducted for two models i.e. intercept model as well as intercept and trend model. The series were tested at level, first difference and second difference.

The time series model requires determining the optimal lag length for the purpose Akaika Information Criterion (AIC) and Schwarz Information Criterion (SIC) are used in this study as the fixed lag by the automatic system generated in Eview.

3.3.1 Johnson Co integration Test[xxxvii]

In a two variable model there can be only one co integration vector. But when there are more than two variables in a model the number of co-integration vector can be more than one. In fact, for n number of variables there can be up to n-1 co-integrating vector. This problem cannot be resolved by the Engle-Granger single equation approach. We have three to five variables in our model. Johanson approach for multiple equations is adopted here.

At first stage, the study checks the integration order of the series. After that it employs Johanson Co-integration method [xxxviii] to investigate the relationship between inflow of foreign direct investment and macro variables.

It is well documented that most economic variables are non-stationary in their levels and becomes stationary on (Integrated of order(I)), I(1), I(2).

In present study we are using three to five variables. Johanson's test enables estimating and testing for the presence of multiple co-integration relationship, r, in a single step procedure. The numbers of co-integrated equations are identified with the help of trace and max statistics developed by Johnson. The statistics are formulated as:

$$\lambda_{trace}(r) = -T \sum_{i=r+1}^{n} (1 - r_i) \quad \ldots 3.2.1$$

And

$$\lambda_{max}(r, r + 1) = -T\,(1 - r_{r+1}) \quad \ldots 3.2.2$$

where:

r is the number of co-integrating vector under null hypothesis;

λ is the estimated value of r^{th} characteristic root(eigen value)

T is number of usable observations

When the appropriate values of r are clear these statistics are simply referred to as the λ_{trace} and λ_{max}.

The first statistic tests the null hypothesis that the number of distinct co-integration vector is less than or equal to r against a general alternative. From the previous discussion, it should be

clear that the λ_{trace} and λ_{max} equal to zero when all the λ i=0. The further the estimated characteristic roots are from zero, the more negative is $(1-\lambda_i)$ and larger is the λ_{trace} statistics.

The second statistic tests the null that the number of co-integrating vector is r against the alternative of (r+1) co-integrating vector. Again, if the estimated value of the characteristic root is close to zero, λ_{max} will be small.

It indicates that if there is one co-integrating equation for the given series. The result halts the presence of one co-integration relationship among the variables.

Having established the co-integration among the specified variables, short run behavior of these variables is investigated to serve the purpose, VECM model is employed.

3.3.2 Error Correction Model

One identifying the co-integration behavior among the specified variables, the short run dynamics is investigated using the Error Correction Model (ECM), co-integration general, an ECM derived from the Johanson test can be expressed as follows for chapter 5 and 6:

3.3.2.0 Equation for endogenous macroeconomic variables

$$\Delta \mathrm{FDIINFL_t} = \beta_0 + \sum_{i=1}^{n} \beta_1 \Delta \mathrm{GNPDIFL_{t-1}} + \sum_{i=1}^{n} \beta_2 \Delta \mathrm{UNOKUN_{t-1}} + \sum_{i=1}^{n} \beta_3 \Delta \mathrm{GOG_{t-1}} + \alpha \mathrm{ECM_{t-1}} + \mathrm{U_t} \ldots\ldots\ldots\ldots 3.3.1$$

Where

ECM=Error Correction Method

$FDIINFL_t$=Inflow of Foreign Direct Investment in year t;

$GNPDIFL_t$=Gross National Product Deflator in year t;

$UNOKUN_t$= Unemployment in year t;

GOG_t= Gap of output growth in year t.

β_0,β_1, β_2,β_3, and α are the parameters.

The error correction model result indicates the speed of adjustment back to long run equilibrium after a short run shock. The error correction term will explore feedback relationship among the variables like GNPDIFL, UNOKUN and GOG. While the parameters like α & β will explore short run influence of independent variables on FDIINFL dependent variable.

$$\Delta FDIINFL_t = \beta_0 + \sum_{i=1}^{n} \beta_1 \Delta DE_{t-1} + \sum_{i=1}^{n} \beta_2 \Delta NDE_{t-1} + \alpha ECM_{t-1} + U_t \ldots .3.3.2$$

Where

ECM=Error Correction Method

$FDIINFL_t$=Inflow of Foreign Direct Investment in year t;

DE_t=Development Expenditure in year t;

NDE_t= Non-development Expenditure in year t;

β_0,$\beta_1$and α are the parameters.

The error correction model result indicates the speed of adjustment back to long run equilibrium after a short run shock. The error correction term will explore feedback relationship among the variables like DE and NDE. While the parameters like α & β will explore short run influence of independent variables on FDIINFL dependent variable.

$$\Delta FDIINFL_t = \beta_0 + \sum_{i=1}^{n} \beta_1 \Delta GFCF_{t-1} + \sum_{i=1}^{n} \beta_2 \Delta GDS_{t-1} + \alpha ECM_{t-1} + U_t \ldots 3.3.4$$

Where

ECM=Error Correction Method

$FDIINFL_t$=Inflow of Foreign Direct Investment in year t;

$GFCF_t$=Gross Fixed Capital Formation in year t;

GDS_t= Gross Domestic Saving in year t;

β_0,$\beta_1$and α are the parameters.

The error correction model result indicates the speed of adjustment back to long run equilibrium after a short run shock. The error correction term will explore feedback relationship among the variables like GFCF and GDS. While the parameters like α & β will explore short run influence of independent variables on FDIINFL dependent variable.

3.3.2.1 Equation for exogenous macroeconomic variables

$$\Delta FDIINFL_t = \beta_0 + \sum_{i=1}^{n} \beta_1 \Delta FR_{t-1} + \sum_{i=1}^{n} \beta_2 \Delta AER_{t-1} + \sum_{i=1}^{n} \beta_3 \Delta OPEN_{t-1} + \alpha ECM_{t-1} + U_t \text{..3.3.5}$$

Where

ECM=Error Correction Method

$FDIINFL_t$=Inflow of Foreign Direct Investment in year t;

FR_t=Foreign Reserve in year t;

AER_t= Annual Exchange Rate in year t;

$OPEN_t$= Trade openness in year t.

β_0,β_1, β_2,β_3, and α are the parameters.

The error correction model result indicates the speed of adjustment back to long run equilibrium after a short run shock. The error correction term will explore feedback

relationship among the variables like FR, AER and OPEN. While the parameters like α & β will explore short run influence of independent variables on FDIINFL dependent variable.

$$\Delta \mathrm{FDIINFL}_t = \beta_0 + \sum_{i=1}^{n} \beta_1 \Delta \mathrm{NEA}_{t-1} + \sum_{i=1}^{n} \beta_2 \Delta \mathrm{NCB}_{t-1} + \sum_{i=1}^{n} \beta_3 \Delta \mathrm{RDS}_{t-1} + \sum_{i=1}^{n} \beta_3 \Delta \mathrm{NNRID}_{t-1} + \alpha \mathrm{ECM}_{t-1} + U_t \quad \ldots 3.3.6$$

Where

ECM=Error Correction Method

$FDIINFL_t$=Inflow of Foreign Direct Investment in year t;

NEA_t=Net External Assistance in year t;

NCB_t= Net Commercial Borrowing in year t;

RDS_t= Rupee Debts Service in year t;

NNRIDt= Net NRI Deposits in year t.

β_0,β_1, β_2,β_3, β_4 and α are the parameters.

The error correction model result indicates the speed of adjustment back to long run equilibrium after a short run shock. The error correction term will explore feedback relationship among the variables like NEA, NCB, RDS and NNRID. While the parameters like α & β will explore short run influence of independent variables on FDIINFL dependent variable.

The size and statistical significance of the coefficient of the ECM measures the tendencies of each variable to return to equilibrium. Choudry (1995), said that even if the coefficient of the lagged charges of the independent variables are not statistical significant, granger causality can still exist.

3.3.3 Granger Causality Tests[xxxix]

Granger (1969) developed a simple procedure for testing causality. According to this test a variable x_t is said to Granger-Cause y_t, if y_t can be predicted with greater accuracy by using past values of the x_t variable rather than not using such past values, all other terms remaining same.

The Granger-causality test for the case of one equation and two variables proceeds as follows:

First, $y_t$is regressed on lagged y terms as

$$y_t=\alpha_1+\sum_{j=1}^{m}\gamma_j y_{t-j}+ u_{1t} \quad \text{....3.4.1}$$

and find restricted residual sum of squares, RSS_R

Again y_t is regressed on lagged y terms plus lagged x terms as :

$$y_t=\alpha_1+\sum_{i=1}^{n}\beta_i x_{t-i}+ \sum_{j=1}^{m}\gamma_j y_{t-j} + u_{2\,t} \quad \text{....3.4.2}$$

and obtained unrestricted residual sum of squares, RSS_U,

then, $((RSS_R-RSS_U)/m)/(RSS_U/n-k)$ follows the Fm, n-k distribution, k=m+n+1.

The null hypothesis that x_t does not cause y_t ($\sum_{i=1}^{n}\beta_i=0$) cannot accept if the computed value of F-statistic exceeds the tabulated value at a specified level of significance.

Chapter 4
Trends of FDI inflow and macroeconomic variables

4.0 Introduction

The Indian economy faced many uncertainties in 1990's that were the impact of the political situation in our country. The persistent fiscal imbalances were accentuated by the Gulf crisis which intensified strains on an already adverse balance of payment position[xl]. International Monetary Fund required India to undertake a series of structural economic reform. As a result government started breakthrough reforms. It is a measure of the inherent strength of our economy that it withstood the effects of these shocks. India changed her direction in 1990s. India had initiated broader policies of reforms designed to increase her integration with the global economy[xli]. In 1991, New Industrial policy announced. A major departure with respect to FDI policy with the abolition of industrial licensing system except where it is required for strategic or environment grounds which have been discussed in first chapter in post liberalization regime.

4.1 Factors affecting the FDI inflow and Macroeconomic Variables in India

Broadly, the factors affecting the FDI inflow in any nation can be split into two categories.[xlii] First global push factors and, second country specific pull factors discussed below :

4.1.0 Global FDI Push Factors

Sr. No.	Global FDI Push Factors

1	**Growth in capital exporting countries:** The expected effect of economic growth of developed economies on foreign direct investment flows to emerging market economies is somewhat ambiguous, and income growth in developed economies provides an environment that is conducive to expansions into emerging markets and associated with easier financing conditions. It may also make investment in an economy relatively more advantages[xliii].
2	**Global Liquidity:** The effects of credit conditions in advanced countries on FDI flows have focused by different economies. Lower interest rates are possibly expected to increase FDI flows. It is making firms to finance projects easily[xliv].
3	**Global risk environment:** The international risk appetite is also mentioned in the literature as a common push factor which affects FDI flows to emerging market economies. VIX index which is used to capture the role of global risk on FDI inflow[xlv].

4.1.1 Country Specific Pull Factors

Sr. No.	Country Specific Pull Factors
1	**Size of an economy market:** The size of the economy market in the form of consumption plays an important role in attracting horizontal FDI. Investor will tend to invest in the host country to hold a share of the domestic market. Apart from size of market capital to labour ratio and productivity of capital are also influenced on FDI inflow[xlvi].
2	**Education:** Level of education in country also affects the inflow of FDI

	higher level of education provides the skilled labour to investors. Dunning (1993) argues, education and skill level of labour can influence both the volume of FDI. The activities that the MNC undertakes in an economy before investment[xlvii].
3	**Location:** This is also a factor for foreign direct investment. If the location is near to market and well developed infrastructure than it saves the transportation cost (Dunning, 1977 and 1988).
4	**Political Environment:** Impact on Foreign Direct Investment in a country is involved with the legal frame, political conditions and institutional environment. Law and order of legal frame, contract enforcement, and to protect the rights of investor are likely to be most important for an investor's decision reading, bringing capital into a foreign economy. Political instability and internal or external conflicts also play a role since they affect economic uncertainty. Safety of invested capital and economic prospects of the host economy is also important[xlviii]. Government stability and bureaucracy quality is also needed for host country to attract FDI. Domestic conflicts i.e. General Labour Strikes, Major Government Crises, Revolutions, and Anti Government Demonstrations are also factors which are highly sensitive for Foreign Direct Investment.
5	**Macroeconomic environment:** An important task in is the effects of macroeconomic variables on foreign direct investment is the feedback from FDI to macroeconomic variables. Those are economic growth, inflation rate, trade openness and exchange rate.
6	**Economic Policies:** This is also a challenge for FDI because investors

	always follow the favorable economic policies for trade, exchange rate and many other favorable economic policies. Limitation in capital account transactions linked with FDI and corporate tax rates (Keshava S.R., 2008).

Many studies have came on the simultaneously directions that the global push factors are important which explaining capital flows to emerging market economies. The role of domestic policies plays an important role to control the global push factors and promote favorable FDI policies. The role of global economic conditions has also gained importance. Because the recent global economic crisis subsequent declines FDI inflows.

4.2 Recent trends in inflow of FDI in India

Trends of FDI inflow is explained by growth rate (year on year) in table no.4.1 and behavior of FDI inflow is shown in figure 4.1.It shows that the higher growth rate of FDIINFL recorded in 1992-93, due to liberalization policy initiated by GOI in 1991. A negligible decline in the inflow is recorded in FDI during 1998-99 and 1999-2000. FDI inflow increased in 2000-2001 due to rupee depreciation along with further trade liberalizations, tariff reductions, and more openness to foreign investment in export oriented sector. Negligible decline in FDI inflow again recorded in 2002-03 due to poor performance in agricultural and terrorist attack in USA in 2001 and geo political conditions have been highly volatile with the standoff in Iraq. The pickup in FDI inflow recorded in 2006-07 due to a new industrial resurgence, modest inflation in spite of spiraling global crude prices[xlix]. Global uncertainty in advanced countries in 2008-09 also effect on FDI inflow from developed nations. In 2012-13, FDI inflow recorded a negative growth rate due to inflationary tendencies. Average of FDIINFL has been 592.08 Billion rupee. The value of

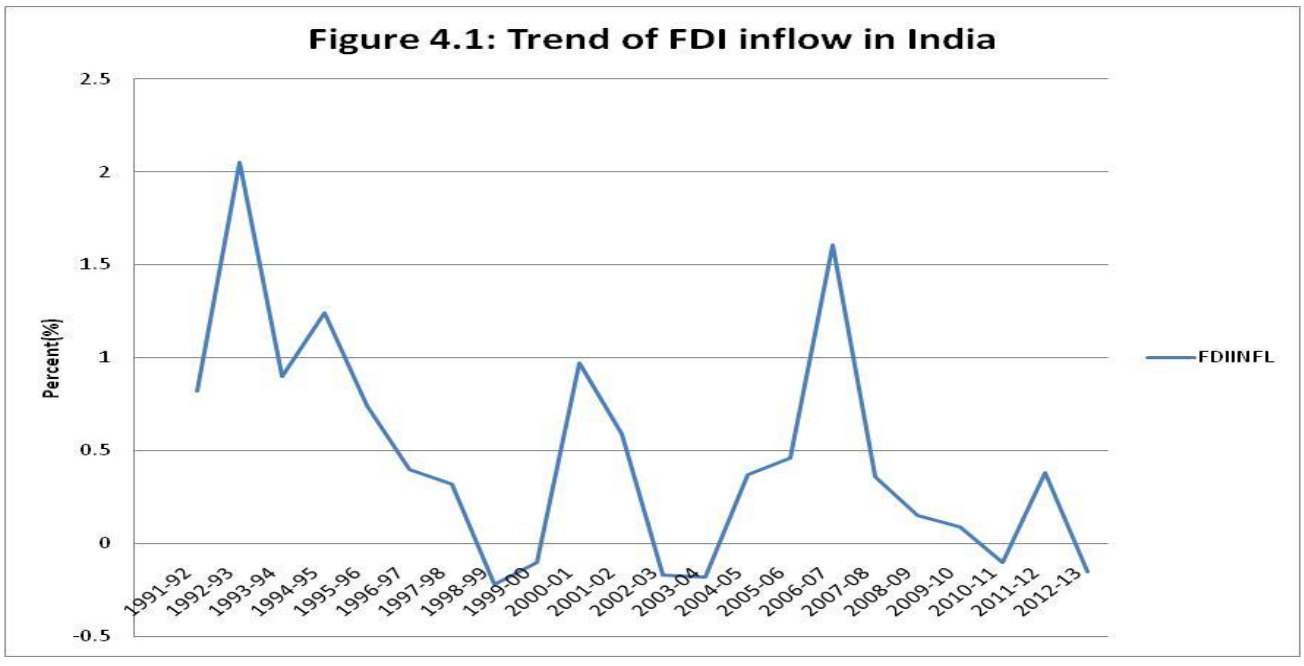
standard deviation of FDIINFL is 737.92 with the value of C .V. 1.25 (given in Appendix 4 with absolute figure of FDI inflow).

Table 4.1: FDI inflow in India(Growth Rate YoY)

Year	FDIINFL	Year	FDIINFL
1991-92	0.82	2002-03	-0.17
1992-93	2.05	2003-04	-0.18
1993-94	0.9	2004-05	0.37
1994-95	1.24	2005-06	0.46
1995-96	0.74	2006-07	1.61
1996-97	0.4	2007-08	0.36
1997-98	0.32	2008-09	0.15
1998-99	-0.22	2009-10	0.09
1999-00	-0.1	2010-11	-0.1
2000-01	0.97	2011-12	0.38
2001-02	0.59	2012-13	-0.15

Calculated by researcher

Sources: RBI, Handbook on Indian Economy



4.3 FDI inflow in India: Country wise total from 1992-93 to 2013-14

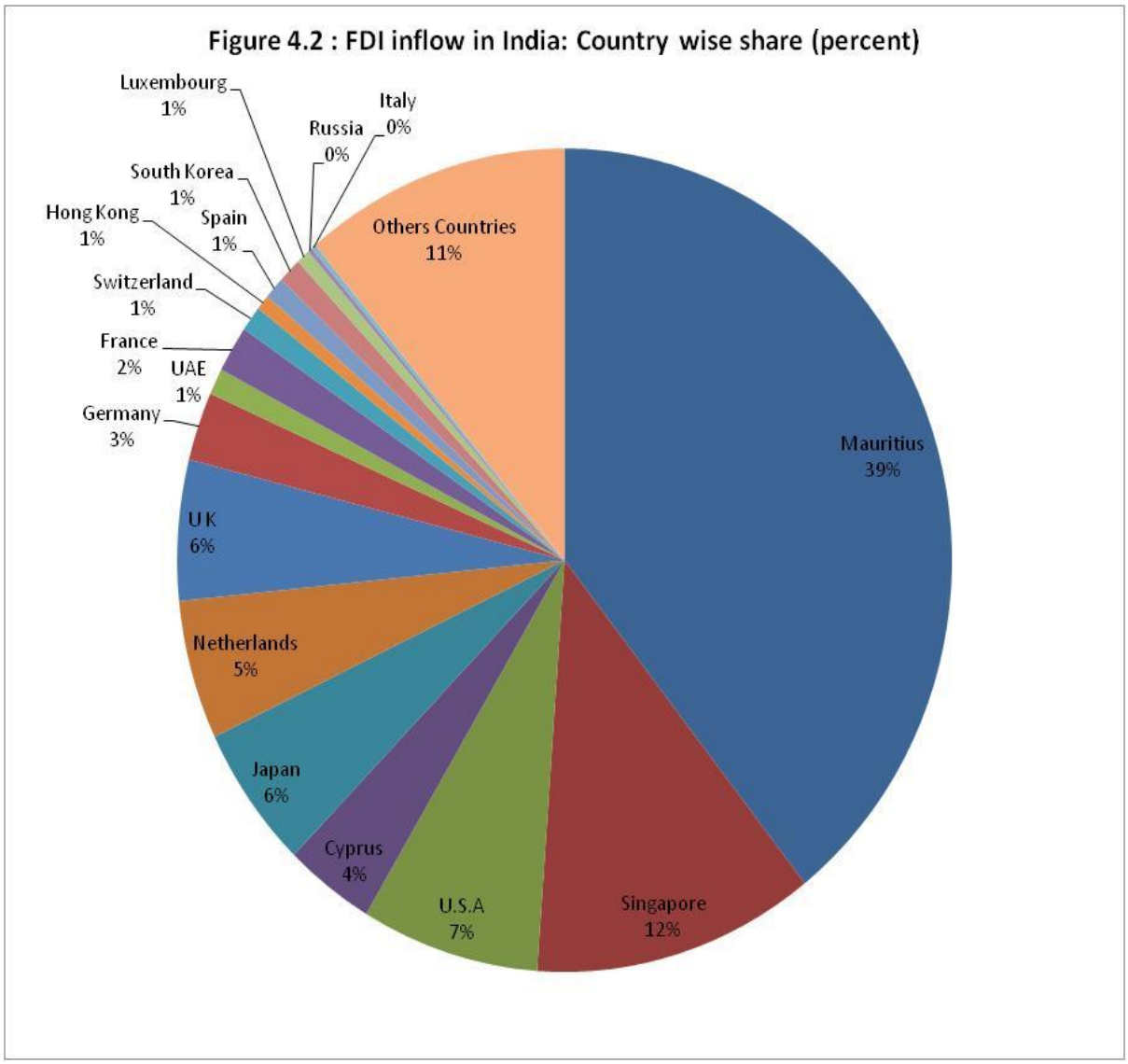
Since 1991, the FDI investors have been continuously increasing. There were only eight nations which invested in India during 1991 and which have increased by number fifteen during 2012. The number of investing countries has increased from eight to fifteen in 2012.Cyprus, UAE, Hongkong, Spain, Luxembourg, Russia and Italy emerged as new source of FDI since 2007-08. Three major investors' were USA, Japan and Switzerland in 1991-92. In 2013-14, Mauritius, Singapore, USA, Japan, Netherland, UK, Germany and France have been joined the group of resources for FDI investment in India. Country wise share of FDI inflow is shown in table 4.2. Figure 4.2 shows the relative contribution in total FDI in India by different nations since 1992-93. Figure depicts that Mauritius is the biggest resource of FDI inflow in India. The reason behind this must be good political relationship and tax regime since 1982. After that the major contribution in FDI inflow is by Singapore, USA, Japan, Netherland, UK and Germany have been major resources of FDI in India. To capture the annual growth rate of study period from different nations computed by CAGR. It shows in last row of table 4.2. Switzerland and South Korea recorded highest compound annual growth rate during the study period.

Table 4.2: Foreign Direct Investment inflow in India: Country wise share in Percent YoY

Year/ Countries	Mauritius	Singapore	U.S.A	Cyprus	Japan	Netherlands	U K	Germany	UAE	France	Switzerland	Hong Kong	Spain	South Korea	Luxembourg	Russia	Italy	Others Countries
1992-93	NA	1.07	7.86	NA	9.29	7.50	2.50	7.50	NA	3.21	12.50	NA	NA	NA	NA	NA	NA	48.57
1993-94	NA	2.48	24.50	NA	9.16	11.63	24.26	8.66	NA	2.48	5.69	NA	NA	NA	NA	NA	NA	11.14
1994-95	22.59	2.87	23.28	NA	10.89	5.16	47.13	4.01	NA	1.61	2.98	NA	NA	1.38	NA	NA	NA	8.72
1995-96	35.73	4.23	13.74	NA	4.30	3.52	5.00	7.05	NA	NA	NA	NA	NA	1.69	NA	NA	NA	24.74
1996-97	41.13	3.69	11.76	NA	4.72	6.03	2.63	8.07	NA	NA	NA	NA	NA	0.29	NA	NA	NA	21.68
1997-98	30.43	NA	23.23	NA	5.54	5.38	NA	5.10	NA	NA	NA	NA	NA	11.26	NA	NA	NA	19.00
1998-99	29.50	NA	22.65	NA	11.75	2.65	NA	5.70	NA	NA	NA	NA	NA	4.25	NA	NA	NA	23.50
1999-00	31.69	NA	22.45	NA	8.98	5.19	NA	1.96	NA	NA	NA	NA	NA	0.51	NA	NA	NA	29.22
2000-01	44.14	1.15	16.75	NA	8.17	3.98	3.19	5.92	NA	4.87	0.42	NA	NA	1.26	NA	NA	NA	10.16
2001-02	62.35	1.81	21.22	NA	4.79	2.28	1.51	2.48	NA	2.95	0.20	NA	NA	0.10	NA	NA	NA	9.37
2002-03	32.21	2.35	16.16	NA	3.98	5.67	13.51	6.21	NA	3.20	2.11	NA	NA	0.90	NA	NA	NA	13.69
2003-04	26.06	1.03	20.31	NA	4.58	13.47	10.74	4.72	NA	2.33	0.34	NA	NA	1.50	NA	NA	NA	14.91
2004-05	35.34	2.33	20.13	NA	5.26	8.45	3.62	6.16	NA	1.90	2.76	NA	NA	0.60	NA	NA	NA	12.93
2005-06	40.58	4.94	10.30	NA	2.56	1.49	7.77	1.34	NA	0.36	2.02	NA	NA	1.82	NA	NA	NA	26.82
2006-07	40.61	6.25	7.59	NA	0.86	6.01	19.44	1.25	NA	1.07	0.61	NA	NA	0.73	NA	0.27	0.61	15.58
2007-08	48.99	14.55	4.89	2.93	2.35	3.09	2.61	2.50	1.16	0.70	0.99	0.55	0.25	0.00	0.08	0.01	0.11	14.31
2008-09	44.79	14.80	5.45	5.34	1.17	3.00	3.04	2.69	1.03	1.93	0.59	0.67	1.60	0.42	0.10	1.35	1.10	13.37
2009-10	43.64	9.87	9.85	7.23	4.32	3.58	2.86	2.68	1.66	1.26	0.43	0.61	0.56	0.71	0.18	NA	NA	10.57
2010-11	37.59	10.31	7.17	3.82	8.41	9.49	3.60	1.09	1.26	3.25	0.89	1.40	1.22	0.91	1.66	NA	NA	7.93
2011-12	34.69	14.08	4.23	6.68	8.90	5.49	11.76	1.57	1.47	2.51	0.90	1.12	1.07	0.96	0.38	NA	NA	4.19
2012-13	44.07	8.78	2.61	2.27	7.33	9.30	5.59	2.55	0.95	2.99	1.47	0.36	1.90	1.22	0.19	NA	NA	8.42
2013-14 P	23.02	27.50	3.84	3.40	11.18	7.21	0.69	4.05	1.49	1.43	2.22	0.53	1.13	1.18	3.36	NA	NA	7.78
Total	**39.63**	**11.85**	**7.48**	**3.78**	**5.67**	**5.51**	**5.56**	**2.71**	**1.03**	**1.84**	**1.00**	**0.59**	**0.87**	**0.99**	**0.57**	**0.19**	**0.19**	**11.20**
CAGR (%)	**0.13**	**0.36**	**0.84**		**0.78**	**1.04**	**0.52**	**2.27**		**2.60**	**5.29**			**3.42**				**0.50**

P: Provisional. Note: Includes FDI through SIA/FIPB and RBI routes only. NA: Not Available

Source: Annual Report, Reserve Bank of India



4.4 Industry wise inflow of FDI in India

Highest FDI inflow is recorded in manufacturedsector followed by financial sector at 13.7 percent, construction at 9.70 percent and power sector at 5.43 percent share in total year on year respectively in table 4.3.Manufacturing sector has been pioneering the FDI inflow due to lower labour cost and big market for product (Rao K.S.Chalapati, et al. 2014). The top six sectors which have attracted the bulk of FDI inflow are Manufacturing, constructions, financial services, electricity and other energy generation distribution and transmissions, computer services and communication services, respectively share is given in table 4.3. The

share of education, research and development, trading, mining, transport and retail and wholesale trade is very low attracting sector for FDI in India are shown in figure 4.3. On the other side CAGR is highest in education, research and development, trading, mining respectively as shown in table 4.3.

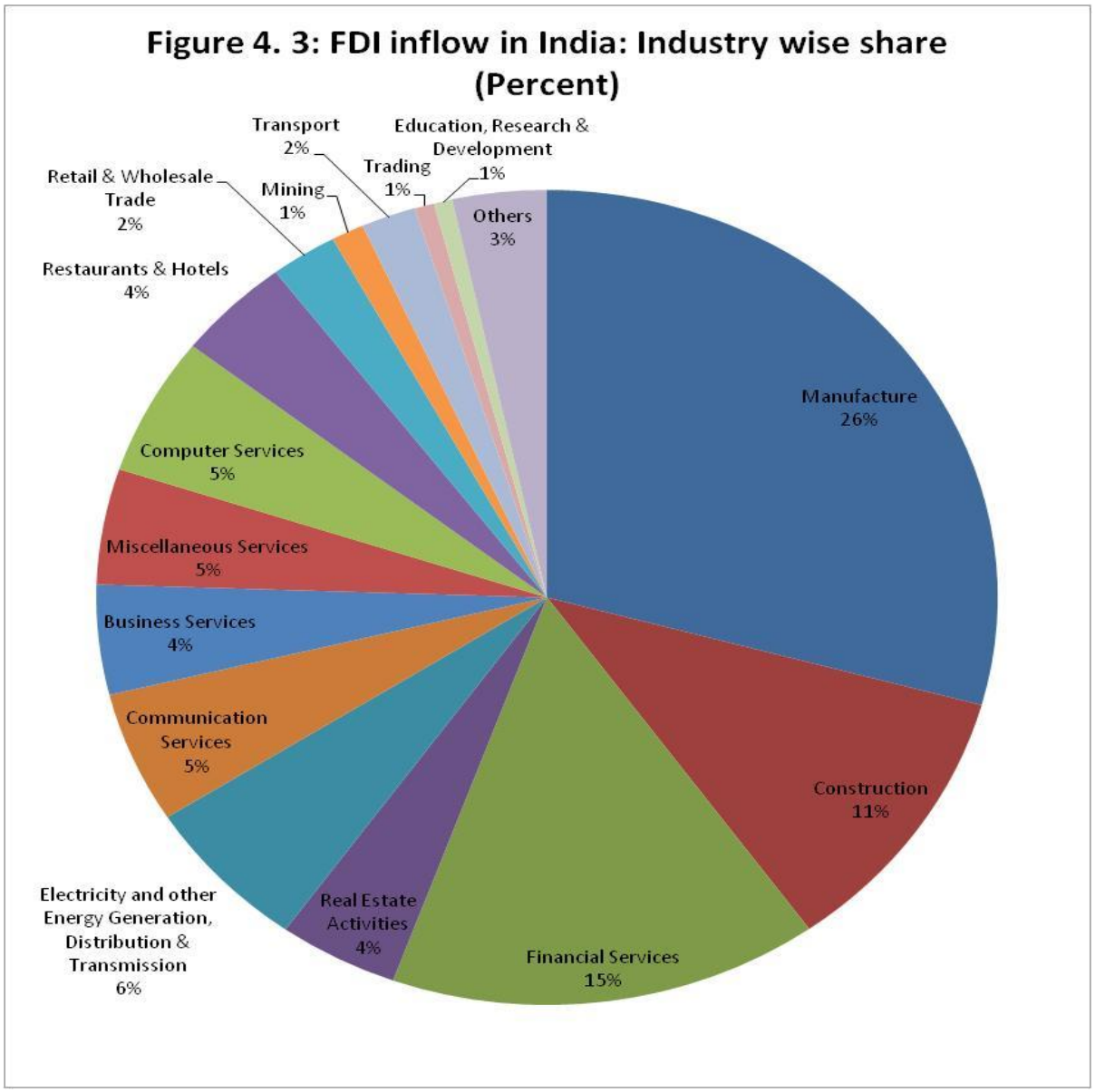


Table 4.3: Foreign Direct Investment inflow in India: Industry wise share in Percent YoY

Year/ Sector-wise Inflows	Manufacture	Construction	Financial Services	Real Estate Activities	Electricity and other Energy Generation, Distribution & Transmission	Communication Services	Business Services	Miscellaneous Services	Computer Services	Restaurants & Hotels	Retail & Wholesale Trade	Mining	Transport	Trading	Education, Research & Development	Others
2003-04	29.14	11.76	14.09	NA	6.16	NA	NA	NA	11.35	4.58	NA	0.14	1.37	NA	0.07	17.10
2004-05	39.83	9.01	15.65	NA	0.60	NA	NA	NA	16.03	0.95	NA	0.43	3.02	NA	0.30	6.72
2005-06	37.42	5.69	13.46	NA	2.47	NA	NA	NA	22.92	2.83	NA	0.83	1.96	NA	0.27	8.54
2006-07	17.30	10.40	47.45	NA	1.19	NA	NA	NA	8.84	2.98	NA	0.43	1.50	NA	1.04	9.20
2007-08	19.18	13.13	19.82	6.88	4.27	0.34	5.96	9.79	5.33	1.44	1.03	2.37	4.20	0.91	0.80	4.56
2008-09	21.05	9.86	19.52	8.31	2.95	9.11	2.83	6.42	7.26	1.51	1.30	0.46	1.77	1.76	1.07	4.83
2009-10	22.90	15.65	9.82	9.75	8.36	8.25	6.92	3.95	3.86	2.99	2.39	1.19	0.98	0.88	0.41	1.71
2010-11	32.08	10.70	9.06	2.97	8.96	8.22	3.81	3.41	5.64	1.46	2.62	3.96	2.30	1.04	0.37	3.39
2011-12	39.78	11.22	11.09	1.45	5.94	6.21	6.77	3.41	3.14	3.71	2.42	0.87	1.75	0.03	0.44	1.79
2012-13	35.70	7.21	15.09	1.08	9.04	0.50	3.52	3.02	1.35	17.11	3.01	0.38	1.16	0.77	0.82	0.24
2013-14 P	39.75	7.95	6.39	1.25	8.00	7.82	3.25	5.86	5.82	2.25	7.09	0.15	1.94	0.00	0.67	1.83
Total	**26.12**	**9.70**	**13.77**	**3.84**	**5.43**	**4.66**	**3.88**	**4.10**	**4.91**	**3.68**	**2.14**	**1.05**	**1.75**	**0.63**	**0.59**	**3.01**
CAGR (%)	**0.10**	**0.15**	**0.04**	**0.06**	**0.41**	**0.21**	**0.31**	**0.22**	**0.18**	**0.21**	**0.85**	**0.44**	**0.56**	**0.53**	**2.27**	**-0.09**

P: Provisional. Note: Includes FDI through SIA/FIPB and RBI routes only. NA: Not Available

Source: Annual Report, Reserve Bank of India

4.5 Recent trends in different macroeconomic variables of India

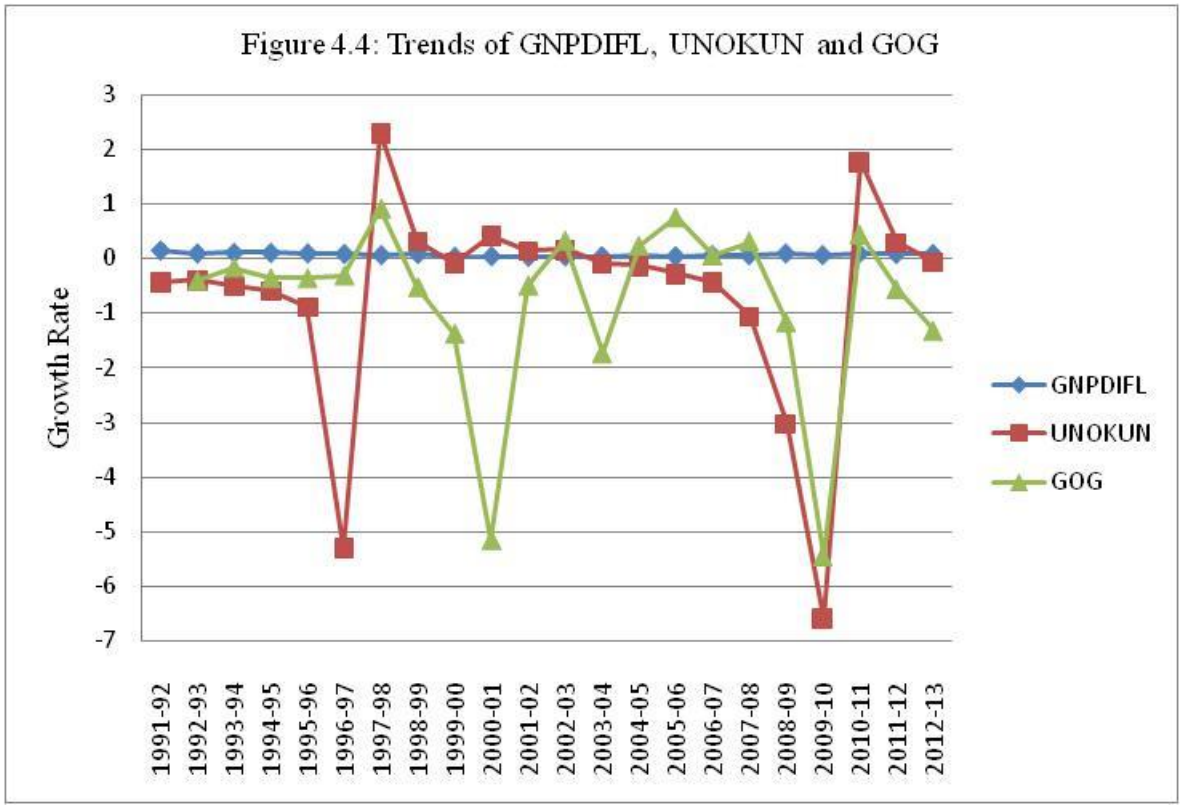
The economic crisis of 1991 stimulated the launch of globalization from the 1990s onwards. The position of different macroeconomic variables in 1991-1992, the market size in 1990-1991 according to GDP was 14876.15billion rupees; inflation index stood on point 0.39 with the highest inflation rate 14 percent; gap between output growths from its expected growth rate was largest; development expenditure and non-development expenditure was 586 and 493 billion rupees; reserve of foreign exchange was 114 billion rupees; exchange rate was 17.94 rupees per dollar; trade openness was also lowest with 12 percent of GDP; net external assistance, net commercial borrowing and net NRI deposit was 39, 40 and 27 billion rupees, respectively.

The picture of the Indian economy has been varying since 1991-1992. In 2012-2013, the inflation rate in India was 8 percent;while market size has folded four times;; development expenditure and non-development expenditure has been increased; foreign exchange reserve is 15884.20 billion rupees; annual exchange rate is 54 rupees per dollar; economy has opened in larger size compare than that period; net external assistance, net commercial borrowing and net NRI deposit has been controlled 69, 466 and 807 billion rupees respectively.

4.5.1Recent trends in endogenous Macroeconomic Variables of India

The trend and behavior of endogenous macroeconomic variables is measured in this section. Prices show the picture of economy in the form of demand, supply and monetary problems. In 1991, GNP Deflator as an indicator of inflation is 14 percent which was too much high. The fiscal crisis of 1991 was marked by deficits in government finances. Devaluation of the rupee was whopping inflation in Indian economy. In 1999-2000 and 2001-2002, inflation rate was 3 percent which was lowest.UNOKON shows the general level of unemployment and it was calculatedby the ratio of output gap. Highest unemployment was recorded in 1997-

1998in the study period and highly decline in this growth recorded 6.60 in 2009-10 due to fast-paced recovery of the economy.



Gap in output growth (GOG), growth rate of GOG was positive in 1997-98 due to increasing growth and declining inflation. Gap in output growth has been declined in 2009-10which shows the decline in the gap of output growth due to effectiveness of economic policies as shown in figure 4.4. The value of standard deviation is 0.037, 0.18 and 0.06showing less variation for GNPDIFL, UNOKUN and GOG respectively (given in Appendix 4).

Figure 4.5 highlightslowest growth was recorded for development expenditure in 1999-2000 which was negative. While, highest growth rate in 2008-09 due to some institutional foundation for faster development of physical infrastructure[l], progress in fiscal consolidation and launching of the NREGA scheme for inclusive growth. Average development expenditure is 2500.96 billion rupee with the 89 percent of c.v. which is highest variation in development expenditure.

Non-development expenditure was higher in 1993-94 in study period. While lowest growth rate of Non-development expenditure was in 2003-04 due. Average Non-development expenditure is 2630.86 billion rupee with c.v. 75 percent or .75, which is highest variation in non-development expenditure.

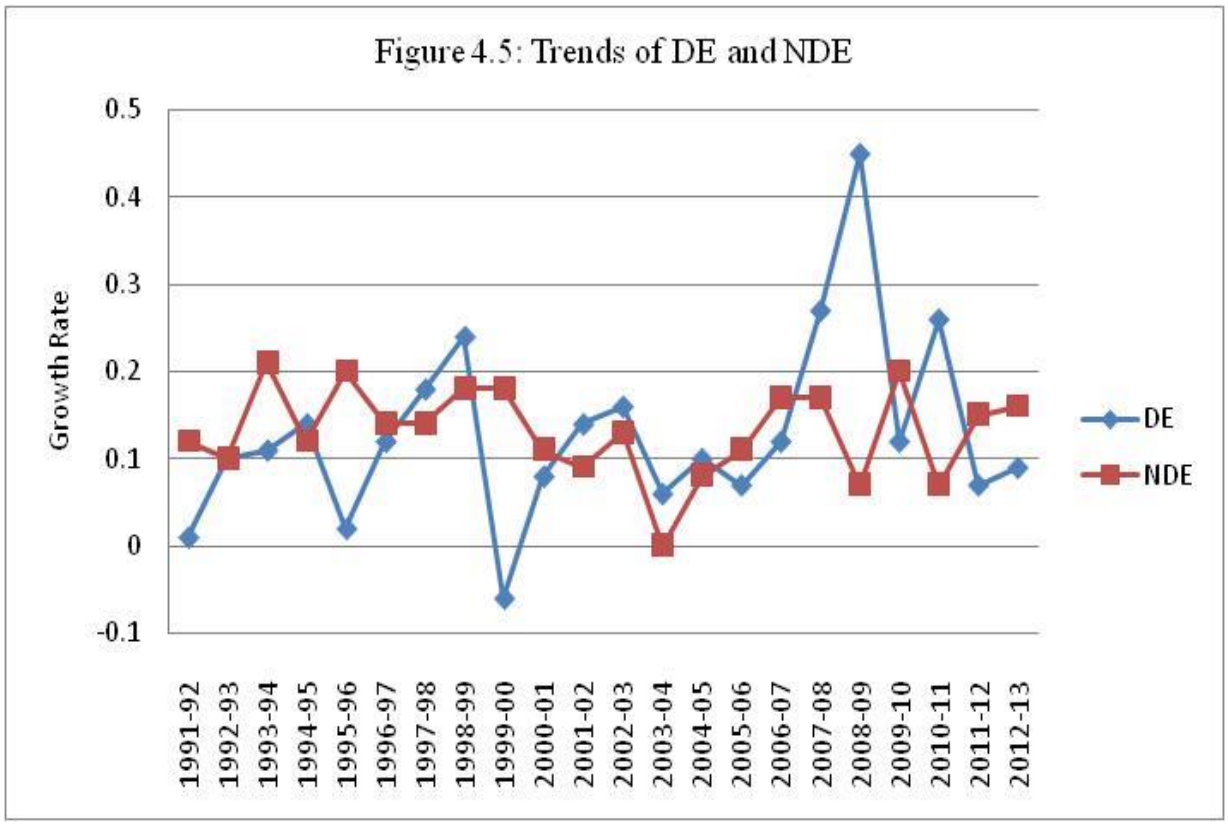
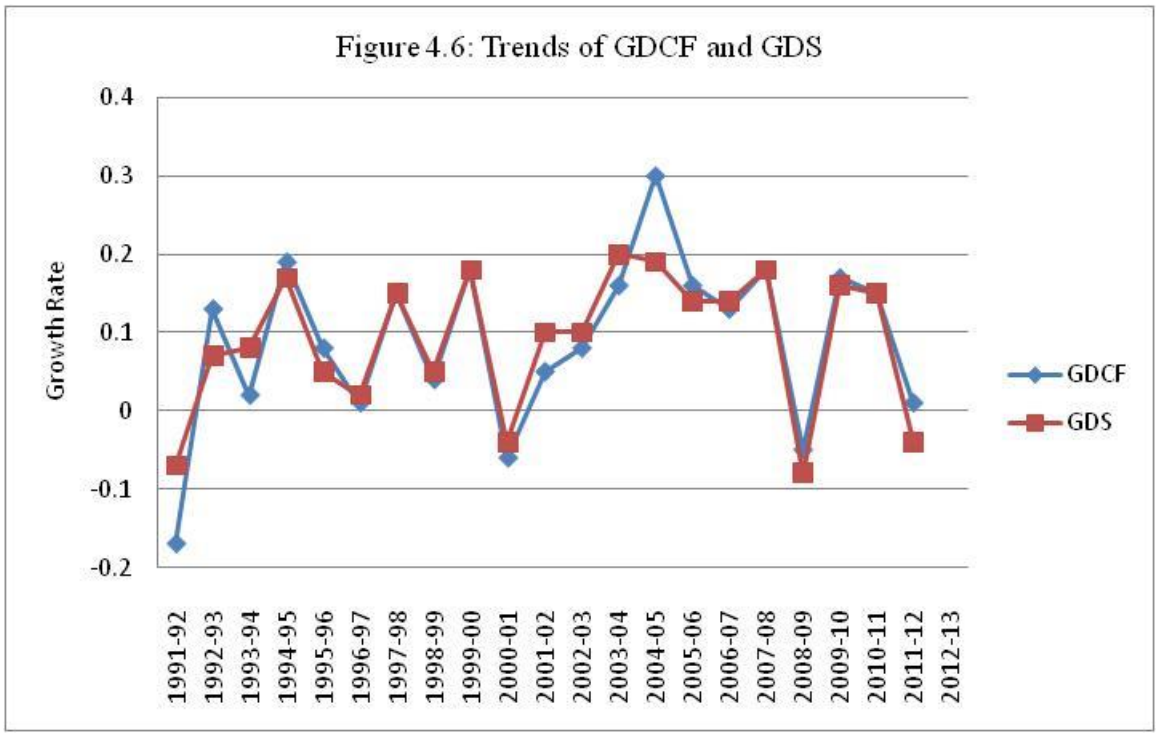


table 4.6shows that negative growth rate in gross domestic capital formation in 1991-92. While highest growth in gross domestic capital formation was recorded highest in 2004-05.This is also shown in figure 4.6.



Average of gross domestic capital formation for the study period is 9284 billion rupees with the value of c.v. is 64 percent which is higher than average variation.

Growth of GDS was recorded negative in 1991-92 as in table 4.6. Average gross domestic saving for the study period was 8845 billion rupees with the value of C.V. is 0.62 or 62 percent variation in GDS.

Table 4.4: Performance of selected endogenous Macroeconomic Variables in India(Growth Rate YoY)

Year	GNPDIFL	UNOKUN	GOG	DE	NDE	GDCF	GDS
1991-92	0.14	-0.44		0.01	0.12	-0.17	-0.07
1992-93	0.09	-0.4	-0.41	0.1	0.1	0.13	0.07
1993-94	0.1	-0.51	-0.17	0.11	0.21	0.02	0.08
1994-95	0.1	-0.6	-0.37	0.14	0.12	0.19	0.17
1995-96	0.09	-0.89	-0.37	0.02	0.2	0.08	0.05
1996-97	0.08	-5.3	-0.32	0.12	0.14	0.01	0.02
1997-98	0.06	2.3	0.9	0.18	0.14	0.15	0.15
1998-99	0.08	0.31	-0.53	0.24	0.18	0.04	0.05
1999-00	0.03	-0.09	-1.38	-0.06	0.18	0.18	0.18
2000-01	0.04	0.41	-5.15	0.08	0.11	-0.06	-0.04
2001-02	0.03	0.14	-0.5	0.14	0.09	0.05	0.1
2002-03	0.04	0.16	0.32	0.16	0.13	0.08	0.1
2003-04	0.04	-0.1	-1.74	0.06	0	0.16	0.2
2004-05	0.06	-0.14	0.22	0.1	0.08	0.3	0.19
2005-06	0.04	-0.29	0.74	0.07	0.11	0.16	0.14
2006-07	0.06	-0.44	0.05	0.12	0.17	0.13	0.14
2007-08	0.06	-1.06	0.3	0.27	0.17	0.18	0.18
2008-09	0.09	-3.03	-1.17	0.45	0.07	-0.05	-0.08
2009-10	0.06	-6.6	-5.45	0.12	0.2	0.17	0.16
2010-11	0.09	1.76	0.43	0.26	0.07	0.15	0.15
2011-12	0.08	0.29	-0.57	0.07	0.15	0.01	-0.04
2012-13	0.08	-0.07	-1.33	0.09	0.16		

Calculated by scholar

Source: Reserve Bank of India

4.5.2Recent trends in exogenous macroeconomic variables of India

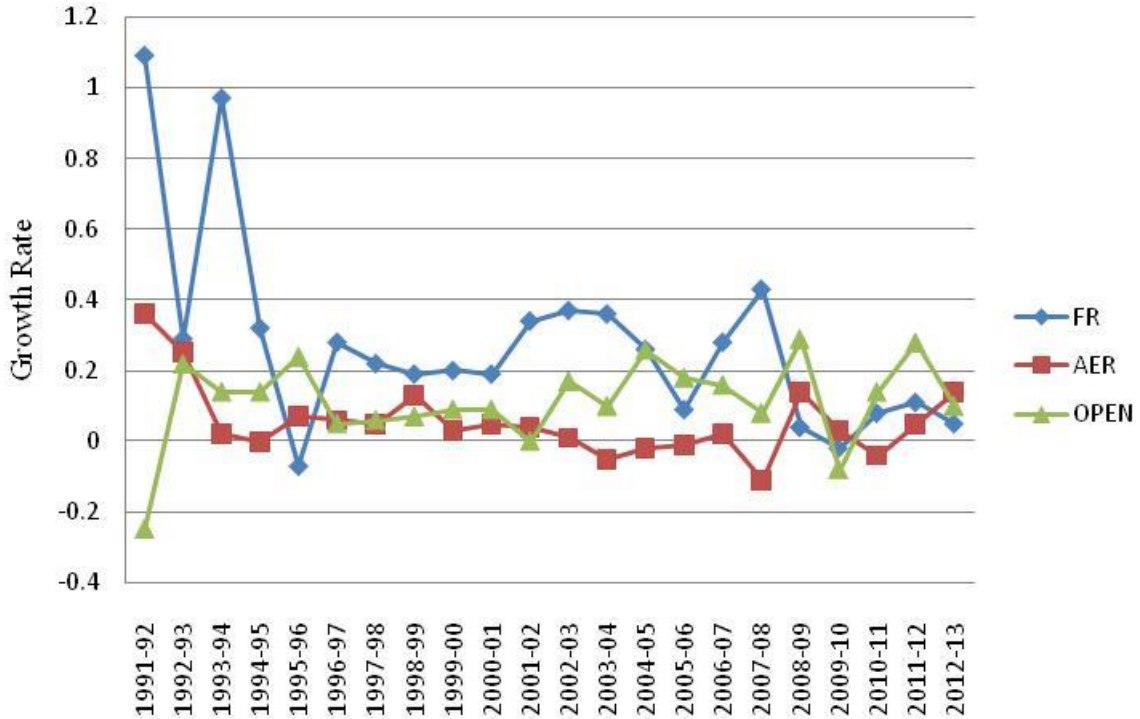
Foreign reserve, annual exchange rate, trade openness and the components of capital account as exogenous macroeconomic variables are used to study the trend and behavior.

Figure 4.5 shows the growth rate of foreign reserve, annual exchange rate and openness of a country for trade. The growth of foreign exchange reserve was highest in 1991-1992. While growth of foreign exchange reserve was recorded lowest in 2009-10.Annual exchange growth rate was also highest in 1991-92 due to devaluation of currency from 18 rupees per dollar to 24 rupees per dollar. While lowest growth rate recorded in 2007-08 due to appreciation of the rupee, a slowdown in the consumer goods segment of industry and infrastructure constraints.

Growth of openness of an economy was negative 25 percent in 1991-92 and growth of openness for trade has grown highest in 2008-09.Same has also been depicted by figure 4.5.

Average openness in economy was 0.42 with the value of standard deviation 0.33 and C.V. was 78 percent which is higher variation. Average foreign reserve was 5438.68 billion rupees during the study period with 5546.73 value of standard deviation. Coefficient of variation is 1.25 or 125 percent. Average exchange rate is 40.48 rupee for a dollar for the study period with the 22 percent value of C.V. (appendix 5).

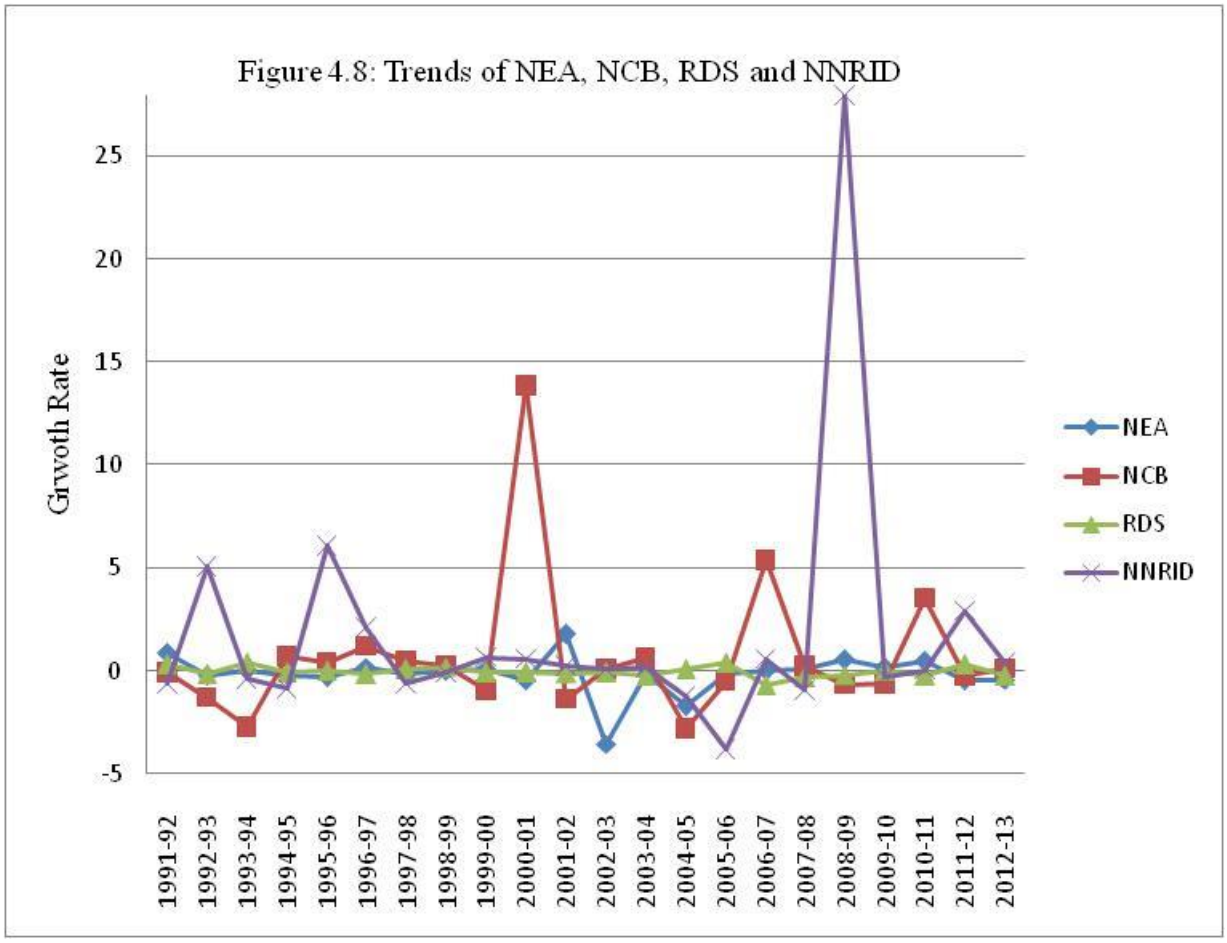
Figure 4.7: Trends of FR, AER and OPEN



Highest growth rate for Net External Assistance is recorded in 2001-02 due to several unfavorable domestic and external causes. While lowest negative growth was found in net external assistance in 2002-03. Trends are shown in figure 4.6.

Average Net External Assistance is 56.50 Billion Rupee for the study period with the 1.36 value of coefficient of variation.

Net commercial borrowing growth rate was highest in 2000-01 due to second phase reform policies towards trade, tariff reductions and more openness to foreign investment in export oriented sectors. While lowest growth rate was also noticed in net commercial borrowing in 2004-05 due to strong performance of US, China, Russia and Japan in output growth. Average net commercial borrowing has been 190.56 billionrupee with the 1.39 value of coefficient of variation which is higher variation in commercial borrowing.



Rupees debt services growth was highest in 1993-94. The stand-by arrangement with the IMF negotiated in 1991 was successfully completed in June 1993. While lowest value was found

in 2007-08. The value of C.V. is negative 0.57 which is average variation (given in the appendix 5).

NNRID shows the net NRI deposits which were highest in 2008-09 because the environment of India in this period was positive compared to advanced countries economy. While lowest value recorded for NNRID in 2005-06 due to macro obstacles i.e. global petroleum prices, deficient rainfall-induced inflationary expectations and monetary overhang from accretion of foreign exchange reserve. Average Net NRI deposit is 137.72 billion rupees for the study period with the 1.39 value of coefficient variation.

Table 4.5: Performance of selected exogenous Macroeconomic Variables in India(Growth Rate YoY)

Year	FR	AER	OPEN	NEA	NCB	RDS	NNRID
1991-92	1.09	0.36	-0.25	0.87	-0.06	0.3	-0.63
1992-93	0.29	0.25	0.22	-0.22	-1.29	-0.16	5.05
1993-94	0.97	0.02	0.14	0.04	-2.74	0.41	-0.38
1994-95	0.32	0	0.14	-0.2	0.7	-0.06	-0.86
1995-96	-0.07	0.07	0.24	-0.3	0.4	0	6.09
1996-97	0.28	0.06	0.05	0.19	1.2	-0.18	2.11
1997-98	0.22	0.05	0.06	-0.13	0.46	0.1	-0.64
1998-99	0.19	0.13	0.07	0.01	0.27	0.19	-0.06
1999-00	0.2	0.03	0.09	0.12	-0.93	-0.08	0.65
2000-01	0.19	0.05	0.09	-0.47	13.85	-0.1	0.57
2001-02	0.34	0.04	0	1.8	-1.37	-0.11	0.24
2002-03	0.37	0.01	0.17	-3.55	0.1	-0.06	0.1
2003-04	0.36	-0.05	0.1	-0.16	0.61	-0.24	0.17
2004-05	0.26	-0.02	0.26	-1.72	-2.82	0.06	-1.26
2005-06	0.09	-0.01	0.18	-0.12	-0.52	0.38	-3.81
2006-07	0.28	0.02	0.16	0.02	5.36	-0.72	0.57
2007-08	0.43	-0.11	0.08	0.06	0.23	-0.32	-0.96
2008-09	0.04	0.14	0.29	0.54	-0.66	-0.19	27.94
2009-10	-0.02	0.03	-0.08	0.17	-0.61	0	-0.29
2010-11	0.08	-0.04	0.14	0.48	3.53	-0.25	0.03
2011-12	0.11	0.05	0.28	-0.46	-0.22	0.33	2.93
2012-13	0.05	0.14	0.1	-0.43	0.11	-0.25	0.39

Calculated by scholar

Source: Reserve Bank of India

As table figure shows that the internal and external environment also influence on the growth figure of macroeconomic variables.

4.6 Summery of this chapter

Trend and behaviour of exogenous and endogenous macroeconomic variables are analysed by the tables of growth rates, share, and pie chart and figures. All the fluctuations occurred due to internal and external environment of economy and global push factors and country specific pull factors also effects the economic variables. Country wise FDI inflow is also analysed in this chapter and found that the number of big investor countries has increased from eight in 1991 to fifteen in 2012. Industry wise flow of FDI has been higher in manufacturing while highest annual growth rate is recorded in education and research and development sector. Fluctuation in growth rate of endogenous macroeconomic variables and exogenous macroeconomic variables are also recorded to show the trends of economic variables in different years. Most of the time global environment also has affected on the macroeconomic variables. The period of 1990-91, witnessed of the reform and the crucial stage of the Indian economy. Internal and external economic and political environment is also the reason for the fluctuation of macroeconomic variables as supported by Elif Arbatli (2011) and Keshava S.R. (2008).

Chapter: 5
Causal relationship between FDI & endogenous macroeconomic variables

5.1 Introduction

This chapter primarily focused to measure causal relationship of endogenous macroeconomic variables with FDI inflow in India. The various endogenous macroeconomic variables and their relationship with inflow of FDI used in the present study has discussed in the part of methodology. In the present study depending upon the literature the following variables has been used in time series with the addition of some more endogenous variables which has not been used earlier in Indian context i.e., GNP deflator (GNPDIFL) is used as a proxy of inflation, Okun's formulation of unemployment as a proxy of unemployment (UNOKUN) and gap of output growth (GOG). Development expenditure and non-development expenditure, gross domestic saving, gross fixed capital formation is also used. The objectives of this chapter mentioned in introduction are: to estimate the short run and long run relationship between FDI inflow and endogenous macroeconomic variables in India; and to analyse the causal relationship between FDI inflow and endogenous macroeconomic variables. Null hypothesis of this chapter are: FDI inflow does not cause inflow, unemployment and gap of output growth; FDI inflow does not cause development expenditure and non-development expenditure; FDI inflow does not cause gross fixed capital formation and gross domestic saving.

To achieve above mentioned objectives, econometrics methods has been used the unit root test of non stationarity, co-integration test, ECM method and granger causality test by the help of Eview.

5.1.0 FDI Inflow, Unemployment, Inflation and Gap of growth output

There are number of definitions about the relationship among the variable i.e.(FDIINFL) Inflow of Foreign Direct Investment, Inflation (GNPDIFL), Unemployment(UNOKUN) and Output Gap (which is gap of output growth (GOG)). Different researcher has attempted to explain the possible relationship between FDI inflow and different endogenous macroeconomic variable in different way. The findings of most of researcher (as discussed in literature) about these variables are:Inflation rate made negative impact on Inflow of FDI (Xiaoying Li and et al.2005);FDIINFL will help in bringing down inflation because FDIINFL improve supply side, further reduce inflation;Inflow of FDI and unemployment has not found any relationship (Shu-Chen Chang, 2006). Inflation and Unemployment is also the part of Phillips Curve and mix results are existing in literature about various economies. How FDI inflowhelps to bridge the gap of actual output and estimated output in economy? Therefore, it is required to check the causal relationship of inflow of foreign direct investment and unemployment, inflation and gap of output growth, respectively.

5.1.1 ADF Unit Root Test of stationarity

Table 5.1.1 shows the results of ADF test-statistics on level , 1st difference and 2nd difference for Intercept and Trend & Intercept model. The computed ADF test-statistics is compared with the critical value of t(tau). If the computed ADF test-statistics is smaller than the critical values of 'tau' then we cannot reject the Null Hypothesis. It means the series are stationary. It may be on 1%, 5% or 10% significant level.

The computed ADF test-statistics on intercept model for stationary are performed on level, 1st difference and 2nd difference (0.4802, -2.0745 and -3.5192 respectively). The value of 2nd difference is smaller than the critical vale of 'tau'. Therefore, we cannot reject Null Hypothesis on 5%level of significant for 2nd difference computed ADF test-statistics. It

means at 2nd difference FDIINFL series become stationary. The trend & intercept model value on 2nd difference are significant at 10% level of significance. It means the value of FDIINFL becomes stationary.

The computed ADF test-statistics is significant at 10% level of significance for the series GNPDIFL, UNOKUN and GOG, thus it means the series does not has an unit root problem and GNPDIFL, UNOKUN and GOG are stationary at 10% significant level. That means the 2nd difference of series becomes stationary. Therefore all the series are stationary integrated order of two, I(2) for ADF test-statistics in table 5.1.1.

Table 5.1.1: Augmented Dickey-Fuller Unit Root Test

Variables	Model	Level	1st Diff	2nd Diff
FDIINFL	Intercept	0.480	-2.074	-3.519**
	Trend & Intercept	-1.283	-2.30	-3.423***
GNPDIFL	Intercept	2.539	1.470	-2.900***
	Trend & Intercept	1.081	-0.066	-3.658***
UNOKUN	Intercept	-0.953	-3.340	-3.223**
	Trend & Intercept	-2.571	-2.722	-3.776**
GOG	Intercept	-2.861	-3.243**	-5.274*
	Trend & Intercept	-2.169	-3.973**	-5.071*

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

Critical values of 'tau' are given in appendix

5.1.2 PP Unit Root Test of stationarity

As the ADF Unit Root Test –statistics helps to check the stationarity and non stationarity of time series data. Phillips Parron test-statistics is also useful to check the stationarity and non stationarity without augmented term in the model of Intercept and Trend & Intercept. If the value of Phillips Parron is smaller than the critical value of 'tau', it means the time series does not have a unit root problem. It may be on 1%, 5% or 10% significant level.

Table 5.1.2 shows that the computed PP test-statistics is smaller than the critical vale of 'tau' which is indicated with *(star). It means the time series does not have unit root problem may be on 1%, 5% or 10% significant level. The computed PP test-statistics is smaller than the critical vale of 'tau' for UNOKUN and GOG on level. UNOKUN and GOG series are stationary to accept the Null Hypothesis. If the time series is stationary on level, I(1) then it will be stationary on 1^{st} difference and 2^{nd} difference. FDIINFL and GNPDIFL become stationary at 1% level of significant on 2^{nd} difference and FDIINFL is already significant on 1^{st} difference at Intercept and Trend & Intercept.

As the ADF test-statistics and PP test-statistics table 5.1.1 and 5.1.2 shows that all the series become stationary on I(2).Once variable have been classified as integrated of order I(0), I(1) and I(2) etc is possible to setup models that leads to stationary relation among the variables and where standard inference is possible. The necessary criteria for stationary among non-stationary variable is called co-integration. Johanson co-integration test has been employed to test whether there are long run relationship exits or not.

Table 5.1.2: Phillips-Parron Unit Root Test

Variables	Model	Level	1st Diff	2nd Diff
FDIINFL	Intercept	0.239	-4.431*	-8.095*
	Trend & Intercept	-1.592	-4.708*	-7.887*
GNPDIFL	Intercept	3.359	0.211	-7.277*
	Trend & Intercept	2.614	-1.455	-9.792*
UNOKUN	Intercept	-5.209*	-6.638*	-5.998*
	Trend & Intercept	-7.022*	-5.745*	-6.753*
GOG	Intercept	-4.440*	-5.575*	-11.124*
	Trend & Intercept	-3.441**	-6.562*	-10.704*

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

Critical values of 'tau' are given in appendix

5.1.3 Johanson Co-integration Test

Having confirmed the existence of unit roots for all time series, we employ co-integration technique of Johansen(1988) and Johansen and Juselius(1990) to test whether there exist a long-run relationship among variables. In the case of co-integration test, the null hypothesis can be detected by Johansen's maximum likelihood method. The None indicate the Null Hypothesis for no co-integrated equation. At most 1 indicates that there is one co-integrated equation or error term. At most 2 mean that there are two co-integrated equation.

On the basis of conitegration test trace statistics and maximum eigenvalue found the below given results. Trace statistics (76.07) is greater than critical value at 5% level of

significance which rejects the null hypothesis. Its mean there are co-integrated equation. P-value also shows the significance of co-integrated equations. The value of at most 1is also significant by the p-value and trace statistics (37.29) is greater than critical value. It means that the null hypothesis is not accepted to confirm the co-integrated equations. Trace Statistic indicates two co-integrated equation at 95% level of confidence. Trace statistics (15.34) is less than the critical value(15.49), we cannot reject the null hypothesis. It means that there is error term or all the variables are cointigrated and variables have long run association.

The result of trace statistics confirm by maximum eigenvalue test. Maximumeigenvalue test under the Johanson Co-integration test in table 5.1.3.shows the three cointegrating equations at 5% level of significance and shows 95% level of confidence. On the None hypothesis mean there is no co-integrated equation or error term. The max-Eigen statistics value (38.78) is greater than the critical value at 5% level of significance. It means that the null hypothesis cannot be accepted. At most 1 and at most 2 also shows the significant result to reject the null hypothesis at 5% significant level.

Johanson Co-integration test of Trace and Max confirms the long run association among FDIINFL, GNPDIFL, UNOKUN and GOG. Now it is necessary to check the VECM model it is discussed in the chapter of methodology of this study.

Table 5.1.3: Johanson Co-integration Test

Unrestricted Co-integration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.856	76.075	47.856	0.000
At most 1 *	0.666	37.290	29.797	0.005
At most 2	0.533	15.346	15.494	0.052
At most 3	0.005	0.100	3.841	0.750

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 Co-integration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.856	38.784	27.584	0.001
At most 1 *	0.666	21.943	21.131	0.038
At most 2 *	0.533	15.245	14.264	0.034
At most 3	0.005	0.100	3.841	0.750

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

5.1.4 Normalized Co-integration Equation

Table 5.1.4 :Normalized Co-integration Equation

Normalized cointegrating coefficients (standard error in parentheses)				
FDIINFL		GNPDIFL	UNOKUN	GOG
1.000	=	1759.336	24116.560	-28013.270
		(-1184.85)	(-3404.11)	(-33708.2)

Co-integrationequation ,

FDIINFL = 1759.33(GNPDIFL) + 24116.56(UNOKUN) – 28013.27(GOG) ….5.1

Moreover,according table 5.1.4.Normalizedco-integration has shown the long run associations or relationship among the FDIINFL, GNPDIFL, UNOKUN and GOG.

If sign is positive it means thatvariables move together in same direction or negative sign mean variable move in opposite direction in long run. Coefficient of GNPDIFL is insignificant seems to positive sign and coefficient of UNOKUN has positive sign with significant value. The coefficient of GOG is alsoinsignificant.

5.1.5 Vector Error Correction Model

The results of VECM revealed that the targeted model D(FDIINFL) has shown the error correction coefficient (-0.7226) for co-integration equations. All the dependent variables are converted in 1st difference by system during the estimation. There are requirements to check the significance of independent variables on lag one and lag two to explain the dependent variable. D(FDIINFL), D(GNPDIFL),D(UNOKUN) and D(GOG) are dependent variables. D(FDIINFL(-1)), D(FDIINFL(-2)), D(GNPDIFL(-1)), D(GNPDIFL(-2)),D(UNOKUN(-1)), D(UNOKUN(-2)),D(GOG(-1)) and D(GOG(-2)) are independent variables.

The error correction coefficients should be significant and negative Speed. Speed of adjustment towards equilibrium is 72%. Speed of adjustment in any disequilibrium towards long run equilibrium state is 72% which means that it is adjusting very fast toward long run equilibrium. The coefficient value of cointegrating equation is also significant for the long run adjustment towards equilibrium. Short run coefficients are also significant as shows in table 5.1.5.

Table 5.1.5: Vector Error Correction Estimates

Error Correction:	D(FDIINFL)	D(GNPDIFL)	D(UNOKUN)	D(GOG)
CointEq1	-0.722***	4.460	-8.845	7.765***
	-0.404	-4.500	-5.905	-6.405
	[-1.785]	[0.998]	[-1.510]	[1.206]
CointEq2	312.556	-0.066	0.228**	-0.207
	-686.95	-0.075	-0.099	-0.109
	[0.454]	[-0.876]	[2.298]	[-1.896]
CointEq3	-4840.744**	-0.192	-0.978*	1.117*
	-2044.36	-0.225	-0.295	-0.325
	[-2.367]	[-0.853]	[-3.311]	[3.438]
D(FDIINFL(-1))	-0.400	-4.055	7.145	-6.075
	-0.322	-3.505	-4.705	-5.105
	[-1.242]	[-1.141]	[1.533]	[-1.184]
D(FDIINFL(-2))	0.215	-2.335	7.535	-6.395
	-0.386	-4.305	-5.605	-6.105
	[0.557]	[-0.547]	[1.347]	[-1.038]
D(GNPDIFL(-1))	1054.654	-0.217	-1.554*	1.822*
	-3817.47	-0.420	-0.551	-0.607
	[0.276]	[-0.518]	[-2.817]	[3.002]
D(GNPDIFL(-2))	-8670.491***	0.173	-0.825	1.048
	-4462.6	-0.491	-0.645	-0.709
	[-1.942]	[0.352]	[-1.279]	[1.478]
D(UNOKUN(-1))	-176.974	-0.798	2.355	-2.295
	-20011.4	-2.205	-2.892	-3.182
	[-0.008]	[-0.362]	[0.814]	[-0.721]
D(UNOKUN(-2))	11390.65	0.772	-7.467*	8.255*
	-18245.6	-2.010	-2.637	-2.901
	[0.624]	[0.384]	[-2.831]	[2.845]
D(GOG(-1))	-18598.46	-0.924	7.131*	-7.776*
	-17478.9	-1.926	-2.526	-2.779
	[-1.064]	[-0.479]	[2.822]	[-2.798]

D(GOG(-2))	-4089.449***	-0.108	0.200	-0.155
	-2149.19	-0.236	-0.310	-0.341
	[-1.902]	[-0.459]	[0.643]	[-0.455]
Constant	574.007	0.074	0.152**	-0.184**
	-487.626	-0.053	-0.070	-0.077
	[1.177]	[1.387]	[2.168]	[-2.379]

Standard errors in ( ) & t-statistics in [ ]. * significant at 1%, ** significant at 5%, *** significant at 10%

5.1.6 ECM Statistically viability

The viability of the ECM is measured by the help of R-square and Durbin Watson (DW). R-square values explain the impact of independent variable on dependent variable about the regression model. 1-R^2 value is aware of the outside impact on model. Durbin Watson(DW) test statistics tests the Null hypothesis that the residuals from an Ordinary least squares regression are not auto-correlated against the alternative that the ARI process. If the observed value of the DW test statistics is less than the tabulated lower bound, than one should not accepted the null hypothesis of non –autocorrelated error and vice versa. If the test statistic value lies between dL and dU the test is inconclusive. In this context, you might err on the side of conservatism and not reject the null hypothesis.

In table 4.6, targeted model equation 1 shows the value of R-square and DW statistics. R-square value is 0.8923 meaning that the independent variables can explain the dependent variable 89% from this model. The value of DW test statistics is 2.6597, lies between dL and dU. It means we cannot reject null hypothesis. Hence autocorrelation do not exist.

Table 5.1.6:ECM Statistically Viability

Targeted Model Equation 1: D(FDIINFL) = C(1)*(FDIINFL(-1) - 51905.935*GOG(-1)- 871.856) + C(2)*(GNPDIFL(-1) - 42.910*GOG(-1) - 1.17792978673) + C(3)*(UNOKUN(-1) + 0.526*GOG(-1) - 0.0304) + C(4)*D(FDIINFL(-1)) +
C(5)*D(FDIINFL(-2)) + C(6)*D(GNPDIFL(-1)) + C(7)*D(GNPDIFL(-2)) + C(8) *D(UNOKUN(-1)) + C(9)*D(UNOKUN(-2)) + C(10)*D(GOG(-1)) +C(11)*D(GOG(-2)) + C(12)

R-square	0.892	Mean dependent var	97.204
Adjusted R-square	0.723	S.D. dependent var	232.037
S.E. of regression	122.061	Sum squared resid	104292.5
Durbin-Watson stat	2.659		

Targeted Model Equation 2:D(GNPDIFL) = C(13)*(FDIINFL(-1) - 51905.935*GOG(-1) - 871.856) + C(14)*(GNPDIFL(-1) - 42.910 *GOG(-1) - 1.177) + C(15)*(UNOKUN(-1) +
0.526*GOG(-1) - 0.030) + C(16) *D(FDIINFL(-1)) + C(17)*D(FDIINFL(-2)) + C(18)*D(GNPDIFL(-1)) + C(19)*D(GNPDIFL(-2)) + C(20)*D(UNOKUN(-1)) + C(21)*D(UNOKUN(-2)) + C(22)*D(GOG(-1)) + C(23)*D(GOG(-2)) + C(24)

R-square	0.933	Mean dependent var	0.062
Adjusted R-square	0.828	S.D. dependent var	0.032
S.E. of regression	0.013	Sum squared resid	0.001
Durbin-Watson stat	1.585		

Targeted Model Equation 3:D(UNOKUN) = C(25)*(FDIINFL(-1) - 51905.935*GOG(-1) - 871.856) + C(26)*(GNPDIFL(-1) - 42.910*GOG(-1) - 1.177) + C(27)*(UNOKUN(-1) +
0.526*GOG(-1) - 0.030) + C(28) *D(FDIINFL(-1)) + C(29)*D(FDIINFL(-2)) + C(30)*D(GNPDIFL(-1)) + C(31)*D(GNPDIFL(-2)) + C(32)*D(UNOKUN(-1)) + C(33)*D(UNOKUN(-2)) + C(34)*D(GOG(-1)) + C(35)*D(GOG(-2)) + C(36)

R-square	0.896	Mean dependent var	-0.000
Adjusted R-square	0.735	S.D. dependent var	0.034
S.E. of regression	0.017	Sum squared resid	0.002
Durbin-Watson stat	2.480		

Targeted Model Equation 4: D(GOG) = C(37)*(FDIINFL(-1) - 51905.935*GOG(-1) - 871.856) + C(38)*(GNPDIFL(-1) - 42.910 *GOG(-1) - 1.17792978673) + C(39)*(UNOKUN(-1) +
0.526*GOG(-1) - 0.0304) + C(40) *D(FDIINFL(-1)) + C(41)*D(FDIINFL(-2)) + C(42)*D(GNPDIFL(-1)) + C(43)*D(GNPDIFL(-2)) + C(44)*D(UNOKUN(-1)) + C(45)*D(UNOKUN(-2)) + C(46)*D(GOG(-1)) + C(47)*D(GOG(-2)) + C(48)

R-square	0.854	Mean dependent var	0.004
Adjusted R-square	0.625	S.D. dependent var	0.031
S.E. of regression	0.019	Sum squared resid	0.002
Durbin-Watson stat	2.462		

[(dL=0.102, dU=3.227) on 1% level of significance]

[(dL=0.160, dU=3.335) on 1% level of significance]

In table 5.1.6, targeted model equation 2 shows the value of R-square and DW statistics. R-square value is 0.9332 which means that the independent variables can explain the dependent variable 93% from this model. The value of DW test statistics is 1.5854 which lies between dL and dU. It means we cannot reject null hypothesis, meaning that autocorrelation do not exists.

In table 5.1.6, targeted model equation 3 shows the value of R-square and DW statistics. R-square value is 0.8969 meaning that the independent variables can explain the dependent variable 90% from this model. The value of DW test statistics is 2.4807 the value lies between dL and dU. It means we cannot reject null hypothesis. Meaning that autocorrelation do not exist in variables.

In table 5.1.6, targeted model equation 4 shows the value of R-square and DW statistics.The value of DW test statistics is 2.4620 the value lies between dL and dU. It means we cannot reject null hypothesis. It means the autocorrelation do not exist. R-square value is 0.8542

meaning that the independent variables can explain the dependent variable 85% from this model. It means that there is good R-square value which is desirable.

It concludes that the ECM model is statistical viable. The size of statistical significance of the coefficient of the ECM measures the tendencies of each variable to return to equilibrium. Granger causality can still exist.

5.1.7 Granger Causality Test

The first row of below table 5.1.7 revealed that the null hypothesis, GNPDIFL does not Granger Cause (FDIINFL), is accepted, the level of significance is not desirable. GNPDIFL does not cause FDIINFL. In the second row the null hypothesis, FDIINFL does not Granger Cause GNPDIFL, cannot accept at 2.2 percent level of significance and therefore, FDIINFL Granger Cause GNPDIFL. Therefore, there is a unidirectional causal relationship between FDIINFL and GNPDIFL. In other words FDIINFL Granger causes GNPDIFL and not vice versa.

Third row shows that the null hypothesis, UNOKUN does not Granger Cause FDIINFL, is accepted, the level of significance is not desirable. UNOKUN does not cause FDIINFL. In the fourth row the null hypothesis, FDIINFL does not Granger Cause UNOKUN, can not accept at 1.3 percent level of significance and therefore, FDIINFL Granger Cause UNOKUN. Therefore, there is a unidirectional causal relationship between FDIINFL and GNPDIFL. In other words FDIINFL Granger causes UNOKUN and not vice versa.

As shows in table the null hypothesis, GOG does not Granger Cause FDIINFL, cannot rejected and vice versa for the FDIINFL does not Granger Cause GOG. So, there is not a unidirectional or bidirectional relationship.

Table 5.1.7:Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.	Relationship Uni / Bidirectional
GNPDIFL does not Granger Cause FDIINFL	21	1.302	0.299	
FDIINFL does not Granger Cause GNPDIFL		4.884	0.022	→ Unidirectional
UNOKUN does not Granger Cause FDIINFL	21	2.280	0.134	
FDIINFL does not Granger Cause UNOKUN		2.996	0.078	→ Unidirectional
GOG does not Granger Cause FDIINFL	21	2.620	0.105	
FDIINFL does not Granger Cause GOG		0.133	0.876	No relation

5.1.8 Result summery of FDI inflow, unemployment, inflation and labour market

Johnson Co-integration test confirms the long run association among FDIINFL(Inflow of Foreign Direction Investment), GNPDIFL(as indicator of Inflation), UNOKUN(Unemployment estimated by the help of Okun's law) and GOG(Gap between the growth of output and estimated growth of output which shows the disequilibrium in labour market) . Inflow of Foreign Direct Investment and inflation has positive long run relationship. Inflow of FDI and unemployment has also positive long run relationship. It means that the inflow of Foreign Direct Investment goes up then the unemployment goes down,Shu-Chen Chang, 2006 has not found any relationship between FDI inflow and unemployment. On the other hand, the problem of involuntary unemployment is also the puzzle for policy makers On the other hand, the disequilibrium between the inflow of Foreign Direct Investment and labour market has negative relationship. Inflow of Foreign Direct Investment goes up then the labour market seems to be in equilibrium.

Result of Error Correction method concludes that there is speed of adjustment which is 72 percent towards equilibrium in long run. Some variables on lag also influence to adjust inflow of Foreign Direct Investment in short run.

Granger Causality test also confirms the inflow of Foreign Direct Investment which causes the Inflation. FDI inflow has unidirectional relationship with inflation and unemployment.

5.2.0 FDI Inflow and Public expenditure

This section is primarily focused to analyse relationship between public expenditure and foreign direct investment inflow in India. Public expenditure refers to government expenditure. It is incurred on various activities for the welfare of people and also for the economic development, especially in developing countries.Development Expenditure is broadly defined to include all items of expenditure that are designed directly to promote economic development and social welfare. Non-development Expenditure includes expenditure appearing under general services except expenditure on Public Works. It includes expenditure pertaining to the general services rendered by government.Excessive government expenditure has found to exert a negative impact on the foreign investment (Bissoon Ourvashi, 2011). Jain Mamta et al. (2013) said that the foreign investors are a boon to government to revenue with regard to the generation of additional income tax. Also they pay tariff on their imports. Government expenditure requirements are greatly reduces through supplementing government's investment activities in a big way there by lessening the burden on national budget. There are number of definitions about the relationship among the variable i.e. (FDIINFL) Inflow of Foreign Direct Investment, Development Expenditure (DE) and Non-development Expenditure (NDE).Does the foreign direct investment have positive sign to improve the development of country? Has there been any requirement in long run foreign direct investment instead of non-development expenditure?

5.2.1 ADF Unit Root Test of stationarity

Table 5.2.1 shows the computed ADF test-statistics for NDE on intercept and Intercept & Trend model at 1st difference is stationary at 1% level of significance. Because the calculated values of NDE is -4.2025 and -4.7365 less than the critical (at 1% level of significance) for Intercept and Trend & Intercept respectively. Therefore, we can accept Null Hypothesis on 1% level of significance for NDE. So, NDE is stationary I(2). It means that the

unit root does not exist and series is stationary on I(2). DE on 2nd difference calculated ADF test statistics value is less than the critical value at 10 % level of significance on intercept model. Again we cannot reject Null Hypothesis on 10% level of significance.

The computed ADF test-statistics on intercept model for stationary are performed on level, 1st difference and 2nd difference (0.4802, -2.0745 and -3.5192 respectively). The value of 2nd difference is smaller than the critical vale of 'tau'. Therefore, we cannot reject Null Hypothesis on 5% level of significant for 2nd difference computed ADF test-statistics.

Table 5.2.1: Augmented Dickey-Fuller Unit Root Test

Variables	Model	Level	1st Diff	2nd Diff
FDIINFL	Intercept	0.480	-2.074	-3.519**
	Trend & Intercept	-1.283	-2.307	-3.423***
DE	Intercept	2.064	-1.228	-2.922***
	Trend & Intercept	0.241	-1.997	-2.726
NDE	Intercept	5.093	0.782	-4.202*
	Trend & Intercept	3.256	-0.909	-4.736*

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

Critical values of 'tau' are given in appendix

5.2.2 PP Unit Root Test of stationarity

Table 5.2.2, shows that the computed PP test-statistics is smaller than the critical value of 'tau' which is indicated with *(star). The computed PP test-statistics is smaller than the critical value of 'tau' (1% level of significant) DE and NDE on 2nd difference which accepted the null hypothesis. Hence, DE and NDE series are stationary. All the series are stationary on 1st and 2nd difference on 1% and 5% level of significance. The series are stationary, I(1) and I(2).

DE and NDE become stationary at 1% level of significant on 2nd difference on Intercept and Trend & Intercept models.Once variable have been classified as integrated of order I(0), I(1) and I(2) is possible to setup models that leads to stationary relation among the variables and where standard inference is possible. The necessary criteria for stationary among non-stationary variable is called co-integration.

Table 5.2.2: Phillips-Parron Unit Root Test

Variables	Model	Level	1st Diff	2nd Diff
FDIINFL	Intercept	0.239	-4.431*	-8.095*
	Trend & Intercept	-1.592	-4.708*	-7.887*
DE	Intercept	3.464	-2.497	-8.770*
	Trend & Intercept	0.355	-3.957**	-8.522*
NDE	Intercept	7.126	-0.806	-9.787*
	Trend & Intercept	2.699	-3.713**	-12.722*

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

Critical values of 'tau' are given in appendix

5.2.3 Johanson Co-integration Test

Trace statistics (47.55) is greater than critical value at 1% level of significance which rejects the null hypothesis. Its mean there are co-integrated equation. P-value also shows the significance of co-integrated equations. Trace Statistic indicates 1 co-integrated equation at 99% level of confidence. It means that there is error term or all the variables are cointigrated and variables have long run association.

Maximum eigenvalue test under the Johanson Co-integration test in table 7.3 shows the 1 cointegrating equations at 1% level of significance and shows 99% level of confidence. On the None hypothesis means there is no co-integrated equation or error term. The max-Eigen statistics value (40.07) is greater than the critical value at 1% level of significance. P value shows the higher confidence level. It means that the null hypothesis cannot accept. Max-Eigen statistics indicates 1 significant cointegrating equations.

Johanson Co-integration test of Trace and Max confirms the long run association among FDIINFL, DE and NDE. As discussed in the chapter of methodology it is necessary to check the VECM model to correct or speed of adjustment.

Table 5.2.3: Johanson Co-integration Test

Unrestricted Co-integration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.865	47.558	29.797	0.000
At most 1	0.191	7.482	15.494	0.522
At most 2	0.149	3.228	3.841	0.072

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 Co-integration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.865	40.075	21.131	0.000
At most 1	0.191	4.254	14.264	0.831
At most 2	0.149	3.228	3.841	0.072

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

5.2.4 Normalized Co-integration Equation

Table 5.2.4 the estimates of the normalized cointegrating shows the long run associations or relationship among the FDIINFL, DE and NDE. The positive sign among indicates the same direction movements of variables in long run. While coefficient of DE has significant positive sign meaning that DE has positive relationship in long run with FDIINFL. The coefficient of NDE has significant negative value.

Co-integrationequation ,

FDIINFL = 0.28(DE) – 0.126(NDE) ….5.2

Table 5.2.4: Normalized Co-integration Equation

Normalized cointegrating coefficients (standard error in parentheses)			
FDIINFL		DE	NDE
1.000	=	0.285	-0.126
		(-0.021)	(-0.015)

5.2.5 Vector Error Correction Model

Having discussed in methodology of VECM, the results revealed that the targeted model D(FDIINFL) has shown the error correction coefficient (-0.7507) for co-integration equations. All the dependent variables are converted in 1st difference during the estimation.

There are requirement to check the significance of independent variables on lag one and two to explain the dependent variable in long run D(FDIINFL), D(DE) and D(NDE) are dependent variables. D(FDIINFL(-1)), D(FDIINFL(-2)), D(DE(-1)), ,D(DE(-2)) and D(NDE(-1)), D(NDE(-2)) are independent variables on lag one.

As per ECM, the coefficient of ECMshould be significant and has negative Speed. Speed of adjustment towards equilibrium is 75.07%. Speed of adjustment in any disequilibrium towards long run equilibrium state 75.07% meaning that it is adjusting very fast toward long run equilibrium. The coefficient value of cointegrating equation is also significant for the long run adjustment towards equilibrium. Short run coefficient is also significant as shows in table 5.2.5 with the superscript * on 1%, 5% and 10% level of significance respectively.

Table 5.2.5: Vector Error Correction Estimates

Error Correction:	D(FDIINFL)	D(DE)	D(NDE)
CointEq1	-0.750	2.9241*	-1.480*
	-1.370	-0.577	-0.541
	[-0.547]	[5.064]	[-2.732]
CointEq2	0.411	-0.760*	0.520*
	-0.453	-0.191	-0.179
	[0.906]	[-3.977]	[2.902]
D(FDIINFL(-1))	0.505	-2.372*	1.985*
	-1.260	-0.530	-0.498
	[0.400]	[-4.468]	[3.983]
D(FDIINFL(-2))	0.977	-0.105	0.457
	-1.249	-0.526	-0.493
	[0.782]	[-0.200]	[0.926]
D(DE(-1))	-0.174	-0.794*	0.433**
	-0.435	-0.183	-0.172
	[-0.399]	[-4.327]	[2.514]

D(DE(-2))	-0.493	-0.643*	0.436**
	-0.528	-0.222	-0.208
	[-0.934]	[-2.893]	[2.092]
D(NDE(-1))	0.086	-0.265	-0.0242
	-0.720	-0.303	-0.284
	[0.120]	[-0.874]	[-0.085]
D(NDE(-2))	0.303	-0.543***	0.500***
	-0.683	-0.287	-0.270
	[0.444]	[-1.889]	[1.853]
C	65.364	1291.04*	-306.681
	-583.584	-245.748	-230.669
	[0.112]	[5.253]	[-1.329]

Standard errors in ( ) & t-statistics in [ ]
*significant at 1%,**significant at 5%,***significant at 10%

5.2.6 ECM Statistically viability

In table 5.2.6, targeted model equation 1 shows the value of R-square and DW statistics. R-square value is 0.56 meaning that the independent variables can explain the dependent variable 56% from this model. It means that there is good R-square value which is desirable. The value of DW test statistics is 1.44, which lies between dL and dU.

Targeted model equation 2 shows the value of R-square and DW statistics. R-square value is 0.97 meaning that the independent variables can explain the dependent variable 97% from this model.

In table 5.2.6, targeted model equation 3 also shows the value of R-square and DW statistics. R-square value is 0.95 meaning that the independent variables can explain the dependent variable 95% from this model. It means that there is good R-square value which is desirable. The value of DW test statistics is 1.68, which is between the dL and dU.

It means we accept the null hypothesis in all the three targeted equations. It means that the variables are not autocorrelated.

Table 5.2.6: ECM Statistically Viability

Targeted Model Equation1: D(FDIINFL) = C(1)*(FDIINFL(-1) + 0.090*NDE(-1) - 823.954) + C(2)*(DE(-1) - 0.124*NDE(-1) - 2104.636) + C(3)*D(FDIINFL(-1)) + C(4)*D(FDIINFL(-2)) + C(5) *D(DE(-1)) + C(6)*D(DE(-2)) + C(7)*D(NDE(-1)) + C(8)*D(NDE(-2)) + C(9)

R-square	0.563	Mean dependent var	92.781
Adjusted R-square	0.245	S.D. dependent var	226.713
S.E. of regression	196.902	Sum squared resid	426476.400
Durbin-Watson stat	1.442		

Targeted Model Equation2:D(DE) = C(10)*(FDIINFL(-1) + 0.090*NDE(-1) - 823.954) + C(11)*(DE(-1) - 0.124*NDE(-1) - 2104.636) + C(12)*D(FDIINFL(-1)) + C(13)*D(FDIINFL(-2)) + C(14)*D(DE(-1)) + C(15)*D(DE(-2)) + C(16)*D(NDE(-1)) + C(17) *D(NDE(-2)) + C(18)

R-square	0.977	Mean dependent var	355.616
Adjusted R-square	0.960	S.D. dependent var	418.137
S.E. of regression	82.915	Sum squared resid	75625.470
Durbin-Watson stat	2.016		

Targeted Model Equation3:D(NDE) = C(19)*(FDIINFL(-1) + 0.090*NDE(-1) - 823.954) + C(20)*(DE(-1) - 0.124*NDE(-1) - 2104.636) + C(21)*D(FDIINFL(-1)) + C(22)*D(FDIINFL(-2)) + C(23)*D(DE(-1)) + C(24)*D(DE(-2)) + C(25)*D(NDE(-1)) + C(26) *D(NDE(-2)) + C(27)

R-square	0.955	Mean dependent var	338.965
Adjusted R-square	0.923	S.D. dependent var	282.027
S.E. of regression	77.828	Sum squared resid	66629.620
Durbin-Watson stat	1.689		

[(dL=0.102, dU=3.227) on 1% level of significance]

[(dL=0.160, dU=3.335) on 1% level of significance]

5.2.7 Granger Causality Test

Having discussed about the granger causality test in the chapter of methodology, the first row of table 5.2.7 revealed that the null hypothesis, DE does not Granger Cause FDIINFL, cannot be accepted, at 8 percent level of significance. It means DE cause to FDIINFL. In the second

row the null hypothesis, FDIINFL does not Granger Cause DE, is accepted and therefore, FDIINFL does not cause DE.

The third row of table 5.2.7 revealed that the null hypothesis, NDE does not Granger Cause FDIINFL, is accepted, the level of significance does not desirable. NDE does not cause FDIINFL. In the fourth row the null hypothesis, FDIINFL does not Granger Cause NDE, cannot accept at the desirable level of significance and therefore, FDIINFL cause to NDE. Hence, there is a unidirectional causal relationship between FDIINFL and NDE.

In table 5.2.7.in fifth row is also confirming the cause relationship between NDE and DE to reject the null hypothesis and sixth row shows the acceptance of null hypothesis. Hence, NDE and DE has unidirectional relationship.

Table 5.2.7:Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.	Relationship Uni / Bidirectional
DE does not Granger Cause FDIINFL	21	2.956	0.080	→ Unidirectional
FDIINFL does not Granger Cause DE		28.704	5.000	
NDE does not Granger Cause FDIINFL	21	2.153	0.148	
FDIINFL does not Granger Cause NDE		4.022	0.038	→ Unidirectional
NDE does not Granger Cause DE	21	17.001	0.000	→ Unidirectional
DE does not Granger Cause NDE		1.492	0.254	

5.2.9 Result summery of FDI inflow, development expenditure and non-development expenditure

The empirical results revealed that the (FDIINFL) inflow of foreign direct investment, (DE) development expenditure and (NDE) non-development expenditure are related with the development of economy.

Johanson co-integration test of trace and max confirms the one co-integration equation and long run association among inflow of foreign direct investment, development expenditure and non-development expenditure. Development expenditure has significant positive association with inflow of foreign direct investment. Inflow of foreign direct investment has been complementing the development expenditure. One unit increase in development expenditure can increase the FDI inflow but not in the same proportionate. Dependency of development is going on foreign direct investment as complementary. Non-development expenditure has significant negative association with inflow of foreign direct investment. One unit decrease in Non-development expenditure can reduce the FDI inflow in less proportionate.

Speed of adjustment is 75 percent towards in long run equilibrium in long run. Again some coefficient is significant to adjust the speed with foreign direct investment. ECM statistical viability also shows the significance of R-square and DW statistics.

Granger Causality tests also confirms the unidirectional relationship between development expenditure and inflow of foreign direct investment. Foreign direct investment and non-development expenditure, non-development expenditure and development expenditure has unidirectional relationship. All the three variables are highly correlated.

5.3.0 FDI Inflow, Capital Formation and Domestic Saving.

This section is primarily focused on the relationship of Foreign Direct Investment, capital formation and domestic saving. There are number of definitions about the relationship among the variable i.e. (FDIINFL) Inflow of Foreign Direct Investment, Capital Formation (GDCF) and Gross Domestic Saving (GDS).Chung chen, et al.1995, used the domestic saving variable with FDI and found that the effect of FDI on domestic saving was not statistically significant and may have a negative effect on domestic saving. The volume and composition of domestic savings in India have undergone significant changes over the years. Savings come from three sources, viz. households, the private corporate sector, and the public sector. Capital is the produced means of production or it is called produced wealth by which more wealth is possible in the economy directly and indirectly. FDI seems to have a positive impact on capital accumulation (Mello Luiz R. de, 1999). Capital formation means creation of physical assets and non- physical capital consisting of public health efficiency, visible and no visible capital. How the FDI inflow cause to Domestic Saving and Capital Formation?

5.3.1 ADF Unit Root Test of stationarity

Table 5.3.1 shows the results of ADF test-statistics on level , 1st difference and 2nd difference for Intercept and Trend & Intercept model.

ADF test-statistics is significance at 1% level of significant for the series GFCF and GDS, thus it means the series does not has an unit root problem and GFCF and GDS are a stationary at 11% significant level. That's mean the 2nd difference of series become stationary. Therefore all the series are stationary integrated order of two, I(2) for ADF test-statistics in Table 5.3.1.

Table 5.3.1: Augmented Dickey-Fuller Unit Root Test

Variables	Model	Level	1st Diff	2nd Diff
FDIINFL	Intercept	0.480	-2.074	-3.519**
	Trend & Intercept	-1.283	-2.307	-3.423***
GFCF	Intercept	1.870	-2.474	-6.584*
	Trend & Intercept	0.617	-3.897**	-6.571*
GDS	Intercept	1.533	-3.338**	-8.103*
	Trend & Intercept	-1.227	-5.025*	-7.836*

5.3.2 PP Unit Root Test of stationarity

As the ADF Unit Root Test –statistics helps to check the stationarity and non stationarity of time series data. Phillips Parron test-statistics is also useful to check the stationarity and non stationarity without augmented term in the model of Intercept and Trend & Intercept. If the value of Phillips Parron is smaller than the critical value of 'tau', it means the time series does not has an unit root problem. It may be on 1%, 5% or 10% significant level.

Table 5.3.2 shows that the computed PP test-statistics is smaller than the critical vale of 'tau' which is indicated with *(star). It means the time series does not havea unit root problem may be on 1%, 5% or 10% significant level. The computed PP test-statistics is smaller than the critical vale of 'tau' for GFCF and GDS on level. GFCF and GDS series are stationary to accept the Null Hypothesis. If the time series is stationary on level, I(1) than it will be stationary on 1st difference and 2nd difference.

GFCF and GDS become stationary at 1% level of significant on 1st difference at Intercept and Trend & Intercept.As the ADF test-statistics and PP test-statistics table 5.4.1 and 5.3.2 shows that all the series become stationary on I(2).

Once variable have been classified as integrated of order I(0), I(1) and I(2) is possible to setup models that lead to stationary relation among the variables and where standard inference is possible. The necessary criteria for stationary among non-stationary variable is called co-integration.

Table 5.3.2: Phillips-Parron Unit Root Test

Variables	Model	Level	1st Diff	2nd Diff
FDIINFL	Intercept	0.239	-4.431*	-8.095*
	Trend & Intercept	-1.592	-4.708*	-7.887*
GNPDIFL	Intercept	2.517	-4.002*	-14.501*
	Trend & Intercept	-1.119	-5.261*	-15.400*
UNOKUN	Intercept	2.111	-4.596*	-10.574*
	Trend & Intercept	-1.726	-7.179*	-10.610*

5.3.3 Johanson Co-integration Test

Trace statistics (50.16) is greater than critical value at 1% level of significance which rejects the null hypothesis. Its mean there are co-integrated equation. P-value also shows the significance of co-integrated equations. It means that the null hypothesis cannot accept again to confirm the co-integrated equations. Trace Statistic indicates one co-integrated equation at 99% level of confidence. It means that there is error term or all the variables are cointigrated and variables have long run association.

Maximum eigenvalue test under the Johanson Co-integration test in table 5.4.3. shown the one cointegrating equations at 1% level of significance and shows 99% level of confidence. On the None hypothesis mean there is no co-integrated equation or error term. The max-Eigen statistics value (38.49) is greater than the critical value at 1% level of significance. P value is shown the higher confidence level. It means that the null hypothesis is concluded to reject. Max-Eigen statistics indicates 1 significant cointegrating equations.

Johanson Co-integration test of Trace and Max confirms the long run association among FDIINFL, GFCF and GDS. Now it is necessary to check the VECM model to check the error correction model.

Table 5.3.3: Johanson Co-integration Test

Unrestricted Co-integration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.854	50.160	29.797	0.000
At most 1	0.395	11.660	15.494	0.173
At most 2	0.076	1.584	3.841	0.208

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 Co-integration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.854	38.499	21.131	0.000
At most 1	0.395	10.076	14.264	0.207
At most 2	0.076	1.584	3.841	0.208

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

5.3.4 Normalized Co-integration Equation

Moreover, according table 5.3.4.to the estimates of the normalized cointegrating has shown the long run associations or relationship among the FDIINFL,GFCF and GDS. Positive signmeans the variables move together in same direction in long run. Coefficient of GFCF has significant positive sign meaning that GFCF and FDIINFL have positive association in long run. On the other hand GDS and FDIINFL have significant negative association in long run.

Co-integrationequation ,

FDIINFL = 0.32(GFCF) – 0.20(GDS) ….5.3

Table 5.3.4: Normalized Co-integration Equation

Normalized cointegrating coefficients (standard error in parentheses)			
FDIINFL		GFCF	GDS
1.000	=	0.326	-0.205
		(-0.045)	(-0.049)

5.3.5 Vector Error Correction Model

The results revealed that the targeted model D(FDIINFL) has shown the error correction coefficient (-0.3371) for co-integration equations. All the dependent variables are converted in 1st difference by system during the estimation. There are requirements to check the significance of independent variables on lag one and lag two to explain the dependent variable. D(FDIINFL), D(GFCF) D(GDS) are dependent variables. D(FDIINFL(-1)), D(FDIINFL(-2)), D(GFCF(-1)), D(GFCF(-2)),D(GDS(-1)), D(GDS(-2)) and D(GDS(-1))are independent variables.

The error correction coefficient should be significant and negative Speed. Speed of adjustment towards equilibrium is 33%. Speed of adjustment in any disequilibrium towards

long run equilibrium state 33% meaning that it is adjusting very fast toward long run equilibrium. The coefficient value of cointegrating equation is also significant for the long run adjustment towards equilibrium. Short run coefficients are also significant at 1 percent level of significance as shows in table 5.3.5.

Table 5.3.5: Vector Error Correction Estimates

Error Correction:	D(FDIINFL)	D(GFCF)	D(GDS)
CointEq1	-0.337**	7.489*	6.344*
	-0.165	-0.886	-1.055
	[-2.032]	[8.449]	[6.008]
D(FDIINFL(-1))	0.177	-0.739	0.279
	-0.146	-0.780	-0.929
	[1.216]	[-0.947]	[0.300]
D(FDIINFL(-2))	-0.065	-8.023*	-7.521*
	-0.196	-1.050	-1.251
	[-0.330]	[-7.636]	[-6.009]
D(GFCF(-1))	-0.130	2.907*	2.621*
	-0.086	-0.463	-0.551
	[-1.506]	[6.274]	[4.749]
D(GFCF(-2))	0.191	2.666*	2.393*
	-0.078	-0.421	-0.502
	[2.431]	[6.320]	[4.762]
D(GDS(-1))	0.183	-2.731*	-2.651*
	-0.088	-0.473	-0.563
	[2.075]	[-5.769]	[-4.701]
D(GDS(-2))	-0.028	-2.438*	-2.362*
	-0.082	-0.441	-0.525
	[-0.340]	[-5.525]	[-4.494]
C	-57.20***	1051.118*	1157.097*
	-29.741	-158.931	-189.313
	[-1.923]	[6.613]	[6.112]

Standard errors in ( ) & t-statistics in [ ]

5.3.6 ECM Statistically viability

In table 5.3.6, targeted model equation 1 shows the value of R-square and DW statistics. R-square value is 0.90 meaning that the independent variables can explain the dependent variable 90% from this model. The value of DW test statistics is 1.98, lies between dL and dU. It means we cannot reject null hypothesis. It means that the variables are not autocorrelated.

Table 5.3.6: ECM Statistically Viability

Targeted Model Equation 1: D(FDIINFL) = C(1)*(FDIINFL(-1) - 0.559*GFCF(-1) + 0.495*GDS(-1) + 261.234) + C(2)*D(FDIINFL(-1)) + C(3)*D(FDIINFL(-2)) + C(4)*D(GFCF(-1)) + C(5)*D(GFCF(-2)) + C(6) *D(GDS(-1)) + C(7)*D(GDS(-2)) + C(8)			
R-square	0.907	Mean dependent var	114.588
Adjusted R-square	0.848	S.D. dependent var	210.273
S.E. of regression	81.766	Sum squared resid	73543.02
Durbin-Watson stat	1.985		
Targeted Model Equation 2:D(GFCF) = C(9)*(FDIINFL(-1) - 0.559*GFCF(-1) + 0.495*GDS(-1) + 261.234) + C(10)*D(FDIINFL(-1)) + C(11)*D(FDIINFL(-2)) + C(12)*D(GFCF(-1)) + C(13)*D(GFCF(-2)) + C(14)*D(GDS(-1)) + C(15)*D(GDS(-2)) + C(16)			
R-square	0.901	Mean dependent var	933.752
Adjusted R-square	0.839	S.D. dependent var	1089.626
S.E. of regression	436.936	Sum squared resid	2100047.00
Durbin-Watson stat	2.165		
Targeted Model Equation 3: D(GDS) = C(17)*(FDIINFL(-1) - 0.559*GFCF(-1) + 0.495*GDS(-1) + 261.234) + C(18)*D(FDIINFL(-1)) + C(19)*D(FDIINFL(-2)) + C(20)*D(GFCF(-1)) + C(21)*D(GFCF(-2)) + C(22)*D(GDS(-1)) + C(23)*D(GDS(-2)) + C(24)			
R-square	0.852	Mean dependent var	813.973
Adjusted R-square	0.759	S.D. dependent var	1060.955
S.E. of regression	520.461	Sum squared resid	2979687.00
Durbin-Watson stat	2.075		

In table 5.3.6, targeted model equation 2 shows the value of R-square and DW statistics. R-square value is 0.907 meaning that the independent variables can explain the dependent variable 90% from this model. The value of DW test statistics is 2.16 which lies between dL and dU. It means we cannot reject null hypothesis.

Targeted model equation 3in table 5.3.6 shows the value of R-square and DW statistics. R-square value is 0.852 meaning that the independent variables can explain the dependent variable 85% from this model. The exogenous factor is also affecting the dependent variable which is 15%. The value of DW test statistics is 2.07 the value lies between dL and dU. It means we can accept null hypothesis.

5.3.7 Granger Causality Test

The first row of below table 5.3.7 revealed that the null hypothesis, GFCF does not Granger Cause (FDIINFL), cannot accept the null hypothesis, the level of significance is desirable. GFCF cause FDIINFL. In the second row the null hypothesis, FDIINFL does not Granger Cause GFCF, is accepted at 59% percent level of significance and therefore, FDIINFL does not Granger Cause GFCF. So, there is a unidirectional causal relationship between GFCF and FDIINFL. In other words FDIINFL does not Granger causes GFCF and not vice versa.

Third row shows that the null hypothesis, GDS does not Granger Cause FDIINFL, can not accept, the level of significance is desirable. GDS cause FDIINFL. In the fourth row the null hypothesis, FDIINFL does not Granger Cause UNOKUN, is accepted at 38% percent level of significance and therefore, FDIINFL Granger Cause UNOKUN. So, there is a unidirectional causal relationship between GDS and FDIINFL. In other words GDS Granger causes FDIINFL and not vice versa.

GDS and GFCF are not causing to each other in fifth and sixth row. So, there is not a unidirectional or bidirectional relationship.

Table 5.3.7:Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.	Relationship Uni / Bidirectional
GFCF does not Granger Cause FDIINFL	20	15.508	0.000	→ Unidirectional
FDIINFL does not Granger Cause GFCF		0.540	0.593	
GDS does not Granger Cause FDIINFL	20	8.823	0.003	→ Unidirectional
FDIINFL does not Granger Cause GDS		1.016	0.386	
GDS does not Granger Cause GFCF	20	1.883	0.186	No relation
GFCF does not Granger Cause GDS		1.394	0.278	

5.3.8 Result summery of FDI inflow, gross fixed capital formation and gross domestic saving

The objective of this research work is to identify possible long-run relationship and direction of causalities among FDIINFL, GFCF and GDS in India. The study has used inferential analysis based on Co-integration analysis and Error Correction Method to evaluate the relationship among variables in multidimensional space while considering all the possible dynamic interactions between them.

Johnson Co-integration test confirms the long run association among FDIINFL (Inflow of Foreign Direction Investment), GFCF(Gross Fixed Capital Formation) and GDS(Gross Domestic Saving) . Inflow of Foreign Direct Investment and Gross Fixed Capital Formation has positive long run relationship. FDI seems to have a positive impact on capital accumulation (Mello Luiz R. de, 1999) which supports the findings. If Gross Fixed Capital Formation goes up then the inflow of Foreign Direct Investment also goes up. Creation of

physical assets and non- physical capital consisting of public health efficiency, visible and no visible capital goes up with the inflow of foreign direct investment.

The result with the gross domestic saving and inflow of Foreign Direct Investment has negative relation in long run.Chung chen, et al.1995, said that the effect of FDI on domestic saving was not statistically significant and may have a negative effect on domestic saving. Result of Error Correction method concludes that there is speed of adjustment which is 33 percent towards equilibrium in long run. Some variables on lag also influence to adjust inflow of Foreign Direct Investment in short run.

Granger Causality test also confirms the gross fixed capital formation and inflow of Foreign Direct Investment has unidirectional relationship. Gross domestic saving and Inflow of Foreign Direct Investment has also unidirectional relationship.

Chapter: 6
Causal relationship between FDI & exogenous macroeconomic variables

6.1 Introduction

This chapter focused to measure causal relationship of exogenous macroeconomic variables with FDI inflow in India. Exogenous macroeconomic variables and their relationship with inflow of FDI used in the present study has discussed in the part of methodology. In the present study following variables has been used in time series with the addition of some more exogenous variables which has been not used earlier in Indian context i.e.,Foreign reserve, annual exchange rate and sources of foreign capital inflow are the components of capital account also used to check the causal relationship between inflows of FDI as exogenous macroeconomic variables. Component of capital account i.e., net external assistance, net commercial borrowing, rupee debt service and net NRI deposit which are also influenced on inflow of FDI. The objectives of this chapter mentioned in introduction are: to estimate the short run and long run relationship between FDI inflow and exogenous macroeconomic variables in India; and to analyse the causal relationship between FDI inflow and exogenous macroeconomic variables. Null hypothesis of this chapter are: FDI inflow does not cause exchange rate, foreign reserve and trade; FDI inflow does not cause the parameters of capital account.

To achieve above mentioned objectives, econometrics methods has been used which has been discussed in the part of methodology.

6.1.0 FDI Inflow, Foreign Reserve, Exchange Rate and Trade

Relationship of exogenous macro variables with FDIINFL is focused in this chapter with the help of different econometrics tools. There are number of definitions about the

relationship among the variable i.e.(FDIINFL) Inflow of Foreign Direct Investment, Foreign Reserve (FR), Average Exchange Rate(AER) and Openness in a economy for trade(OPEN). This chapter investigates the relationship among these variable in Indian context.Real exchange rate recorded negative association with inflow of FDI (Goldberg and Klein, 1998).Foreign Reserve are now generally maintained by countries for meeting their international payment obligations in short and long terms, including sovereign and commercial debts, financing of imports, for intervention in the foreign currency markets during periods of volatility, besides helping to boost the confidence of the market in the ability of a country. Calvo Guillermo A. et al.1996, found that the substantial portion of the surge in capital inflows has channeled to accumulation of foreign exchange reserve. Reserve accumulation can be an instrument to interfere with the exchange rate. A currency will tend to become more valuable whenever demand for it is greater than the available supply. Openness is also necessary part to investigate the relationship with Foreign Direct Investment. Muhammad Shahzad Iqbal, et al. 2010 found bidirectional relationship between FDI inflow and import and export.So, openness to trade for economic prosperity is necessity part. Does the Foreign Direct Investment cause to increase the foreign reserve, and to control the exchange rate?

6.1.1 ADF Unit Root Test of stationarity

Table 6.2.1 shows the results AER and OPEN series are stationary on intercept and Trend & Intercept respectively at 5% level of significance on 1st difference.

Again the computed ADF test-statistics is significance at 1% level of significant for the series AER and OPEN, thus it means the series does not havean unit root problem and AER and OPEN are a stationary at 1% significant level on 2nd difference. That means the 2nd difference of series become stationary. Therefore all the series are stationary integrated order of two, I(2) for ADF test-statistics in Table 6.1.1.

Table 6.1.1: Augmented Dickey-Fuller Unit Root Test

Variables	Model	Level	1st Diff	2nd Diff
FR	Intercept	0.790	-3.138**	-6.850*
	Trend & Intercept	-1.641	-4.771*	-6.655*
AER	Intercept	-1.582	-3.651**	-5.174*
	Trend & Intercept	-2.210	-3.107	-5.440*
OPEN	Intercept	3.332	-1.968	-7.170*
	Trend & Intercept	0.929	-4.438**	-7.298*
FDIINFL	Intercept	0.480	-2.074	-3.519**
	Trend & Intercept	-1.283	-2.307	-3.423***

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

Critical values of 'tau' are given in appendix

6.1.2 PP Unit Root Test of stationarity

Phillips Parron test-statistics is also useful to check the stationary and non-stationary without augmented term in the model of Intercept and Trend & Intercept.

The computed PP test-statistics is smaller than the critical value of 'tau' (1%, 5% and 10% level of significant) for FR, AER, OPEN and FDIINFL on 1st Difference. FR, AER, OPEN and FDIINFL series are stationary to accept the Null Hypothesis for no unit root. All the series are stationary on 2nd difference on 1% level of significance. The series are stationary, I(1) and I(2).

FDIINFL and GNPDIFL become stationary at 1% level of significant on 2nd difference and FDIINFL is already significant on 1st difference at Intercept and Trend & Intercept.

Once variable have been classified as integrated of order I(0), I(1) and I(2) etc is possible to setup models that lead to stationary relation among the variables and where standard inference is possible. The necessary criteria for stationary among non-stationary variable is called co-integration.

Table 6.1.2: Phillips-Parron Unit Root Test

Variables	Model	Level	1st Diff	2nd Diff
FR	Intercept	1.639	-2.969***	-7.344*
	Trend & Intercept	-1.362	-3.533***	-7.325*
AER	Intercept	-2.541	-3.891*	-8.032*
	Trend & Intercept	-2.804	-3.529***	-15.544*
OPEN	Intercept	9.033	-3.842*	-14.655*
	Trend & Intercept	3.136	-6.279*	-17.410*
FDIINFL	Intercept	0.239	-4.431*	-8.095*
	Trend & Intercept	-1.592	-4.708*	-7.887*

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

Critical values of 'tau' are given in appendix

6.1.3 Johanson Co-integration Test

For the **e**xistence of unit roots for all time series, we employ co-integration technique. The None indicate the Null Hypothesis for no co-integrated equation. At most 1 indicates that there is one co-integrated equation or error term. At most 2 mean that there are two co-integrated equation.

Trace statistics (141.34) is greater than critical value at 1% level of significance which rejects the null hypothesis. Its mean there are co-integrated equation. P-value also shows the significance of co-integrated equations. The value of at most 1 is also significant by the p-value and trace statistics (71.36) is greater than critical value. It means that the null hypothesis can not accept again to confirm the co-integrated equations. The values of at most 2 and 3 are also significant by the p-value and trace statistics (32.20 and 12.51 respectively) is greater than critical value. It means that the null hypothesis can not accept again to confirm the co-integrated equations.Trace Statistic indicates four co-integrated equation at 99% level of confidence. It means that there is error term or all the variables are co-integrated and variables have long run association.

Maximum eigenvalue test under the Johanson Co-integration test in table 6.2.3.shows the four cointegrating equations at 1% level of significance and shows 99% level of confidence. On the none hypothesis mean there is no co-integrated equation or error term. The max-Eigen statistics value (69.97) is greater than the critical value at 1% level of significance. P value shows the higher confidence level. It means that the null hypothesis can not accept. At most 1, 2 and 3 also shows the significant result to reject the null hypothesis at 1% significant level. Max-Eigen statistics indicates 4 significant cointegrating equations.

Johanson Co-integration test of Trace and Max confirms the long run association among FDIINFL, FR,AER and OPEN. Now it is necessary to check the VECM model.

Table 6.1.3: Johanson Conintegration Test

Unrestricted Co-integration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.969	141.343	47.856	0.000
At most 1 *	0.858	71.365	29.797	0.000
At most 2 *	0.626	32.209	15.494	0.000
At most 3 *	0.465	12.516	3.841	0.000

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 Co-integration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.969	69.978	27.584	0.000
At most 1 *	0.858	39.156	21.131	0.000
At most 2 *	0.626	19.692	14.264	0.006
At most 3 *	0.465	12.516	3.841	0.000

Max-eigenvalue 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

6.1.4 NoramalizedCo-integration Equation

Table 6.1.4 the estimates of the normalized cointegrating has shown the long run associations or relationship among the FDIINFL, FR, AER and OPEN. If sign is positive it means that variables move together in long run. Coefficient of FR and AER has significant positive sign meaning that FR and AER have positive association in long run with FDIINFL. When the FR and AER go up the FDIINFL also goes up. FDIINFL and OPEN has significantnegative association.

Co-integrationequation ,

FDIINFL = 2.77(FR) + 140.92 (AER) – 50161.08(OPEN) ….6.1

Table 6.1.4: Noramalized Co-integration Equation

Normalized cointegrating coefficients (standard error in parentheses)				
FDIINFL		FR	AER	OPEN
1.000	=	+2.772	+140.927	-50161.080
		(-0.205)	(-20.022)	(-4475.130)

6.1.5 Vector Error Correction Model

The results revealed that the targeted model D(FDIINFL) has shown the error correction coefficient (-1.8378) for co-integration equations. All the dependent variables are converted in 1st difference by system during the estimation. There are requirements to check the significance of independent variables on lag one and lag two to explain the dependent variable. D(FDIINFL), D(FR),D(AER) and D(OPEN) are dependent variables. D(FDIINFL(-1)), D(FDIINFL(-2)), D(FR(-1)), D(FR(-2)),D(AER(-1)), D(AER(-2)),D(OPEN(-1)) and D(OPEN(-2)) are independent variables on lag one and lag two respectively.

The error correction coefficient should be significant and negative Speed. Speed of adjustment towards equilibrium is 183%. Speed of adjustment in any disequilibrium towards long run equilibrium state 183% meaning that it is adjusting very fast toward long run equilibrium. The coefficient value of cointegrating equation is also significant for the long run adjustment towards equilibrium. Short run coefficient is also significant as shows in table 6.1.5 with the superscript (*).

Table 6.1.5: Vector Error Correction Estimates

Error Correction:	D(FDIINFL)	D(FR)	D(AER)	D(OPEN)
CointEq1	-1.837*	-3.924**	0.000	-0.000***
	-0.283	-1.839	-0.004	-5.900
	[-6.477]	[-2.133]	[0.125]	[-1.710]
CointEq2	0.062	1.418**	-0.008*	4.207
	-0.091	-0.595	-0.001	-1.905
	[0.682]	[2.380]	[-6.170]	[0.022]
CointEq3	-12.680	65.653	-0.663*	-0.004**
	-9.580	-62.110	-0.146	-0.001
	[-1.323]	[1.057]	[-4.518]	[-2.120]
D(FDIINFL(-1))	1.378*	4.661**	-0.005	-0.000***
	-0.350	-2.271	-0.005	-7.305
	[3.934]	[2.051]	[-1.077]	[-1.760]
D(FDIINFL(-2))	1.477*	2.690	-0.005	-4.125
	-0.398	-2.580	-0.006	-8.205
	[3.712]	[1.042]	[-0.899]	[-0.498]
D(FR(-1))	-0.273*	-0.978	0.005*	5.425**
	-0.098	-0.635	-0.001	-2.005
	[-2.786]	[-1.540]	[3.958]	[2.668]
D(FR(-2))	-0.059	-1.763**	0.008*	-2.935
	-0.132	-0.857	-0.002	-2.705
	[-0.448]	[-2.056]	[3.977]	[-1.068]
D(AER(-1))	-29.599	64.825	-0.408	-0.001
	-19.512	-126.503	-0.299	-0.004
	[-1.516]	[0.512]	[-1.364]	[-0.295]
D(AER(-2))	15.972	-20.620	0.195	9.125
	-15.139	-98.149	-0.232	-0.003
	[1.055]	[-0.210]	[0.843]	[0.029]
D(OPEN(-1))	-2095.244	19667.91	-165.989*	-0.648
	-3059.53	-19835.5	-46.906	-0.633
	[-0.684]	[0.991]	[-3.538]	[-1.022]

D(OPEN(-2))	-4230.934**	5714.055	-68.366**	-0.103
	-1752.74	-11363.3	-26.871	-0.363
	[-2.413]	[0.502]	[-2.544]	[-0.285]
C	338.782*	732.499	3.400***	0.088*
	-116.683	-756.477	-1.788	-0.024
	[2.903]	[0.968]	[1.900]	[3.666]

Standard errors in ( ) & t-statistics in [ ]. * significant at 1%, ** significant at 5%,
*** significant at 10%

6.1.6 ECM Statistically viability

In table 6.1.6, targeted model equation 1 shows the value of R-square and DW statistics. R-square value is 0.92 which means that the independent variables can explain the dependent variable 92% from this model. From the deduction of the R-square value one can explain the exogenous factor also affecting the dependent variable which is 8%. It means that there is good R-square value which is desirable. The value of DW test statistics is 3.1822, which is between dL and dU.

Targeted model equation 2 shows the value of R-square and DW statistics. R-square value is 0.79 meaning that the independent variables can explain the dependent variable 79% from this model. From the deduction of the R-square value one can explain the exogenous factor is also affecting the dependent variable which is 21%. It means that there is good R-square value which is desirable. The value of DW test statistics is 2.1257, which is also between the dL and dU.

In table 6.2.6, targeted model equation 3 also shows the value of R-square and DW statistics. R-square value is 0.87 meaning that the independent variables can explain the dependent variable 87% from this model. From the deduction of the R-square value one can explain the exogenous factor is also affecting the dependent variable which is 13%. It means that there is

good R-square value which is desirable. The value of DW test statistics is 2.2966, which is between the dL and dU.

Again targeted model equation 4 shows the value of R-square and DW statistics. R-square value is 0.96 meaning that the independent variables can explain the dependent variable 96% from this model. From the deduction of the R-square value one can explain the exogenous factor is also affecting the dependent variable which is 4%. It means that there is good R-square value which is desirable. The value of DW test statistics is 2.4490, which is also between the dL and dU.

It means we cannot reject null hypothesis. It means that the variables are not autocorrelated.

Table 6.1.6: ECM Statistically Viability

Targeted Model Equation1: D(FDIINFL) = C(1)*(FDIINFL(-1) - 2070.9815*OPEN(-1) + 266.067) + C(2)*(FR(-1) - 14463.125*OPEN(-1) + 517.611) + C(3)*(AER(-1) - 86.112*OPEN(-1) - 6.224) + C(4)*D(FDIINFL(-1)) + C(5)*D(FDIINFL(-2)) + C(6) *D(FR(-1)) + C(7)*D(FR(-2)) + C(8)*D(AER(-1)) + C(9)*D(AER(-2)) +C(10)*D(OPEN(-1)) + C(11)*D(OPEN(-2)) + C(12)

R-square	0.926	Mean dependent var	92.781
Adjusted R-square	0.824	S.D. dependent var	226.713
S.E. of regression	94.882	Sum squared resid	72021.490
Durbin-Watson stat	3.182		

Targeted Model Equation2: D(FR) = C(13)*(FDIINFL(-1) - 2070.981*OPEN(-1) + 266.067) + C(14)*(FR(-1) - 14463.125*OPEN(-1) + 517.611) + C(15)*(AER(-1) - 86.112*OPEN(-1) - 6.224) + C(16)*D(FDIINFL(-1)) + C(17)*D(FDIINFL(-2)) + C(18)*D(FR(-1)) + C(19)*D(FR(-2)) + C(20)*D(AER(-1)) + C(21)*D(AER(-2)) + C(22)*D(OPEN(-1)) + C(23)*D(OPEN(-2)) + C(24)

R-square	0.795	Mean dependent var	778.838
Adjusted R-square	0.513	S.D. dependent var	882.016
S.E. of regression	615.140	Sum squared resid	3027182.000
Durbin-Watson stat	2.125		

Targeted Model Equation3: D(AER) = C(25)*(FDIINFL(-1) - 2070.981*OPEN(-1) + 266.067) + C(26)*(FR(-1) - 14463.125*OPEN(-1) + 517.611) + C(27)*(AER(-1) - 86.112*OPEN(-1) - 6.224) + C(28)*D(FDIINFL(-1)) + C(29)*D(FDIINFL(-2)) + C(30)*D(FR(-1)) + C(31)*D(FR(-2)) + C(32)*D(AER(-1)) + C(33)*D(AER(-2)) + C(34)*D(OPEN(-1)) + C(35)*D(OPEN(-2)) + C(36)

R-square	0.877	Mean dependent var	1.188
Adjusted R-square	0.709	S.D. dependent var	2.700
S.E. of regression	1.454	Sum squared resid	16.928
Durbin-Watson stat	2.296		

Targeted Model Equation4: D(OPEN) = C(37)*(FDIINFL(-1) - 2070.981*OPEN(-1) + 266.067) + C(38)*(FR(-1) - 14463.125*OPEN(-1) + 517.611) + C(39)*(AER(-1) - 86.1127945711*OPEN(-1) - 6.22401735724) + C(40)*D(FDIINFL(-1)) + C(41)*D(FDIINFL(-2)) + C(42)*D(FR(-1)) + C(43)*D(FR(-2)) + C(44)*D(AER(-1)) + C(45)*D(AER(-2)) + C(46)*D(OPEN(-1)) + C(47)*D(OPEN(-2)) + C(48)

R-square	0.964	Mean dependent var	0.054
Adjusted R-square	0.916	S.D. dependent var	0.068
S.E. of regression	0.019	Sum squared resid	0.003
Durbin-Watson stat	2.449		

[(dL=0.102, dU=3.227) on 1% level of significance]

[(dL=0.160, dU=3.335) on 1% level of significance]

6.1.7 Granger Causality Test

The first row of below table 6.1.7 revealed that the null hypothesis, FR does not Granger Cause FDIINFL, cannot be accepted, the level of significance is desirable. FR cause FDIINFL. In the second row the null hypothesis, FDIINFL does not Granger Cause FR, can not accept at 9.8 percent level of significance and therefore, FDIINFL Granger Cause FR. So, there is a bidirectional causal relationship between FDIINFL and FR.

Third row shows that the null hypothesis, AER does not Granger Cause FDIINFL, is accepted, the level of significance is not desirable. AER does not cause FDIINFL. In the fourth row the null hypothesis, FDIINFL does not Granger Cause AER, is accepted. AER and FDIINFL does not cause to each other.

As shows in table the null hypothesis, OPEN does not Granger Cause FDIINFL, cannot be rejected and vice versa for the FDIINFL does not Granger Cause OPEN. So, there is not a unidirectional or bidirectional relationship.

Table 6.1.7: Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.	Relationship Uni / Bidirectional
FR does not Granger Cause FDIINFL	21	5.570	0.014	↔ Bidirectional
FDIINFL does not Granger Cause FR		2.691	0.098	
AER does not Granger Cause FDIINFL	21	1.441	0.265	No Relation
FDIINFL does not Granger Cause AER		1.450	0.263	
OPEN does not Granger Cause FDIINFL	21	2.280	0.134	Unidirectional at 86% level of confidence
FDIINFL does not Granger Cause OPEN		0.999	0.389	

6.1.8 Result summery of FDI inflow, foreign reserve, exchange rate and trade openness

The main theme of this is to investigate relationship among exogenous variables in long run. The exogenous variables which are used in this chapter are FDIINFL, FR, AER and

OPEN. In this chapter some econometrics tools are used to investigate the long run association and relation of FR, AER and OPEN with FDIINFL.

Time series variables are non stationary on level and become stationary on 1st difference and 2nd difference. If the variables become stationary on 2nd difference then it is necessary to check the long run relationship with the help of co-integration. Co-integration test confirms the long run association among (FDIINFL) Inflow of foreign direct investment, (FR) foreign reserve, (AER) average exchange rate and (OPEN) openness in an economy for trade. Before co-integration test, it is necessary to check the stationary of time series variables.

Inflow of the foreign direct investment has been influenced by the foreign reserve and average exchange rate in long run. Econometrics analysis shows the normalized equation which is verified the positive long run relationship between foreign direct investment and foreign reserve and average exchange rate. Rise in exchange rate induces the FDI inflow.Calvo Guillermo A. et al. 1996, found that the substantial portion of the surge in capital inflows has channeled to accumulation of foreign exchange reserve Devaluation of currency helps to increase the inflow of foreign direct investment. Opennesshas significantly negative relationship with inflow of foreign direct investment.

Speed of adjustment is 183 percent towards equilibrium in long run. The coefficient of speed is significant at 1% level which is desirable result for error correction method. Some other coefficients are also significant to adjust the speed in short run those are verified by the help of t-statistics and p value.

Granger causality results have confirmed the bidirectional relationship between inflow of foreign direct investment and foreign reserve. This is the desirable objective of this study. Average exchange rate and openness for trade has not caused the inflow of foreign direct investment. The relationship among the variable are also verified by the help of correlation

coefficient. All the variables are positively correlated with each other. Inflow of foreign direct investment and openness in trade highly correlated. Inflow of foreign direct investment and foreign reserve is also highly correlated. Only average exchange rate has average positive relation with the inflow of foreign direct investment.

6.2.0 FDI Inflow and Components of Capital Account

Relationship of Capital Account's components with FDIINFL is focused in this section with the help of different econometrics tools. There are number of definitions about the relationship among the variable i.e. (FDIINFL) Inflow of Foreign Direct Investment, Net External Assistance (NEA), Net Commercial Borrowing (NCB), Rupee Debt Service (RDS) and Net NRI Deposits(NNRID). Chung Chen, et al. 1995 emphasized the importance of FDI among all sources of foreign capital inflows. Bajpai Nirupam and et al. 2000, used the variable commercial borrowing from the NRIs became disaster that was the cause when lots of short term capital had came in and lots had moved out and created a server payment crisis in 1991; that was also the reason that the doors opened to FDI. Investment promotion agencies help to terminate the external assistance by FDI inflow (Jacques Morisset, 2003). The nature and magnitude of assistance in the form of loans, grants and commodities received from friendly foreign countries and International Organizations. Net External Assistance is the difference between the outward assistance and inward assistance from outside countries. External Assistance has played a significant role in the development process in India. External Commercial Borrowing has become a major source of financing growth in India. It is competing with FDI as a source of capital flows. Capital Account and Foreign exchange reserves position are two important drivers to decide the level of commercial borrowing. Rupees debt service includes principal repayments on account of civilian and non-civilian debt in respect of rupee payment area(RPA) and interest payment thereof.NRI deposit are designated in foreign currency. The deposits can be made by Non Resident Indian. All the variables are taken as a difference of inward and outward flow of capital. Those are the part of Capital Account. How the parameters of capital account have a relationship with foreign direct investment?

6.2.1 ADF Unit Root Test of stationarity

Table 6.2.1 shows the results of the computed ADF test-statistics for NEA, NCB on intercept and Intercept & Trend model at 1st difference is stationary at 1% level of significance. Because the calculated values of NEA are -4.5707 and -4.4770 less than the critical (at 1% level of significance) for Intercept and Trend & Intercept respectively. NCB follows the result of NEA for ADF test-statistics. Therefore, we cannot reject Null Hypothesis on 1% level of significance for NEA and NCB. On 2nd difference calculated ADF test statistics value is less than the critical value at 1 % level of significance. We cannot reject Null Hypothesis on 1% level of significance also. So, NEA and NCB series is stationary or integrated order one and two, I(1) and I(2).

The computed ADF test-statistics for RDS, NNRID on intercept and Intercept & Trend model at 2nd difference is stationary at 1% level of significance.

The computed ADF test-statistics on intercept model for stationary are performed on level, 1st difference and 2nd difference (0.4802, -2.0745 and -3.5192 respectively). The value of 2nd difference is smaller than the critical vale of 'tau'. Therefore, we cannot reject Null Hypothesis on 5% level of significant for 2nd difference computed ADF test-statistics.

Therefore all the series are stationary integrated order of two, I(2) for ADF test-statistics in Table 6.2.1.

Table 6.2.1: Augmented Dickey-Fuller Unit Root Test

Variables	Model	Level	1st Diff	2nd Diff
NEA	Intercept	-2.360	-4.570*	-5.892*
	Trend & Intercept	-2.675	-4.477*	-5.730*
NCB	Intercept	-1.987	-4.448*	-5.715*
	Trend & Intercept	-3.044	-4.325*	-5.533*
RDS	Intercept	-0.255	-3.662**	-5.645*
	Trend & Intercept	-2.266	-3.944*	-5.616*
NNRID	Intercept	1.007	-2.903	-8.252*
	Trend & Intercept	-0.200	-3.505***	-8.936*
FDIINFL	Intercept	0.480	-2.074	-3.519**
	Trend & Intercept	-1.283	-2.307	-3.423***

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

Critical values of 'tau' are given in appendix

6.2.2 PP Unit Root Test of stationarity

The value of Phillips Parron is smaller than the critical value of 'tau', it means the time series does not have a unit root problem. It may be on 1%, 5% or 10% significant level.

Table 6.2.2 shows that the computed PP test-statistics is smaller than the critical vale of 'tau' which is indicated with *(star). It means the time series does not have a unit root problem may be on 1%, 5% or 10% significant level. The computed PP test-statistics is

smaller than the critical value of 'tau' (1% level of significant) for NEA, NCB, RDS and NNRID on 1st Difference which accept the null hypothesis NEA, NCB, RDS and NNRID series are stationary. We cannot reject the Null Hypothesis for no unit root on 2nd difference because all the series are again stationary on 1% level of significance. All the series are stationary on 1st and 2nd difference on 1% level of significance. The series are stationary, I(1) and I(2).

NEA, NCB, RDS and NNRID become stationary at 1% level of significant on 1st difference and on 2nd difference at Intercept and Trend & Intercept.

Once variable have been classified as integrated of order I(0), I(1) and I(2) etc is possible to setup models that leads to stationary relation among the variables and where standard inference is possible. The necessary criteria for stationary among non-stationary variable is called co-integration.

Table 6.2.2: Phillips-Parron Unit Root Test

Variables	Model	Level	1st Diff	2nd Diff
NEA	Intercept	-2.384	-6.632*	-12.099*
	Trend & Intercept	-2.469	-7.120*	-12.544*
NCB	Intercept	-2.216	-8.294*	-16.032*
	Trend & Intercept	-3.113	-8.420*	-15.613*
RDS	Intercept	-0.465	-6.530*	-21.625*
	Trend & Intercept	-3.028	-7.853*	-22.139*
NNRID	Intercept	1.248	-4.340*	-11.657*
	Trend & Intercept	-0.577	-4.842*	-14.364*
FDIINFL	Intercept	0.239	-4.431*	-8.095*
	Trend & Intercept	-1.592	-4.708*	-7.887*

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

Critical values of 'tau' are given in appendix

6.2.3 Johanson Co-integration Test

Table 6.3.1 and 6.3.2 having confirmed the existence of unit roots for all time series, we employ co-integration technique of Johansen(1988) and Johansen and Juselius(1990) to test whether there exist a long-run relationship among variables. In the case of co-integration test, the null hypothesis can be detected by Johansen's maximum likelihood method. The None indicate the Null Hypothesis for no co-integrated equation. At most 1 indicates that

there is one co-integrated equation or error term. At most 2 mean that there are two co-integrated equation.

Trace statistics (103.65) is greater than critical value at 1% level of significance which rejects the null hypothesis. Its mean there are co-integrated equation. P-value also shows the significance of co-integrated equations. The value of at most 1 is also significant by the p-value and trace statistics (51.75) is greater than critical value. It means that the null hypothesis can not accept again to confirm the co-integrated equations. The value of at most 4 is also significant by the p-value and trace statistics (3.98) is greater than critical value. It means that the null hypothesis can not accept again to confirm the co-integrated equations.Trace Statistic indicates 2 co-integratedequation at 95% level of confidence. It means that there is error term or all the variables are cointigrated and variables have long run association.

Maximum eigenvalue test under the Johanson Co-integration test in table 6.3 shows the 2 cointegrating equations at 10% level of significance and shows 90% level of confidence. On the None hypothesis mean there is no co-integrated equation or error term. The max-Eigen statistics value (51.90) is greater than the critical value at 1% level of significance. P value shows the higher confidence level. It means that the null hypothesis can not accept. At most 1 and 4 also shows the significant result to reject the null hypothesis at 10% and 5% respectively significant level. Max-Eigen statistics indicates 2 significant cointegrating equations.

Johanson Co-integration test of Trace and Max confirms the long run association among FDIINFL, NEA, NCB,RDS and NNRID. Now it is necessary to check the VECM model to correct or speed of adjustment.

Table 6.2.3: Johanson Co-integration Test

Unrestricted Co-integration Rank Test
(Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.915	103.65	69.818	0.000
At most 1 *	0.700	51.750	47.856	0.020
At most 2	0.529	26.430	29.797	0.116
At most 3	0.269	10.579	15.494	0.238
At most 4 *	0.172	3.984	3.841	0.045

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 Co-integration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.915	51.908	33.876	0.000
At most 1	0.700	25.320	27.584	0.094
At most 2	0.529	15.850	21.131	0.233
At most 3	0.269	6.594	14.264	0.538
At most 4 *	0.172	3.984	3.841	0.045

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

6.2.4 Normalized Co-integration Equation

Table 6.2.4 the estimates of the normalized cointegrating has shown the significant long run associations or relationship among the FDIINFL, NEA, NCB, RDS and NNRID. If sign is positive, meaning that variables move together in long run. Coefficient of NEA and NNRID has positive sign meaning that NEA and NNRID have positive association in long run with FDIINFL. One billion rupees rise in NEA induces the 50 billion rupees; one billion rupees rises in NNRID increase the 52.28 billion rupees FDI inflow, i.e. more than

proportionate rise in FDI in India. FDIINFL shows the negative association with NCB and RDS.

Co-integrationequation ,

FDIINFL = 50.53(NEA) – 23.37 (NCB) – 255.83(RDS) + 52.28 (NNRID) ….6.2

Table 6.2.4: Normalized Co-integration Equation

Normalized cointegrating coefficients (standard error in parentheses)				
FDIINFL	NEA	NCB	RDS	NNRID
1.0000=	50.533	-23.373	-255.831	52.280
	(-7.759)	(-3.442)	(-88.180)	(-10.550)

6.2.5 Vector Error Correction Model

The results revealed that the targeted model D(FDIINFL) has shown the error correction coefficient (-0.0666) for co-integration equations. All the dependent variables are converted in 1st difference by system during the estimation. There are requirements to check the significance of independent variables on lag one to explain the dependent variable in long run. D(FDIINFL), D(NEA),D(NCB), D(RDS) and D(NNRID) are dependent variables. D(FDIINFL(-1)), D(NEA(-1)), ,D(NCB(-1)), D(RDS(-1)) and D(NNRID(-1)) are independent variables on lag one.

The error correction coefficient is not significant and has negative Speed. Speed of adjustment towards equilibrium is 6.66%. Speed of adjustment in any disequilibrium towards long run equilibrium state 6.66% meaning that it is adjusting very fast toward long run equilibrium. The coefficient value of cointegrating equation is also significant for the long run adjustment towards equilibrium. Short run coefficient is also significant as shows in table 6.2.5 with the superscript *.

Table 6.2.5: Vector Error Correction Estimates

Error Correction:	D(FDIINFL)	D(NEA)	D(NCB)	D(RDS)	D(NNRID)
CointEq1	-0.066	0.363*	0.641	0.011	-0.168
	-0.333	-0.122	-0.454	-0.009	-0.186
	[-0.199]	[2.966]	[1.411]	[1.211]	[-0.904]
CointEq2	-1.239	-1.633*	-1.462	-0.065***	1.030
	-1.322	-0.486	-1.802	-0.038	-0.738
	[-0.937]	[-3.360]	[-0.811]	[-1.696]	[1.395]
CointEq3	0.724**	-0.167	-1.058**	-0.003	0.294
	-0.331	-0.121	-0.452	-0.009	-0.185
	[2.184]	[-1.370]	[-2.339]	[-0.375]	[1.586]
D(FDIINFL(-1))	-0.677**	0.052	0.303	0.006	-0.401**
	-0.330	-0.121	-0.450	-0.009	-0.184
	[-2.051]	[0.431]	[0.674]	[0.722]	[-2.178]
D(NEA(-1))	1.119	0.595***	1.531	0.010	-0.495
	-0.903	-0.331	-1.231	-0.026	-0.504
	[1.240]	[1.792]	[1.243]	[0.397]	[-0.982]
D(NCB(-1))	0.219	0.186***	0.516	0.009	0.045
	-0.297	-0.109	-0.405	-0.008	-0.165
	[0.738]	[1.704]	[1.275]	[1.103]	[0.274]
D(RDS(-1))	-2.988	1.419	8.317	-0.437	-12.146**
	-8.541	-3.139	-11.643	-0.250	-4.769
	[-0.349]	[0.452]	[0.714]	[-1.745]	[-2.546]
D(NNRID(-1))	1.924***	0.868**	1.192	0.0544***	-0.606
	-0.970	-0.356	-1.322	-0.028	-0.541
	[1.984]	[2.436]	[0.901]	[1.912]	[-1.119]
C	102.501***	-35.475	-64.863	-0.834	106.924*
	-60.568	-22.261	-82.570	-1.776	-33.825
	[1.692]	[-1.593]	[-0.785]	[-0.469]	[3.161]

Standard errors in ( ) & t-statistics in [ ]. * significant at 1%, ** significant at 5%,
*** significant at 10%

6.2.6 ECM Statistically viability

In table 6.2.6, targeted model equation 1 shows the value of R-square and DW statistics. R-square value is 0.59 meaning that the independent variables can explain the dependent variable 59% from this model. From the deduction of the R-square value one can explain the exogenous factor is also affecting the dependent variable which is 41%. It means that there is good R-square value which is desirable. The value of DW test statistics is 1.85, which is between dL and dU.

Targeted model equation 2 shows the value of R-square and DW statistics. R-square value is 0.52 meaning that the independent variables can explain the dependent variable 52% from this model. The exogenous factor is also affecting the dependent variable which is 48%. It means that there is good R-square value which is desirable. The value of DW test statistics is 2.20, which is also between the dL and dU.

In table 6.2.6, targeted model equation 3 also shows the value of R-square and DW statistics. R-square value is 0.43 meaning that the independent variables can explain the dependent variable 43% from this model. The exogenous factor is also affecting the dependent variable which is 57%. It means that there is good R-square value which is desirable. The value of DW test statistics is 2.20, which is between the dL and dU.

Again targeted model equation 4 shows the value of R-square and DW statistics. R-square value is 0.42 meaning that the independent variables can explain the dependent variable 42% from this model. Exogenous factor is also affecting the dependent variable which is 58%. It means that there is good R-square value which is desirable. The value of DW test statistics is 1.94, which is also between the dL and dU.

Again targeted model equation 5 shows the value of R-square and DW statistics. R-square value is 0.67 meaning that the independent variables can explain the dependent variable 67%

from this model. It means that there is good R-square value which is desirable. The value of DW test statistics is 2.20, which is also between the dL and dU. It means we cannot reject null hypothesis in all the five targeted equations. It means that the variables are not autocorrelated.

Table 6.2.6: ECM Statistically Viability

Targated Model Equation 1: D(FDIINFL) = C(1)*(FDIINFL(-1) - 10.298*RDS(-1) + 1.954*NNRID(-1) - 986.244) + C(2)*(NEA(-1) + 0.962*RDS(-1) + 1.273*NNRID(-1) - 178.630) + C(3)*(NCB(-1) + 13.467*RDS(-1) + 0.433*NNRID(-1) + 41.219) + C(4)*D(FDIINFL(-1)) + C(5)*D(NEA(-1)) + C(6)*D(NCB(-1)) + C(7)*D(RDS(-1)) + C(8) *D(NNRID(-1)) + C(9)

R-square	0.591	Mean dependent var	88.671
Adjusted R-square	0.318	S.D. dependent var	221.774
S.E. of regression	183.082	Sum squared resid	402231.300
Durbin-Watson stat	1.859		

Targated Model Equation 2: D(NEA) = C(10)*(FDIINFL(-1) - 10.298*RDS(-1) + 1.954*NNRID(-1) - 986.244) + C(11)*(NEA(-1) + 0.962*RDS(-1) + 1.273*NNRID(-1) - 178.630) + C(12)*(NCB(-1) + 13.467*RDS(-1) + 0.433*NNRID(-1) + 41.219) + C(13)*D(FDIINFL(-1)) + C(14)*D(NEA(-1)) + C(15)*D(NCB(-1)) + C(16)*D(RDS(-1)) + C(17)*D(NNRID(-1)) + C(18)

R-square	0.523	Mean dependent var	-0.235
Adjusted R-square	0.205	S.D. dependent var	75.496
S.E. of regression	67.290	Sum squared resid	54336.750
Durbin-Watson stat	2.204		

Targated Model Equation 3: D(NCB) = C(19)*(FDIINFL(-1) - 10.298*RDS(-1) + 1.954*NNRID(-1) - 986.244) + C(20)*(NEA(-1) + 0.962*RDS(-1) + 1.273*NNRID(-1) - 178.630) + C(21)*(NCB(-1) + 13.467*RDS(-1) + 0.433*NNRID(-1) + 41.219) + C(22)*D(FDIINFL(-1)) + C(23)*D(NEA(-1)) + C(24)*D(NCB(-1)) + C(25)*D(RDS(-1)) + C(26)*D(NNRID(-1)) + C(27)

R-square	0.430	Mean dependent var	20.378
Adjusted R-square	0.050	S.D. dependent var	256.122
S.E. of regression	249.588	Sum squared resid	747530.300
Durbin-Watson stat	2.194		

Targated Model Equation 4: D(RDS) = C(28)*(FDIINFL(-1) - 10.298*RDS(-1) + 1.954*NNRID(-1) - 986.244) + C(29)*(NEA(-1) + 0.962*RDS(-1) + 1.273*NNRID(-1) - 178.630) + C(30)*(NCB(-1) + 13.467*RDS(-1) + 0.433*NNRID(-1) + 41.219) + C(31)*D(FDIINFL(-1)) + C(32)*D(NEA(-1)) + C(33)*D(NCB(-1)) + C(34)*D(RDS(-1)) + C(35)*D(NNRID(-1)) + C(36)

R-square	0.428	Mean dependent var	1.183
Adjusted R-square	0.047	S.D. dependent var	5.502
S.E. of regression	5.371	Sum squared resid	346.171
Durbin-Watson stat	1.946		

Targated Model Equation 5: D(NNRID) = C(37)*(FDIINFL(-1) - 10.298*RDS(-1) + 1.954*NNRID(-1) - 986.244) + C(38)*(NEA(-1) + 0.962*RDS(-1) + 1.273*NNRID(-1) - 178.630) + C(39)*(NCB(-1) + 13.467*RDS(-1) + 0.433*NNRID(-1) + 41.219) + C(40)*D(FDIINFL(-1)) + C(41)*D(NEA(-1)) + C(42)*D(NCB(-1)) + C(43)*D(RDS(-1)) + C(44)*D(NNRID(-1)) + C(45)

R-square	0.675	Mean dependent var	37.949
Adjusted R-square	0.459	S.D. dependent var	139.083
S.E. of regression	102.244	Sum squared resid	125448.100
Durbin-Watson stat	2.203		

[(dL=0.102, dU=3.227) on 1% level of significance]

[(dL=0.160, dU=3.335) on 1% level of significance]

6.2.7 Granger Causality Test

The first row of below table 6.2.7 revealed that the null hypothesis, NEA does not Granger Cause FDIINFL, cannot be rejected, the level of significance is not desirable. NEA does not cause FDIINFL. In the second row the null hypothesis, FDIINFL does not Granger Cause NEA, is accepted at 15.8 percent level of significance and therefore, FDIINFL does not cause

NEA. So, there is not a bidirectional or unidirectional causal relationship between FDIINFL and NEA.

The third row of below table 6.3.7 revealed that the null hypothesis, NCB does not Granger Cause FDIINFL, cannot be accepted, the level of significance (3.2 percent) is desirable. NCB cause FDIINFL. In the fourth row the null hypothesis, FDIINFL does not Granger Cause NCB, can not accept at 7.5 percent level of significance and therefore, FDIINFL Granger Cause NCB. So, there is a bidirectional causal relationship between FDIINFL and NCB.

Null hypothesis, RDS does not Granger Cause FDIINFL, cannot be rejected, the level of significance is not desirable in fifth row. RDS does not cause FDIINFL. In the sixth row the null hypothesis, FDIINFL does not Granger Cause RDS, is accepted therefore, FDIINFL does not cause RDS.

Seventh row shows that the null hypothesis, NNRID does not Granger Cause FDIINFL, is accepted, the level of significance is not desirable. NNRID does not cause FDIINFL. In the eighth row the null hypothesis, FDIINFL does not Granger Cause NNRID, can not accept. NNRID and FDIINFL cause to each other. So, FDIINFL and NNRID have unidirectional relationship.

Table 6.2.7: Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.	Relationship Uni / Bidirectional
NEA does not Granger Cause FDIINFL	21	0.969	0.401	No relation
FDIINFL does not Granger Cause NEA		2.074	0.158	
NCB does not Granger Cause FDIINFL	21	4.326	0.032	↔ Bidirectional
FDIINFL does not Granger Cause NCB		3.062	0.075	
RDS does not Granger Cause FDIINFL	21	0.939	0.412	No relation
FDIINFL does not Granger Cause RDS		1.133	0.347	
NNRID does not Granger Cause FDIINFL	21	2.214	0.142	Unidirectional →
FDIINFL does not Granger Cause NNRID		3.359	0.061	

6.2.8 Result summery of FDI inflow, NEA, NCB, RDS and NNRID

Empirically, the results are verified by the help of econometric models. (FDIINFL) inflow of foreign direct investment, (NEA) net external assistance, (NCB) net commercial borrowing, (RDS) rupee debt service and (NNRID) net NRI deposit these are the variables under this chapter to investigate the relationship among them with inflow of foreign direct investment.

All the variables are non stationary at level and become stationary on 1st difference and 2nd difference. Johnson co-integration confirms the co-integration equation by the value of trace and max statistics on the 10 percent level of significance test indicate 2 co-integration equation.

Result of normalized equation also confirms the long run relationship of foreign direct investment with net external assistance, net commercial borrowing, rupee debt service and net NRI deposit. Net external assistance and net NRI deposit has positive long run association with foreign direct investment.. One billion rupees rise in NEA induces the 50 billion rupees, i.e. more than proportionate rise in FDI in India. But investment promotion agencies help to terminate the external assistance by FDI inflow (Jacques Morisset, 2003). Net commercial borrowing and rupee debt service have negative association with foreign direct investment in long run.

Vector error correction model gives the very lower value of coefficient which is 6.66 percent. All the variables under this chapter adjust the inflow of foreign direct investment with lower speed.The viability of VECM model is checked by the regression of coefficient of VECM model which are used as targeted model equation.

Causality test confirms bidirectional relationship between net commercial borrowing and inflow of foreign direct investment. Inflow of foreign direct investment cause to net NRI deposits in unidirectional relationship. Remain variables under this chapter does not have any relationship. Correlation coefficient of rupee debt services has highly positive relationship with inflow of foreign direct investment.

Chapter: 7
Major findings, conclusions and policy suggestions

7.0 Findings and conclusions

Large amount of literature analyzed the contribution of FDI in an economy. Most of the empirical work found that the FDI plays an important role in the development of different sectors of an economy. Early 1990's have brought recessions in developed nations and that swing of the international business cycle almost certainly made profit opportunities in developing countries which appear relatively more attractive (Calvo Guillermo A.et al. 1993).Countries desire to open their economy because FDI is the non-debt funds which contribute to connect the different segments of the economy. FDI inflow and macroeconomic variables have different types of relationship (as explained in chapter 1 and 3).

Numerous empirical studies have conducted to investigate whether FDI inflow has influenced to macroeconomic variables or macroeconomic variables influenced the inflow of FDI. The overall evidences are best characterized as mixed type results. Nexus of results are reviewed in literature. For instance, Shylajan C S (2011), found that inflation has negative impact on FDI in India.FDI has negative impact on employment generation in retail sector in India (Nizamuddin Mohammed, 2013), therefore it enhance unemployment. Government expenditure in form of development expenditure has a positively significant effect on the FDI inflow in Africa (Anyanwu John C 2011). Kaur Mandeep et al (2014) found positive impact of FDI on gross capital formation in India. Salahuddin Mohammad et al (2010) found that the foreign direct investment and gross domestic saving are complements in case of developing country. Calvo Guillermo A. et al. (1996) found that the substantial portion of the surge in capital inflows has channeled to accumulation of foreign exchange reserve. Real exchange rate recorded negative associated with inflow of FDI (Goldberg and Klein, 1998). Asiedu (2002) found that trade openness also promotes FDI. Nexus result of relationship between

macroeconomic variables and FDI inflow found with selected variables in Indian context. Further, this study extended and prompted with the addition of more variables to investigate the relationship of FDI inflow and endogenous and exogenous macroeconomic variables.

The main objective of this study was to examinethat whether FDI has any significant effect on macroeconomic variables. The study has accordingly included the different endogenous and exogenous macroeconomic variables to investigate the causal relationship with FDI inflow.

For the purpose, different econometrics tests such as ADF, PP, Johansen co-integration, VECM and Granger Causality test has been used to analyse the relationship between FDI inflow and macroeconomic variables(as discussed in chapter 3). The major findings of the study are discussed as below.

7.0.1 Major findings of FDI and endogenous macroeconomic variables

In this section, major findings of relationship investigation between FDI inflow and inflation, unemployment, gap of output growth, development expenditure, non-development expenditure, gross domestic saving and gross fixed capital formation are discussed:

- The study finds that during the different phase of time both endogenous and exogenous variables fluctuated by both internal and external uncertainties. For example uncertainties due to global environment and reform of first stage and second stage of the Indian economy. Internal and external economic and political environment is also the reason for the fluctuation of macroeconomic variables as supported by Elif Arbatli (2011) and Keshava S.R. (2008).

- The study confirms the co-integration among the Inflow of foreign direct investment and endogenous macroeconomic variables by Johnson co-integration test (result

reported in chapter 5). Trace and max statistics confirm the co-integration between FDI inflow and inflation, unemployment, development expenditure, non-development expenditure gross fixed capital formation and gross domestic saving.

- However, the study found that the inflation has insignificant value and yet the positive relationship with inflow of foreign direct investment. Further, this study found the unidirectional relationship between inflow of Foreign Direct Investment and inflation. Inflationary pressure is an obstacle to start a new venture or Inflation is an interruption for green field investment and good for brown field investment. It is also observed that the higher inflation rate attract more FDI inflow in different years. Khan Gholam Syedain (2014),did not find causality between FDI and inflation in India. Contradictory, Tripathi Vanita et al (2012), found that the inflation granger caused by FDI inflow in case of India. This result supported by Khan Gholam Syedain et al. (2014) as positive relation in Indian context. Different views also given by Faiza Saleem et al. (2013), positive relationship exists between foreign direct investment and inflation and Jason Kiat (2007), Inflation negative impact on FDI. Shylajan C S (2011), also found the negative impact of inflation on FDI in Indian context.

- The study found that the unemployment has significant positive relationship with inflow of foreign direct investment. This study also found the unidirectional relationship between inflows of foreign direct investment and unemployment. The nexus of result found in the literature which varies country to country and sector to sector.FDI is not having a significant impact on unemployment in case of India, engagement of uneducated and semi-educated people at various sectors is less than engagement of educated workforce in service, retail and manufacturing and big industries in small strength, comparatively (Gupta Nidhi, 2013).FDI has negative

impact on employment generation in India (Nizamuddin Mohammed, 2013),therefore it generates unemployment. FDI create jobs for skilled employee in India for service sector (Someshu Pakanati, 2015).Shu-Chen Chang (2006) has not found any significant association between unemployment and inflow of FDI.

- Development expenditure has significantly value of coefficient (0.28) and positive relationship with inflow of foreign direct investment. One unit increase in development expenditure induces FDI inflow less than proportionate. This study also found the unidirectional relationship between development expenditure and inflow of foreign direct investment.FDI inflow is a complementary for development expenditure. Government expenditure is positively significant effect on the FDI inflow in Africa, a developing nation (Anyanwu John C 2011).

- Non-development expenditure has also significant value of coefficient (-0.12) and negative relationship with inflow of foreign direct investment. One unit decrease in non-development expenditure induces FDI inflow which is also less than proportionate. This study also found the unidirectional relationship between inflow of Foreign Direct and non-development expenditure. Large proportion of public spending is attributed to non-development expenditure in developing country (Husnain Muhammad Iftikhar ul 2011). Greater the growth rate of public spending smaller the FDI. FDI affects growth positively while public spending retards economic growth (Husnain Muhammad Iftikhar ul 2011).

- This study found that the gross fixed capital formation has significant coefficient value (0.32) and positive relationship with inflow of foreign direct investment. One billion rupees gross fixed capital formation (GFCF) induces less proportionate FDI

inflow. Gross fixed capital formation and FDI inflow has unidirectional relationship reference to this study. However, the complementary relation between GFCF and foreign investment is examined by (Roy Samrat and Mandal Kumarjit 2011). Kaur Mandeep et al (2014) found positive impact of FDI on gross capital formation in India.

- The significant coefficient value of GDS (-0.20)Gross domestic saving has negative relationship with inflow of foreign direct investment. Decrease in domestic saving increase FDI inflow. Gross domestic saving and FDI inflow has also unidirectional relationship in this study. Salahuddin Mohammad et al (2010) found the bidirectional relationship between foreign direct investment and gross domestic saving. Leshoro Temitope L.A. (2014) found that FDI and saving has not causality relationship in case of South Africa. Salahuddin Mohammad et al (2010) found that the foreign direct investment and gross domestic savings are complements in case of developing country. Chung chen, et al.(1995) had notfound the effect of FDI on domestic saving.

- The significant coefficient of error correction method confirms that the Inflation, Unemployment, Gap of Output growth, gross fixed capital formation and gross domestic saving are the independent variables which significantly effects the Inflow of foreign direct investment in long run. Some short run coefficients of studied variables also influence the inflow of foreign direct investment in short run. (Analysis given in Chapter 5).

7.0.2 Major findings of FDI and exogenous macroeconomic variables

In this section, major findings of relationship investigation between FDI inflow and foreign reserve, exchange rate, trade openness, net external assistance, net commercial borrowing, rupees debt service and net NRI deposits are reported below (analysis given in chapter 6):

- This study confirms the co-integration among the Inflow of foreign direct investment and exogenous macroeconomic variables by the Johnson co-integration test (trace and max statistic) (result reported in chapter 6).

- In this study, it is found that the inflow of foreign direct investment (value of coefficient 2.77) has significant positive relationship with foreign reserve. This study confirms the bidirectional relationship between foreign reserve and FDI inflow. In 2006-07 and 2007-08, higher foreign reserve observed with higher growth rate of FDI inflow (observations reported in chapter 4). Sonawane Mukunda (2015), found positive relationship between foreign reserve and FDI inflow in India. Calvo Guillermo A. et al. (1996) found positive relationship between FDI inflow and foreign reserve.

- This study found that exchange rate (weak rupees and per dollar value) (value of coefficient 140.92) has significant positive relationship with inflow of foreign direct investment. Higher growth rate for exchange rate observed in 1998-99 and lower FDI inflow. Strong position of Indian currency hurts the sentiments of foreign investors (observations can be captured from appendix and chapter 4). Sonawane Mukunda (2015), found positive relationship between exchange rate and FDI inflow in India. This result is supported by Khan Gholam Syedain et al. (2014). Contradictory,

exchange rate has negative association with inflow of FDI (Goldberg and Klein, 1998).

- This study found that the trade openness has negative relationship with FDI inflow but it was found insignificant.Trade openness and foreign direct investment has also unidirectional relationship with less significant value of probability. Tripathi Vanita et al (2012), found that the openness granger caused by FDI inflow in case of India. Contradictory, Sonawane Mukunda (2015), found positive relationship between openness and FDI inflow in India.Elizabeth Asiedu (2002) found that trade openness promotes FDI.

- The study found that the net external assistance has significant positive relationship with inflow of foreign direct investment. One billion rupees increase in net external assistance increase inflow of FDI which is highest than proportionate. In 1990-91, net external assistance was 39 billion rupees and 69 billion rupees in 2012-13. It was 31 percent of FDI inflow in 1990-91 and reduced by 3 percent in 2012-13. Investment promotion agencies help to terminate the external assistance by FDI inflow (Jacques Morisset, 2003).

- The study found that the net NRI deposit has significant positive relationship with inflow of foreign direct investment. One billion rupees increase in net NRI deposit increase inflow of FDI which is highest than proportionate. In 1990-91, net NRI deposit was 27.56 billion rupees and 807 billion rupees in 2012-13. Higher growth rate in NRI deposits recorded in 1992-93,1995-96, 1996-97, 2000-01, 2006-07 and 2011-12, and FDI inflow has been the positive growth rate flow during these periods (as observed in chapter 4).Granger causality test confirm that the inflow of Foreign

Direct Investment cause to net NRI deposits which has unidirectional relationship. Bajpai Nirupam et al. (2000) said that commercial borrowing from NRIs became disaster that was the cause when lots of short term capital had come in and lots had moved out.

- Net commercial borrowing and inflow of foreign direct investment significantly negatively relationship in long run the value of coefficient is (-23.37). Net commercial borrowing has also bidirectional relationship with Inflow of Foreign Direct Investment. Compare to 2012-13 commercial borrowing was less than in 1990-91.

- Rupees debt service and Inflow of Foreign Direct Investment has significantly negative relationship in long run. One billion rupees reduction in rupees debt service increases FDI inflow more than proportionate. The gap of outgoing flow of rupees and incoming flow of rupees was higher in 1990-91 and lower in 2012-13.

- Significant value of ECM confirms that foreign reserve, exchange rate and trade openness, these are the independent variables which are significantly adjust the Inflow of foreign direct investment in long run. Some short run coefficients of studied variables also influence the inflow of foreign direct investment.

7.1.1Hypothesis test results of FDI and Endogenous macroeconomic variables

On the basis of the finding the study results of the H_0 are discussed below:

- H_o :FDI inflow does not cause inflation, unemployment and gap of growth output.

$H_0$is **not accepted** for unidirectional causal relationship between FDIINFL and GNPDIFL, FDIINFL and UNOKUN.

- H_o : FDI inflow does not cause development expenditure and non-development expenditure.

  $H_0$is **not accepted** for unidirectional causal relationship between DE and FDIINFL, FDIINFL and NDE, and NDE and DE.

- H_o : FDI inflow does not cause gross fixed capital formation and gross domestic saving.

  $H_0$is **not accepted** for unidirectional causal relationship between GFCF and FDIINFL, and GDS and FDIINFL.

7.1.2Hypothesis test results of FDI and Exogenous macroeconomic variables

On the basis of the finding the study results of the H_0 are discussed below:

- H_o : FDI inflow does not cause foreign reserve, annual exchange rate and trade openness.

  $H_0$is **not accepted** for bidirectional causal relationship between FR and FDIINF.

- H_o : FDI inflow does not cause net external assistance, net commercial borrowing, rupees debt services and net NRI deposits.

  H_0 is **not accepted** for bidirectional causal relationship between NCB and FDIINFL, and unidirectional for FDIINFL and NNRID.

7.2Policy Suggestions

Capital inflow in developing countries has been seen as beneficial by all parties. For the capital-rich developed economies, such investment appear a desirable way of diversifying risk and investing in productive assets that will, in a few decades, fund the retirement of the baby boom generation. The main policy decisions involve the interaction among foreign direct investment, exchange rate, monetary policy, fiscal policy and aggregate economic variables. Foreign direct investment inflows can lead to inflationary pressures, especially when they are monetized. FDI inflow of capital also implies a higher demand for a nation's currency; it often means an appreciating exchange rate, which may widen the trade deficit to uncomfortable levels. Overall, in a world of high capital mobility, where capital inflows can depart just as rapidly as they arrived, there is a genuine risk that their effects on inflation, the exchange rate, financial sector and on aggregate economic variables can lead to severe macroeconomic instability.

Some policies suggestions based on major finding of this study are discussed herewith:

- Monetary and Fiscal policy: This study found that the inflation and unemployment has positive relationship with inflow of foreign direct investment. Brown field investment is the option for foreign investors to earn profit. We should focus on green field investment to establish new projects and provide employment. Engagement of uneducated and semi-educated people at various sectors like service, retail and manufacturing is at minimum level. Contribution of primary sector is lower in GDP and highly dependency for employment. The contribution of service sector is higher in GDP but it provides employment only to educated labour force. So, sterilization and regulation are the most popular policies response to FDI inflow in both Latin America and Asia, aims to insulate the money supply, exchange rate from the effect of FDI inflows. The intent is to mitigate inflationary pressures and avoid the loss of

control over the domestic money stock. There should be a greater control on banks amount to a reversal of the underlying trends of financial liberalization in developing countries. Changes in legislation and sensitive political actions usually cannot be undertaken on short notice, which would often be needed to offset the effects of the capital inflows. Fiscal policy consideration suggest that taxes and expenditures should be set to reflect long term goals, rather than in response to what can be excessively volatile fluctuations in international capital market. Policy makers should also be focused on vocational education and technical education because skilled labour attracts more FDI.

- Diversified FDI: As this study found positive relationship between development expenditure and gross fixed capital formation and inflow of foreign direct investment. Non-development expenditure and gross domestic saving has negative relationship with inflow of foreign direct investment.FDI inflow is a complementary for development expenditure and domestic capital. The saving money is either kept with the public or is invested back. When the money is invested back, we come to the figures known as capital formation. So it is necessary to boost the productivity. Capital formation is dependent on the reinvestment which is repatriated in form of profit. In certain cases non-availability of items in India; they have to form a joint venture with respective companies in such fields to manufacture such items within the boundary of the nation and no imports to be allowed. No brown field expansion would be allowed and only green field capacity building to be allowed. So far, the focus of policy and analysts has been mainly on FDI as an aggregate. Policy makers should focus much more on attracting diverse type of FDI to fulfill the requirement of non-development expenditure and shortage of funds due to lower saving.

- Controlling FDI inflow: External assistance, NRI Deposit has positive relationship with FDI inflow. Commercial borrowing and rupees debt service has negative relationship with FDI inflow. Various countries, such as Chile and Colombia, have imposed taxes on short term borrowing abroad with intent to discouraging inflows that are thought to be particularly speculative. Chile chose to tax inflow by imposing a reserve requirement on international loans intermediated through the banking system. Policies should be in favor of controlling on short term external assistance and NRI deposit. Bajpai Nirupam et al (2000) said that commercial borrowing from NRIs became disaster that was the cause when lots of short term capital had come in and lots had moved out. Investment promotion agencies help to terminate the external assistance by FDI inflow (Jacques Morisset, 2003).
- Exchange rate and foreign reserve policy: This study found that the weak currency attracts more FDI inflow and increase foreign reserve. Increased exchange rate flexibility grants the monetary authorities a greater degree of autonomy in the conduct of domestic monetary policy and permits them to exercise more control over the monetary aggregates. Several countries have adopted crawling exchange rate bands, which can be seen as an intermediate case between fixed and flexible exchange rates. In, 1994, for example Colombia joined Chile and Mexico in adopting a preannounced crawling exchange band. Exchange rate and price stability must be foremost priority for the Indian economy to attract the FDI as these are estimated to be important factor influencing FDI inflow in the country. India can build a state of confidence among the foreign investors through taking effective measures for controlling fluctuation in exchange rate and price level in a country. Most attention should be paid the stabilization as a necessary condition for foreign investment attraction strategy in India.

- Absorption Capacity: The opening of the economy to foreign trade and the policy of permitting foreign direct investment not only forced the domestic manufacturers to compete globally, but it also progressively made the plant managers and government official develop and adopt the rules and the laws of market economy. These changes will inevitably propelled the domestic economy toward greater reliance on the market with improve in management, variety, quality, cost and achieve better economic results.
- FDI Promotion method: such kind of attitude toward FDI by Indian authorities can give fruitful incentives. Various legislated investment incentives should be offered during the project consultation and the joint-venture approval process gradually should be simplified as more final decisions allows at the local level. Promulgate various investment and ownership laws, the increase in the security of private property rights and contracts created greater confidence among the foreign direct investors, leading to the increase in FDI.

There should be favorable economic environment in terms of increasing efforts like soft and hard approach in form of provision of subsidies raw material, power, and land and tax concession and political stability for the better development of macro variables. Development expenditure, Output growth, Gross fixed capital formation and Gross domestic saving these are showing the sound position of an economy which helps to create the possibility for the inflow of foreign direct investment. So, the opportunities for the employment, to combat with inflation, to increase the foreign exchange reserve, to boost the trade, to increase the development of infrastructure and to bridge the gap of capital account with non-debt fund can be generated.

7.3Limitation of the Study

There are many constraints in this study. This constraint comes in the forefront to carry out such an exercise, which does not have all the information at a single space. The empirical study in social science, especially aggregate variables based on the secondary information to investigate the relationships cope with many problems. There are following limitations of the study:

- The present study is based on macroeconomic variables or aggregate data consisting of yearly data and hence will not capture the micro level information of the variables.
- The major limitation of this study is the non-availability of data on unemployment and employment in unorganized sector.No source provides comprehensive, regular and reliable data. Census of India collects data on labour force with a gap of 10 years. Similarly National Sample Survey Organisation(NSSO) conducts survey after five years. The number of unemployed registered with employment exchanges is also highly unreliable. Moreover, definition of unemployment adopted by these sources is also not uniform.
- The variables taken in the study are selected on the basis of availability of data. However, the selected variables represent the phenomenon appropriately as a number of other studies have adopted almost similar variables for the purpose.

7.4 Further Research Analysis

The present study is the investigation of bidirectional relationship. This research can be modified further by measuring the unexpected change in FDI and predicting its effects on the future values of the selected macroeconomic variables. This study can be modified further in below given process:

- This study can be extended to increase the time series or cross section data of the study which is depended on the availability of data. Number of variables can be increase.
- This study, further, can be extended to another developing country to compare their policy phenomena regarding the inflow of FDI. Comparative analysis can be made among different countries on the base of this study.
- It can be further diversified with sector or regional wise causal relationship of FDI inflow and macro variables.

In recent years, India has been attracting the inflow of FDI in different sectors with the assumption to provide employment, create infrastructure, to become self-dependent in future. In this regard it is suggested that a causative relationship between macro variables and FDI inflow can be an interesting area of research.

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Appendix

Appendix 4 (Billion Rupees)

Year	FDI Inflow (FDIINFL)	GNP Difl (GNPDIFL)	Unemployment (OKUN)	Labour Market GY-GEY	Developmental expenditure (DE)	Non-developmental expenditure (NDE)	Gross Domestic Capital Formation (GDCF)	Gross Domestic Savings (GDS)
1990-91	1.74	0.39	-0.628		586.45	493.49	3794.36	3341.93
1991-92	3.16	0.45	-0.352	-0.206	593.13	551.7	3167.69	3094.87
1992-93	9.65	0.49	-0.212	-0.122	654.79	605.84	3577.1	3300.13
1993-94	18.38	0.53	-0.105	-0.102	724.64	735.86	3659.48	3570.84
1994-95	41.26	0.59	-0.042	-0.064	828.03	824.02	4372.24	4171.13
1995-96	71.72	0.64	-0.005	-0.04	844.27	986.32	4712.42	4396.58
1996-97	100.15	0.69	0.02	-0.027	941.97	1122.17	4755.26	4504.32
1997-98	132.2	0.74	0.066	-0.052	1109.94	1278.2	5462.85	5159.85
1998-99	103.58	0.79	0.087	-0.024	1372.57	1502.98	5669.3	5430.82
1999-00	93.38	0.82	0.08	0.009	1291.51	1779.28	6669.08	6396.94
2000-01	184.06	0.85	0.112	-0.038	1393.86	1974.7	6300.56	6148.45
2001-02	292.35	0.88	0.127	-0.019	1593.64	2154.56	6588.27	6752.4
2002-03	243.67	0.91	0.148	-0.025	1841.97	2427.49	7086.37	7407.94
2003-04	198.6	0.95	0.133	0.018	1954.28	2432.98	8199.25	8859.12
2004-05	271.88	1	0.114	0.022	2149.55	2629.04	10640.41	10507.03
2005-06	396.74	1.04	0.082	0.039	2290.6	2906.77	12369.27	11938.16
2006-07	1033.67	1.11	0.046	0.041	2557.18	3412.78	14023.69	13606.81
2007-08	1401.8	1.17	-0.003	0.054	3256.7	4007.28	16568.92	16007.28
2008-09	1615.36	1.27	0.006	-0.009	4713.99	4281.45	15703.33	14656.43
2009-10	1763.04	1.35	-0.033	0.041	5282.42	5141.01	18412.63	17003.95
2010-11	1589.36	1.47	-0.09	0.058	6660.69	5514.71	21203.77	19581.43
2011-12	2186.83	1.59	-0.116	0.025	7112.76	6361.94	21318.39	18765.62
2012-13	1865.27	1.72	-0.108	-0.008	7767.11	7385.14		
Average	592.08	0.93	-0.03	-0.02	2500.96	2630.86	9284.3	8845.55
S.D.	737.92	0.37	0.18	0.06	2225.64	1975.32	5985.31	5467.06
C.V.	1.25	0.39	-6.1	-3.25	0.89	0.75	0.64	0.62

Source : Researve Bank of India

Appendix 5 (Billion Rupees)

Year	FDI Inflow (FDIINFL)	Net External assistance (NEA)	Net Commercial borrowings (NCB)	Rupee debt service (RDS)	Net NRI deposits (NNRID)	Foreign Reserve (FR)	Average Exchange Rate (AER)	Openness (OPEN)
1990-91	1.74	39.65	40.34	-21.4	27.56	114.16	17.943	0.124
1991-92	3.16	73.95	38.06	-27.85	10.07	238.5	24.474	0.093
1992-93	9.65	57.48	-10.95	-23.35	60.97	307.44	30.649	0.114
1993-94	18.38	59.63	19.04	-33.02	37.8	604.2	31.366	0.13
1994-95	41.26	47.99	32.39	-30.9	5.39	797.8	31.399	0.148
1995-96	71.72	33.57	45.49	-31.05	38.22	743.84	33.45	0.185
1996-97	100.15	39.97	100.03	-25.42	118.94	949.32	35.5	0.194
1997-98	132.2	34.63	145.58	-27.84	43.25	1159.05	37.165	0.206
1998-99	103.58	34.84	185.57	-33.08	40.59	1380.05	42.071	0.219
1999-00	93.38	39.15	13.6	-30.59	67.09	1659.13	43.333	0.239
2000-01	184.06	20.8	201.94	-27.6	105.61	1972.04	45.684	0.26
2001-02	292.35	58.19	-75.43	-24.57	131.27	2640.36	47.692	0.261
2002-03	243.67	-148.63	-82.63	-23.06	144.24	3614.7	48.395	0.305
2003-04	198.6	-125.53	-132.74	-17.56	168.69	4901.29	45.952	0.337
2004-05	271.88	89.93	241.49	-18.58	-44.39	6191.16	44.932	0.425
2005-06	396.74	78.76	116.1	-25.57	124.57	6763.87	44.274	0.502
2006-07	1033.67	80.27	738.89	-7.25	195.74	8682.22	45.285	0.582
2007-08	1401.8	84.84	912.12	-4.92	7.05	12379.65	40.241	0.631
2008-09	1615.36	131	309	-4	204	12838.65	45.917	0.813
2009-10	1763.04	153	119	-4	144	12596.65	47.417	0.746
2010-11	1589.36	226	539	-3	148	13610.13	45.577	0.852
2011-12	2186.83	121	421	-4	582	15061.3	47.923	1.093
2012-13	1865.27	69	466	-3	807	15884.2	54.409	1.201
Average	592.08	56.5	190.56	-19.64	137.72	5438.68	40.48	0.42
S.D.	737.92	76.9	265.65	11.12	190.83	5546.73	8.8	0.33
C.V.	1.25	1.36	1.39	-0.57	1.39	1.02	0.22	0.78

Source : Researve Bank of India

Endnote

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