An Analysis of Macroeconomic Uncertainty and FDI in Developing Countries

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IN
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CERTIFICATE

This is to certify that the thesis entitled "***An Analysis of Macroeconomic Uncertainty and FDI in Developing Countries***" submitted for the award of the degree of Doctor of Philosophy in Economics is based on the original research work done by Mr. Pradeep Kumar Das at the Department of Economics, Pondicherry University under my supervision and guidance. The thesis has not formed the basis for the award to the candidate of any degree, diploma, fellowship or other similar title before.

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Dedicated to Those Who are Still Deprived of Education

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Background, Objectives and Methodology

1.1. Introduction

Investment is made with the hope that it will generate income in the future. Source of investment may be the domestic source or from abroad. Countries, which are in the transition stage, find tough to generate enough saving to match with the capital requirement. International capital acts as a bridging instrument between domestic saving and investment. Opening up of the economies and the outward-looking motive of governments have resulted in many fold rise of international capital flow among countries. Foreign investment not only supplements domestic investment but also acts as a channel through which technological know-how is transmitted to the domestic economy. According to Nurkse (1953), capital accumulation kicks-off development process. Capital accumulation is the precondition to come out of the vicious circle of poverty and initiate development process of countries which is below par the growth scenario of developed countries.

Recent years have experienced many major changes in the form and structure of international capital. Over the years the foreign fund has evolved into many investment instruments and destinations. The modern era is capable of attracting foreign fund in the shortest time possible due to the tremendous change in the information technology.

There is no unique reason to invest away from home. Some decision is driven by the intention to invest in a country where natural resources are plenty. Investment motive of this type is termed as “resource seeking” motive. Another type of investment decision is

due to high rate of tariff, as many a time multinationals invest in a country where tariff rate is high so as to avoid the trade restriction. Horizontal Foreign Direct Investment (FDI), which is also known as tariff Jumping FDI known to be an alternative option if trade restriction is high in a particular nation. Horizontal FDI takes place among the countries of the same level of development, whereas vertical FDI takes place among countries with different level of development. Vertical FDI is more common if the investment decision is driven by risk diversification hypothesis. When investment is diversified there will be a cluster of the production unit and it has to be assembled in a particular place or point. Vertical FDI is a form of FDI in which the motive of investment is resource seeking rather than market seeking. In this research analysis, aggregate FDI inflow is taken into consideration.

FDI is a non-debt form of capital and plays a significant role in the development process of a country. Recent years have witnessed a dramatic rise in the flow of capital towards developing economies. More than the half of global FDI share is shared by developing countries, confirmed by UNCTAD report 2013.

World economy at large has opened up never before and subsequently many fold rise in FDI across nations. The role of FDI is phenomenal when it comes to capital stock, employment generation, productivity and technological transfers as emphasized by Bénassy-Quéré, Fontagné and Lahrèche-Révil (2001), Goldberg and Klein(1997) & Kiyota and Urata (2004). FDI is a stable and long-term form of capital investment due to which preferred to portfolio investment. Portfolio investment can easily move away from a country and sometimes turns counterproductive.

The Organization for Economic Co-operation and Development (OECD) defines FDI as the amount reported corresponds to cross-border equity transactions between residents and non-residents which qualify as FDI (i.e. ownership of at least 10 percent of voting power).

World Bank defines Foreign Direct Investment net inflow in the following word "FDI net inflows are the value of the inward direct investment made by non-resident investors in the reporting economy."

The International Monetary Fund (IMF) defines FDI as when one individual or business owns 10% or more of a foreign company's capital. Foreign institutional investment is volatile, short-term in nature and sometimes counterproductive when moves at an unanticipated pace. FDI being a stable form of the foreign fund is welcomed by policymaker and government. FDI involves active participation in management, joint-venture, transfer of technology and expertise.

FDI has seen a key component of growth performance of many economies, especially for developing ones. It is widely considered to be a major factor that drives economic growth (e.g.Lim (2001), Caves (2007), Dunning and Lundan(2008) & Franco (2013)).

FDI being a form of long-term capital is stable and positively influence the growth process. The need for FDI is paramount especially in emerging economies where saving always lags behind the required investment. Capital flows, in the form of FDI not only supplement the domestic investment but also works as a channel of knowledge and skill transformation from one part of the globe to another. FDI is desirable as it helps the diffusion of technology among the less developed countries.

FDI on the one hand foster productivity and on the other generate employment opportunity for the unemployed. Developing Countries where unemployment problem is acute embrace foreign capital in the form of FDI. FDI has become an integral component of development strategy and often feature in economic agenda of developing countries. Developing countries are keen on attracting foreign capital and FDI is no exception. The recent decade has witnessed a significant change in policy framework favoring FDI by removing the artificial restriction.

1.2. Importance of Foreign Capital

Foreign Direct Investment is a major and stable form international capital flow. It signifies not only capital presence, but also a means through which innovative ideas spread beyond the domestic territory where initially originates.

It is a valuable means of capital due to its role in the transfer of technology. The difference between Foreign Institutional Investment (FII) and Foreign Direct Investment (FDI) is a matter of degree of capital flow. Foreign Direct Investment (FDI) is a direct investment into production or business in a country by an individual or company in another country, either by buying a company in the target country or by expanding operations of an existing business in that country. FDI is a mere a transfer of ideas, skill and management from the home country to host country. Home country is the country from where investment originates and the destination of investment is known as the host country.

Gheorghe and Vasile (2012) conclude that though FDI is regarded less volatile than FII, there is also a possibility for foreign firms to leave host country if they find more attractive profit opportunities somewhere else. The time horizon of Foreign Direct Investor is more vis-à-vis portfolio investor. The empirical study of Albuquerque (2003) confirms the fact that FDI is less volatile than portfolio investment.

Due to the productive aspect of FDI, policymakers at large formulate policies so as to make their country more attractive for foreign capital.

1.2.1. Importance of Foreign Direct Investment in Developing Countries

Capital inflows can be of two types: portfolio investment and Foreign Direct Investment.

FDI is widely considered as one of the preferred international capital due to its resilience during financial crises vis-à-vis Debt and equity (Kottaridi and Siourounis (2007)). Sometimes amid crisis ownership transfer takes place if other forms of international investment disappear (Krugman, 1998).

Many studies throw light on the positive aspect of FDI and how the arrival of foreign fund stimulates technology. FDI stimulates technological advancement by means of providing required capital and skill and in turn, improves the productivity of the hosts (Bekhetand Mugableh (2013), Chudnovsky and Lopez (1999), Fedderke and Romm(2006) &Singhania and Gupta (2011)). The other group of researcher believes that FDI brings crowding effect on domestic investment by the destructive competition of foreign multinationals.

Many policy frameworks are in place in order to attract foreign capital. The belief is that, on the one hand, the foreign fund will complement domestic investment and on the other, it will create a better technological space for the domestic firm.

There has been a phenomenal change in the perception of developing countries towards foreign capital and countries in the course of making their territory as a favored destination for multinationals to attain sustainable development (Cassidy and Callaghan (2006) &Erdal and Tatoglu (2002)).

The dilemma whether foreign capital will act as boon or bane no longer exists. Developing countries, which are more desperate to achieve higher growth rate, are following policy framework so as to provide enough competitive advantage for multinationals. The so-called competition to attract more and more foreign capital is termed as "Race to the bottom" policy. It is all about providing a better business environment for multinationals. And hence the need for more focused policy to have a stable macroeconomic picture of a country is inevitable to make the country competitive to attract a significant amount of capital flow. Stable macroeconomic scenario reduces production and transaction cost of multinationals.

The world has become more integrated than before. Capital inflow to developing countries has shown a tremendous rise. Capital inflow is viewed as the as the solution to various problems that developing countries often encounter. Several problems of developing countries can be sorted out by the capital inflow. Foreign Direct Investment (FDI) is considered superior to portfolio investment as it brings technological know-how into developing countries.

1.2.2. Foreign Direct Investment and Economic Growth

The role of FDI on growth is quite significant. Calderón and Schmidt-Habbel (2003) in an empirical study find the role of FDI for long-term growth. Other studies like Borensztein et al. (1998) conclude that the role of FDI in the growth process of developing countries is greater than the domestic investment.

Investors are also attracted towards countries where growth prospect is bright. The strong economic condition is inherent in describing the flow of capital. Favorable market expansion due to real GDP growth is a precondition of channelizing capital into the concerned markets. Investors always keep a vigil look at the growth performance of countries before placing their investment in those countries.

Balasubramanyam et al. (1996) and Borensztein et al.(1998) studied the relationship between FDI and economic growth. They found a positive correlation between these two but only under the certain condition. Balasubramanyam et al. (1996) found the linkage between FDI and growth is strongest in cases LDC which resort on export promotion instead of import substitution. Borensztein et al. (1998) find that FDI influences economic growth positively only after the country attains human capital threshold.

Carkovic and Levine (2002) by using dynamic panel technique find no effect of FDI on economic growth. Choe (2003) relying on the Granger causality technique on the panel data for the time period from 1971 to 1995 also find little impact of FDI on economic growth.

Alguacil et al. (2011) by analyzing the time period from 1976-2005prove the point that the impact of FDI on growth is robust in less developed economies than the developed ones. This is so because FDI meets the capital need in the less developed country and

contributes to economic growth of host country. The authors finding is consistent with the idea of the spillover effect of FDI which are common in less developed countries.

Both backward and forward linkages are quite common with FDI into less developed economies. This is the reason why attracting FDI has become the essential element in the development strategy of major developing economies. However, institutional environment and macroeconomic condition of the country do play an important role along with the foreign capital for the country to achieve a higher rate of growth is confirmed by the authors' analysis. The authors confirm the importance of a separate analysis for a different degree of economic development.

Sun (1998) analyzing the data of China confirms that opening up of the economies and market-oriented policy have resulted in many favorable changes in economic structure. Direct Foreign Investment (DFI) contributes to the growth scenario of the host country in many ways. Both backward and forward linkages effects are associated with the arrival of foreign fund. Direct Foreign investment improves the connectivity of host country with the international market and raises the export potential, which in turn results in economic growth. DFI creates an investment environment that facilitates and also encourages domestic investment. The study points out the role of foreign investment on growth along with its role towards encouraging domestic investment. DFI facilitates product efficiency and also improves the efficiency of resource allocation.

FDI-Growth nexus has both short run and long run element. In the short run, an outward-looking approach to government and factors which suit investment attract FDI. Furthermore, technological advancements that come along Foreign Direct Investment

have a permanent effect via infrastructural development and technological spillover in the destination country.

There are many factors that attract foreign capital in the form of Foreign Direct Investment. It is a unique form of financial flow that not only supplement domestic fund but also enhances the productivity aspect of the host country. A bunch of studies supports the positive impact of FDI on growth while a few other studies deny the connotation. Hence, the role of FDI towards economic growth is a debatable one.

1.3. Theoretical Background of Foreign Capital

Over the years, many theoretical developments in the field of international capital have taken place. International capital is broadly classified into Debt, Equity and FDI. Each form of foreign capital finances domestic investment (Razin et al. (1998)). FDI is a unique form of international capital because it alters ownership status of a firm.

N**eoclassical economic theory**: One of the foremost models of international capital is the neoclassical economic theory. Under the assumption of perfect factor mobility, capital flows towards relatively poor countries from relatively rich countries. This infers the importance of return on capital. "In reality, the existence of economies of scale, backward and forward linkages, systematic distortions and dissimilar regulations across countries are some of the reasons why neoclassical trade theory fails to predict the pattern of global capital movement (Sánchez-Martín et al., (2014).

Heckscher-Ohlin model: Heckscher-Ohlin model which is based on neoclassical approach is one of the earlier theoretical models of international capital. A country with

relatively capital abundance either will engage in export or set up production hub where the return on capital is higher and in the process factor price equalization is achieved. According to the neo-classical school of thought, capital flows from relatively rich countries to poor countries. The difference in human capital and external factors are the factors behind the failure of neo-classical approach as mentioned by Lucas (1990).

Ownership advantage as determinants of FDI: Earlier criticism of neo-classical approach was put forward by Hymer (1976) &Kindleberger (1969). They argue that perfect competition assumption of neoclassical theory failed to explain FDI. The monopolistic advantage is the reason behind the decision of a firm to enter the foreign market. They are of the view that firms need to enjoy ownership advantages like product differentiation, managerial expertise, patents and existence of economies of scale to compete with local firms. Numerical empirical studies have confirmed the fact that ownership advantages are significant determinants of FDI (Faeth, 2009).

OLI or eclectic approach: One of the most celebrated theoretical approaches is OLI or eclectic approach, developed by Dunning (1973, 1980). Three conditions to be full filled before a firm involves in investment decision (Dunning 1981). The approach of Dunning is popularly known as eclectic of OLI paradigm.

OLI framework provides the reason why companies produce away from home rather than exporting the product. The preference to produce away from home is due to three factors: Ownership advantage, Locational advantage and Internalization advantage. Firm chooses investment over export if firm enjoys certain advantage either of Ownership, Location or Internalization. Ownership advantages include the criteria that influence the companies to

invest abroad rather than exporting. Ownership advantages comprise factors like firm-specific assets, the patent as well as sophisticated management skills. Only if the certain advantage is ensured over local firm then firms tend to invest in the host country. Locational advantages are the host country-specific advantages. Internalization benefit is reaped if a firm saves cost of transportation. A common drawback of OLI as pointed out by Buch et al. (2001) is that the OLI framework fails to explain the reason behind the intra-industry investment.

Determinants of FDI in the OLI framework: MNE's enjoy Ownership advantages over domestic firms in the form of patents, advanced technological knowledge, management skill and reputation.

Locational advantages are the location attractions including protected markets, favorable tax treatments, lower costs (production & transportation) and lower risk. Internalization advantages are advantages that occur due to own production compared with licensing or exporting. It includes low transaction cost, less technology imitation and effective management. Dunning (1988) affirm that OLI advantages vary depending on the stage of development of a country, (i.e. developed or developing) large or small, industrialized or not. As per the OLI framework, the determinants of multinationals activity vary whether the focus is on Ownership, Location or Internalization advantages. Schneider and Frey (1985) find political instability as a significant variable affecting FDI inflows. Empirical work of Wheeler and Mody (1992) confirms that infrastructural quality is a significant variable for developing countries trying to attract FDI from the USA.

Policy variables as determinants of FDI: The contest may be between MNE and host govt. or between countries competing to attract FDI. Govt. policies influence the firms choice between production, licensing or FDI. The policy influence may not be only on investment decision but also on the type of investment. The decision, whether to involve in green-field FDI or to engage in the acquisition of existing firm is also influenced by policy variables.

There are many incentives that a country can offer to multinationals in order to attract FDI. Factors like market size, political stability and competition from other host government do play important roles in the bargaining process between the host country and multinationals. Haufler and Wooton (1999) point out the importance of the market size in attracting FDI. They analyzed policy competition between symmetric countries & analyze the significance of investment incentives offered by the host governments.

Multinational enterprises (MNEs) have emerged significantly in the process of global production and transfer of entrepreneurial skill. There are various studies that explain the reason why MNEs are a major source of FDI (Cooper (1968), Vernon (1971), Dunning (1979) & Greenaway (1993)). There are set of complex factors which drive FDI decision of multinationals. Another important point to make is that they do change over time.

The major motives of multinationals can be divided into three types.

1) **Market-oriented FDI.**
2) **Input-oriented FDI.**
3) **Cost-oriented FDI.**

The first motive is driven by the intention to invest in a market. The second motive is basically to get access to important factors of production. The third motive is to reduce the cost of production.

Countries may invest in countries with similar level of development or countries with lower production cost. The motive of investment in countries with similar level of development can be termed as trade substituting, whereas investment in countries with lower production cost can be termed as trade enhancing. The trade enhancing features of FDI is more important and the linkage with the exchange rate is likely to be different than the aspect of trade substituting. In cases where the motive of FDI is traded substituting the exchange rate of the home country at the time of investment only matter. However, if the motive of FDI is to export to third countries then host country exchange rate is important. FDI into the European Union is an instance of such type of investment. In cases where the motive of FDI is to reap the benefit of lower production cost, exchange rate linkage with the host country is crucial as NPV (Net Present Value) of investment directly changes with the exchange rate. The finding of Aizenman (1992) reveals that for a given volatility of shock fixed exchange rate regime tend to attract more Foreign Direct Investment vis-à-vis flexible exchange rate. Aizenman talks about two sources of volatility. One being the volatility of exchange rate and another is the volatility of shock. The approach of Aizenman works in the perfectly competitive framework.

Race to bottom policies: Country in recent decades has followed the "race to bottom" approach in order to attract more of foreign capital and hence policy variables also feature as an explanatory variable of FDI.

Risk diversification hypothesis: As per the risk diversification hypothesis, the motive of investment is to diversify production location so as to diversify risk; political and economic risk.

The principal theories of FDI can be categorized into two types. The first one describes FDI as a portfolio- allocation framework. As per this theory, FDI is largely influenced by the interest rate differential, profit or other measures of return to capital. This approach fails to explain why to invest in FDI rather than investing in equity or debt instrument.

The second one is about market imperfection as pointed out by Kindleberger (1969). Suitable conditions in the host country make FDI attractive. Hence, multinationals choose to operate in the host country rather than exporting.

1.4. Macroeconomic Uncertainty

The effect of uncertainty on investment is a matter of concern for policymakers. Theoretically, there are several channels through which investment is affected by uncertainty under certain assumptions about risk aversion, adjustment cost & other (Caballero (1991) & Abel and Eberly (1994)). The source of uncertainty may originate from macroeconomic variables like exchange rate, prices, interest rate and policy framework.

The channel of the effect of uncertainty can be either from demand and investment side or from the supply side.

Demand-side channels

People tend to save more if higher uncertainty persists in the economy. The decision to save more is basically due to the unexpected future labor income. As the view of Carrol

(1997) &Romer (1990), household keeps a better stock of saving so that they can withdraw money in the period of low income. People in general delay purchase decision of durable if they feel unemployment risk due to economic uncertainty. For the above-mentioned reasons, companies which face business uncertainty follow the "wait and watch" policy and in turn postpone investment. Postponement of investment depresses investment spending. Huge fixed cost is involved in new projects, so, companies choose the option of delaying until the uncertainty is resolved (Dixit and Pindyck (1994)). Demand uncertainty of a particular economy may force potential investors to invest elsewhere and as a consequence improves productivity growth (Disney et al. (2003).

Supply-side channels

Uncertainty affects the labor market if firms postpone the investment decision today that will adversely affect the supply in near future. Bloom (2009) points out that due to uncertainty firms delay the decision regarding hiring and firing. Uncertainty likely to make workers less willing to look for new jobs and in turn reduces the churn in the labor market. As a result, it leads to having an impact on productivity growth through inefficient matching of skills and jobs (Edward et al. (2012)).

Real options approach

Real options approach rests on the principle of Dixit and Pindyck (1994) who throw light on the effect of uncertainty on investment. Exchange rate uncertainty influences the decision whether to invest now or later or not investing at all. Investors may follow an option of not investing if exchange rate uncertainty persists in the economy. Exchange rate uncertainty influence the timing of investment and the investors choose whether to invest or wait for the time being.

Risk aversion approach

Risk aversion approach explains the exchange rate risk which arises due to the difference in timing between investment decision and profit generation. Time lag involves in investment and profit. The investment decision is based on the future expected return which alters due to exchange rate volatility.

There exists a difference between volatility and uncertainty. Variability signifies risk whereas uncertainty means an unexpected change in an economic variable. In most of the empirical cases, the terms are used interchangeably. Theoretically, difference prevails between uncertainty and volatility. However, both terms have been used interchangeably in the study.

1.4.1. Competing Theories of Macroeconomic Uncertainty

The debate, why to produce away from home rather than exporting has been the focus of many empirical investigations over the past three decades (Dunning, 2009). Though the factors: availability of natural resources, infrastructural facilities, investment incentives and government restrictions are important factors behind location decisions but macroeconomic and macro-organizational policies have gained importance during 1990's. Macroeconomic factors must be analyzed in order to explain FDI trend (Vasconcellos and Kish (1998)).

Dixit and Pindyck (1994, 1995), Pindyck (1998), Campa (1993) &Rivoli and Salorio (1996) claim that the changing value of real-options due to the business uncertainty of financial market is the driving force behind FDI. MNE's can withhold FDI decision if exchange rate uncertainty rises. Exchange rate volatility which leads to uncertain return

increases the value of delayed FDI decision. Dixit-Pindyck's option theory suggests that the effect of exchange rate volatility on FDI would be negative. Economic uncertainty plays a major role in describing the factors that deter capital inflow. In contrast, pricing to the market hypothesis of Devereux and Engel's (2001) and hedging hypothesis of Itagaki (1981) suggest that there would be a positive influence of exchange rate volatility on FDI.Itagaki (1981) suggests that MNE's invest as a way of hedging when exchange rate volatility increases.

1.5. The scope of the Study

There is no particular single economic model that can take care of all the complex nature of FDI.The determinants of FDI should be derived from various theoretical models rather than from any specific theory (Faeth, 2009). The progress of globalization over the years has led to increased multinationals activity and Foreign Direct Investment. FDI theory which is a part of more general capital movement theory is based on a trade theory perspective. FDI determinants can be macroeconomic factors, microeconomic factors or a combination of both (Faeth, 2009).

Studies that incorporate the response of investor regarding investment decision are Robinson(1961),Behrman(1962),Basi(1966),Kolde(1968),Wilkins(1970)&Forsyth(1972) etc. These studies analyze different factors like marketing, trade restriction, costs barriers and investment climate.

Despite a range of factors that affect investment decision, Locational factors of the host country have been the most important aspects and also the central theme of many empirical works over the years. The empirical relation between uncertainty and

investment is influenced by the exclusion of certain important variables. Another problem relating to different cross-country study is that it is likely to face the problem of heterogeneity bias if several cross-country cross-section data are included in the study.

The reason for the misleading effect of FDI with respect to economic variables is attributed to the inappropriate pooling of Less Developed countries (LDCs) and Developed Countries (DCs) (Blonigen and Wang, 2004).That's why countries with developing nature feature in the study.The classification of countries is based on the United Nations Conference on Trade and Development (UNCTAD). Altogether 28 developing countries are included in the empirical analysis. FDI inflow in terms of millions of USD into these 28 developing economies is more than 30% of FDI inflow into developing economies during 1997-2014. The selection of time period is basically due to the emergence of World Trade Organization (WTO). Artificial trade restriction has reduced due to the emergence of WTO, an international trade regulator. WTO has made world economy less restrictive in terms of movement of factors of production.

There has been a phenomenal change in the FDI flow towards developing economies. For this purpose, FDI inflow to the developing countries with respect to the developed countries and the world are analyzed. For a better understanding of FDI position, FDI share out of the world's total inflow is also examined.

The study also tries to measure macroeconomic uncertainty by means of measuring the conditional variance of percentage change of REER index. Autoregressive conditional heteroscedasticity (ARCH) family models are used to measure the conditional variance.

At last, the analysis tries to find out the impact of macroeconomic uncertainty along with other macroeconomic variables on FDI inflow towards developing countries. The empirical examination is carried out with the help panel data technique.

1.6. Objectives of the Study

The main objectives of the study are as follows:

1) To analyze FDI inflow towards developing countries in comparison to developed countries and total FDI inflow of the world.

2) To Measure macroeconomic uncertainty.

3) To empirically investigate the effect of macroeconomic uncertainty and other variables on FDI inflow in developing countries.

The above objectives have been framed on the basis of different theoretical frameworks which can be analyzed with macro-level data. One of the major contributions of this study is that it covers the data period in which developing countries have received significant amount of Foreign Direct Investment.

1.7. Data and Methodology

Analysis of the First objective is based on annual data spanning from 1990 to 2014. Classification of countries into developing and developed is based on the United Nations Conference on Trade and Development (UNCTAD). Annual data is extracted from the United Nations Conference on Trade and Development (UNCTAD) database. First of

all, FDI inflow in terms of millions of USD is reported. For a better understanding FDI index is calculated with the base year of 2010. This is done so as to get the clear idea about FDI inflow with respect to a particular year. The Trend of the Foreign Direct Investment (FDI) inflow is elaborately discussed. In the same objective, FDI inflow share to developing country out of world's total FDI inflow is also discussed. Further, geographical classification of developing countries and FDI inflow to the respective continent is also shown.

For the second objective, 28 developing countries are taken into consideration. Developing Countries are Algeria, The Bahamas, Bahrain, Bangladesh, Bolivia, Brazil, Burkina Faso, Cambodia, Costa Rica, Guatemala, Honduras, India, Jordan, Kuwait, Laos, Malaysia, Mauritania, Mongolia, Niger, Nigeria, Pakistan, Paraguay, The Philippines, Saudi Arabia, Singapore, Togo, Trinidad and Tobago&Turkey.

These countries are considered because of the developing nature of the economy irrespective of the geographical location and continent. Monthly data is from 1996M1 to 2013 M12. Percentage change of the real effective exchange rate (REER) index is calculated before proceeding for conditional volatility measurement. Augmented Dickey-Fuller (ADF) test is used to verify the stationary property of change of REER index. ADF test confirms the stationarity of each exchange rate change series. Data for REER index is obtained from Bruegel data set. Monthly data is taken into consideration for a large number of observations. Different ARMA specification is used for modeling the mean equation. ARCH-family model is used to model the uncertainty. After estimating monthly conditional variance series for each country they are averaged to get yearly series. Exchange rate change of most of the countries followed GARCH (1,1) process.

However, A few countries followed the different ARCH specification. Since the exchange rate is the most important factor in any cross country transaction, exchange rate uncertainty is taken as the proxy for macroeconomic uncertainty in the host country.

The third objective investigates the effect of macroeconomic uncertainty and other explanatory variables on FDI flow. The research analysis tries to find out the presence of threshold effects in the balanced panel data set up and investigates the effect of macroeconomic uncertainty and other explanatory variables on FDI flow.There may be some threshold level of income after which developing countries are more attractive in relation to its counterpart and hence the concept of the threshold is incorporated into the research work. FDI decision takes time and hence one year lag of explanatory variables is taken into consideration. Methodologically, the study employs "pdR" package in "R" software which is the extension of non-dynamic panel estimation of Bruce E. Hansen.

1.8. Organization of the Study

The present chapter provides an overview the importance of foreign capital with a special focus on the importance of Foreign Direct Investment. In addition, the importance of FDI in the context of developing countries is also discussed. Various theoretical backgrounds are also dealt in detail.

Chapter 2 briefly analyzes literature of earlier study. Earlier studies are broadly categorized into studies related to macroeconomic variables and study related to the uncertainty and FDI.

Chapter 3 analyzes the trends and Prospects of Foreign Direct Investment towards developing countries.

Chapter 4 measures the macroeconomic uncertainty and subsequently analyzes its impact on Foreign Direct Investment. Results from non-dynamic panel estimation are also presented.

Chapter 5 summarizes the empirical finding followed by discussion.

Chapter-2

Review of Literature

The review of earlier literature is categorized into following:

1) Research Work Related to Macroeconomic Variables and its Impact on Foreign Direct Investment.

2) Research Work Related to Macroeconomic Uncertainty and FDI.

2.1. Research Work Related to Macroeconomic Variables and its Impact on Foreign Direct Investment.

Xing (2006) in his seminal work has concluded the very fact that real exchange rate is one of the significant variable determining the FDI in Chinese manufacturing sectors from 1981 to 2002.

Klein and Rosengren (1994) find a significant correlation between FDI towards the USA and its real exchange rate. His study proofs a point for seven industrial countries and the period spanning 1979-1991. Their work also points out that the relative wage does not have a significant impact on the determinants of United States' FDI.

Baek and Okawa (2001) investigate the appreciation of yen against the Asian currencies and the US dollar significantly increases Japanese FDI in Asia. Their analysis on sectoral aspect concludes the fact that labor productivity differential has a major impact on FDI, but the direction of the effect varies across sectors. High wage rate and import tariff rate in the host country negatively affect Japanese FDI in Asia.

Xing and Zhao (2008) explore the linkages among reverse import, FDI and exchange rate. Their study reveals the finding that yen appreciation influences the rise of Japanese production in China and consequently reverse import and a fall in Japanese production at home. Devaluation of Chinese Yuan results in export-led growth in China, they pointed out.

Froot and Stein (1991) link the relationship between exchange rate and FDI subject to the informational imperfections. Imperfection makes external finance dearer than internal finance. They conclude a systematic effect of exchange rate on FDI. Any shock to wealth effect also plays an important role in improving the FDI inflow. Wealth effect contributes significantly to improving the FDI.

Goh et al. (2013) summarize the relationship between trade and FDI flow in both directions i.e. inward as well as outward. They took the sample of Malaysian economy for finding out the economic linkages. They conclude a significant relationship between inward FDI and trade, however, trade linkage and Outward Foreign Direct Investment (OFDI) are not robust in Malaysian case which they take as the sample. Inward FDI significantly affects both export from and import to Malaysian economy, but OFDI has negligible linkage on both export and import.

Kinoshita (2011) mentions that a comparatively higher investment in the financial sector, in activities of untradeable goods and services production may stimulate the internal demand and imports with a negative impact on current account deficit and external debt.

Kolstad and Villanger (2008) make an attempt to find out the potential determinants of Foreign Direct Investment in services by taking the sample of 57 countries and find that the domestic market size affects positively to service sector FDI, whereas Trade openness does not. Democracy is found to be significant in explaining in FDI flow towards developing economies in line with the finding of Harms and Ursprung (2002). They also uncover the evidence of a strong correlation between FDI in producer Service and FDI in manufacturing which is consistent with the belief that service industries are vertically disintegrated with the production chains. The authors also find the linkage of GDP per capita and institutional quality on business FDI.

Demekas et al. (2007) point out the importance of policy along with the gravity model variables and show how it plays a major role in determining the FDI flow towards a country. Macroeconomic stability of the country promotes a better environment for FDI and as a result, it acts as an incentive for the foreign investment. The benefit often outweighs the cost which is in the form of transfer pricing. By analyzing bilateral FDI data between 16 host and 24 source countries, the authors find a non-linear relationship between FDI and its explanatory variable conditioned to income threshold effects. The authors' result clearly suggests the factors which gain importance at a higher level of income. Market size gains importance while cultural distance variable turns insignificant at higher level income. Their finding is consistent with the hypothesis that as the income level of a country grows the nature of FDI will shift from vertical to horizontal. Factors like corporate tax burden, high unit labor cost and high-level import tariff deter non-privatization related FDI. Major policy determinants of FDI change as the income level of host country changes.

Wyk and Lal (2008) find that the political-economic freedom facilitates higher FDI flow in developing countries. Trade liberalization accompanied by the free market tendency have resulted in business opportunities. Political risk in host country adversely affects the firm's profitability as well as firm's profit expectation. There is a tradeoff between operation risk and FDI inflow, as operation risk acts as a hindrance in the smooth capital flow process. High inflation hinders FDI inflow. High inflation makes the long-term capital investment costlier, as inflation makes the product relatively costlier in the world market and as a consequence, the product loses its competitiveness in the international market. Their analysis also finds the fact that the initial market size has more impact on the FDI inflow vis-à-vis rate of GDP growth. The High political risk is negatively associated with FDI flow whereas the coefficient of economic freedom is positive. Economic freedom is relatively more important than political freedom with respect to attracting foreign capital flow. Sound economic performance of countries will attract a significant amount of foreign capital. By estimating panel regression for 31 developing countries for the annual time series data 1995-2003, the authors confirm the importance of macroeconomic factors like Gross Domestic Product (GDP), Per Capita Income (PCI), exchange rate, Consumer Price Index (CPI), and current account balance. These macroeconomic variables are statistically significant in explaining capital flow towards host countries. The result exhibits that the depreciation of currency of host country results in lower FDI inflow. This is persistent with the result of high degree correlation between CPI and exchange rate.

Frenkel et al. (2004) make use of Panel data approach and consider both host and home country factors which play important role in deciding both the amount of capital flow as

well as the destination of foreign capital. The authors result discloses the fact that GDP growth in the host country positively influences the FDI flow. Openness in the host country also positively affects the inward flow of FDI. To incorporate the risk factors into the model specification, authors have made use of the Euromoney country risk rating, which combines political and economic risk is found to be negatively statistically significant. Home GDP growth is found to be positive and significant in explaining FDI inflow from home to host country. Business cycle of the home country also matters on the decision to invest fund away from home country.

Asiedu (2002) assess the importance of return on capital along with other determinants that explain capital flow towards different economies. Return on capital is measured as the inverse of the per capita real GDP. This basically implies that other things being equal countries with lower per capita income will yield a higher return and vice versa. The basic argument behind the notion is that investment risk rises due to the decline in per capita GDP. As a result, investors may need higher returns to compensate the perceived greater risk. This argument favors the aspect how a higher level of GDP is a better prospect for FDI in the destination country. This argument is valid in the line of Market-seeking FDI. Political risk variable is found to be insignificant in describing capital inflow. Higher return on capital is phenomenal to explain the FDI to non-Sub-Saharan Africa (SSA) countries, but has no such impact on FDI flows to SSA countries because of low risk-adjusted return. Openness is statistically significant and positive to both SSA and non-SSA regions. Infrastructural development has a positive impact on FDI in non-SSA countries.

Ang (2008), using the time series data of annual frequency from 1960-2005 studies major variables which explain the variation in inward FDI in the case of Malaysia. Private credit upon GDP which is a measure of financial development is statistically significant and positive which is consistent with the result of Deichmann et al. (2003). Financial development facilitates the use of advanced and modern technology in the host economy. This mechanism affects the pace of technological innovation and subsequently induces spillover efficiency. The author finds highly significant and positive influence of real GDP on inward FDI. The rationale behind is that due to the better market potential a firm reaps the benefit of economies of scale. This finding coincides with the finding of Wang and Swain (1995), Chakrabarti (2001) & Ramirez (2006).

The effect of market size and GDP growth on inward FDI is found to be positive and statistically significant. Infrastructural development of Malaysia is positive in attracting inward flow of capital towards its territory. In the line with the finding of many other empirical works, the author finds a positive link between openness and FDI. Hence, greater liberalization of trade sector is phenomenal in attracting larger quantum of capital into the economy. Better financial development is positively linked with increased FDI; same with the finding of Deichmann et al. (2003). Depreciation of currency is associated with the greater FDI inflows are also confirmed by the author's analysis. However, a rise in corporation tax deters capital inflow towards the country. FDI inflow is negatively associated with the higher rate of Corporation tax.

Villaverde and Maza (2015) find that FDI shows a high level of concentration in the European Union (EU) region. The regions are concentrated around more or less level of inward FDI. Inward FDI of a particular region is linked to that of its neighbors. Labor

regulation is significant in explaining inward capital flow. Labor market characteristic and technological progress also influence FDI location.

Busse and Hefeker (2007) assess the linkages among institution, political risk and Foreign Direct inflows. The sample comprises 83 developing countries and the annual time series data ranges from 1984 to 2003. There are various determinants that influence the decision of location of investment. However, the authors give emphasize on the political risk factor as a potential determinant of FDI. Political risk is the risk related to the condition of sovereign host govt. which unexpectedly changes. This is the change of "the rule of the game" under which business operates (Butler and Joaquin, 1998). The authors have made use of econometrics technique like a country fixed effects model and GMM technique developed by Arellano and Bond. To capture the political risk of the concerned country the authors have taken the ICRG (International Country Risk Guide) provided by the Political Risk Services (PRS) group. PRS group provides information on 12 different risk indicators and the indicators are associated with both political risk and political institution. GNI per capita is strongly associated with the indicators of political risk, confirming the fact that poorer countries have more political risk than the richer ones. Better multinationals are also quite common in rich countries than poor countries. Lag FDI and economic growth are found to be positive and statistically significant. Inflation which serves as a proxy for the macroeconomic imbalance is found to be not significant. Democratic rights do matter for multinationals to operate in developing countries and positively link with FDI inflow which is consistent with the finding of Harms and Ursprung (2002), Jensen (2003) &Busse (2004).

Taking Cambodia as the sample country, Cuyvers et al. (2011) find larger market size at home tends to expand FDI flows towards Cambodian economy. The argument for this is that larger country likely to have more number of firms and those firms expand its business into the international market. It is confirmed that investment flows away from larger economies. The authors have used one year lag of variables for the econometric estimation. Other factors like growth rate, relative interest rate, inflation, trade and Asian financial crisis are found to be statistically insignificant in approved FDI case. The exchange rate is found to be positively influencing the FDI flows towards Cambodian economy. Relative depreciation of host's currency vis-à-vis the home country currency make the country cost-advantageous and in turn, reduces the cost of production. Decrease in cost due to exchange rate variation provides an incentive for investors to increase investment flow towards the concerned host country. The Decrease in political risk positively influences inward FDI is confirmed by authors' analysis. Explanatory variables of both approved and realized FDI are almost consistent in Cambodian case. In realized FDI case trade is positive and statistically significant at one percent level. The argument behind this is that more trade linkage between the home and the host tend to positively influence FDI flows towards Cambodia.

Bekhet and Al-Smadi (2015) analyze both short run and long run association among FDI and its determinants in Jordanian case. Authors rely on Autoregressive Distributed Lag (ARDL) technique for short run and long-run relationship while Granger causality test is employed to find out the direction of causality. The result shows the significant relationship among FDI, economic growth and financial development in Jordan. By assessing the long- run relationship among FDI and its determinants and also the

direction of causality for the annual time series of 1978-2012, authors find the long- run relationship among variables and also the long- run causality running from regressor to FDI.

In the long-run, one year lag of CPI is negatively associated with FDI. Rise in price leads to decline in FDI flow as the internal economic position of a country is often reflected with inflation figure. CPI figure reflects both fiscal and monetary policy and also the coordination among those policies. The long-run result also indicates the significant relationship among GDP, Economic Openness (EO), M2, and SMI and FDI in Jordanian economy.

Using JJ test for FDI, GDP, Unit Labor Cost (ULC) and share of import duty on tax revenue Chakraborty and Basu (2002) identify two co-integrating vectors i.e. FDI and GDP. They employ aVector Error Correction Model(VECM) framework to find out short-run and the long-run dynamic relation between the two. Trade liberalization initiative of Government of India is found to have a short run positive influence on FDI. Result reveals unidirectional causality which runs from Gross Domestic Product (GDP) to Foreign Direct Investment (FDI). Additionally, VECM result shows a fall in labor cost per unit due to the rise of FDI inflow on the line with the argument that FDI displaces labor. For the empirical analysis annual time series spanning from 1974 to 1996 is employed. Liberalization of Indian economy did play a significant role in magnetizing foreign capital towards its territory.

Influence of macroeconomic factors on FDI in Norway for the period of 1986-2009 is explored in a study by Boateng et al. (2015). Relying on the quarterly time series data from 1986 to 2008, Boateng et al. (2015) find a significant influence of macroeconomic

variables on inward FDI flow. Variables like money supply, interest rate and unemployment are found to have a negative influence on FDI. In the long run, Real Gross Domestic Product, sectoral production, trade openness and exchange rate positively influence FDI inflow is confirmed by Fully Modified Ordinary Least Square (FMOLS) result. Exchange rate as measured by the change in Real Effective Exchange Rate (REER) is found to be a positive determinant of FDI inflow. This signifies the fact that appreciation of Norwegian Krone (NOK) results in the rise of FDI inflow towards Norway. The positive link between currency appreciation and the rise of FDI flow is contrary to the general belief that depreciation of the currency is instrumental in making a country a preferred investment destination. To sum up, factors like Real GDP, trade openness, and exchange rate significantly influence FDI flow.

Fung et al. (2002) find that GDP level to have a positive & significant impact on FDI inflows. Study of Wheeler and Mody (1992) confirm that factors like industrial growth and expanding domestic market are paramount for developing countries.

Billington (1999) argues that high GDP, as well as economic growth, positively influence FDI inflows.

In an analysis for FDI into Latin America, Addison and Heshmati (2003) find openness to trade as a significant variable. Studies of Nonnemberg and Mendonça(2004), Akhter (1993), Al Nasser (2007) and Torrisi et al. (2008) find the fact that trade openness positively affects FDI.

Ramcharran (2000) explores that the regulatory and risk reduction factor positively contributes to FDI. However, factors like legal environment and country risk negatively

influence FDI flow. Work of Naudé and Krugell (2007) confirms the importance of legal system and political stability in influencing FDI.

Akhter (1993) is of the view that political instability is negatively associated with business activity & hence significantly affects FDI.

Ahlquist (2006) makes an attempt to analyze the impact of economic policy on capital inflows. The author tries to make a comparative analysis of two distinct form of capital inflow i.e. portfolio and Foreign Direct Investment. The finding shows that portfolio investors are more sensitive to macro-level policy outcome in comparison with Foreign Direct Investors. Different types of investment respond differently with the change in the macro-level policy variable. Relative to portfolio investment, FDI is found to be more sensitive to the political institution. The author makes use of between-country and within-country panel model to conclude the inferences. Countries which have the earlier history of default tend to receive less of portfolio investor perception. However, as time passes the impact of default dries out.

Countries with default history find it tough to borrow from the international market. Some consider foreign capital in the form portfolio investment as the precondition for overall development and some other consider as a form of speculative investment. GDP per capita, better political institution, and credit ratings possibly influence FDI.

Studies of Bajo-Rubia and Sosvilla-Rivero (1994), Moore (1993) & Wang and Swain (1995) find real GDP as a significant determinant of FDI. Some alternate measures like the rate of growth of real GDP are found to be statistically significant by Wang and Swain. Studies of Schneider and Frey (1985) include GDP per capita as the measure of market size. The growth rate of GDP can be viewed as a proxy to measure the domestic

market size of the host country. However, per capita GDP level may be used to measure the economic development of the host country. Countries with the characteristics of higher per capita income tend to attract more FDI.

Blonigen and Wang (2004) observe that the flow of FDI is mainly among Developed Countries (DCs). However, the flow towards the Less Developed Countries (LDCs) is on the rise. There are theoretical models which describe the motive of multinationals to operate in lower cost countries.

Blomström and Kokko (1996) make an attempt to find out the effect of FDI on host country with the special focus on the transfer and diffusion of technology. The authors provide a tentative conclusion by reviewing several research articles. The tentative inference is that FDI may promote productivity growth and exports in the destination country.

Kinuthia and Murshed (2015) examine the determinants of FDI in Kenya and Malaysia and its role in economic growth. Malaysia success story behind huge FDI inflow vis-à-vis Kenya is due to the stable macroeconomic scenario, better trade policy and institutional and infrastructural factors. Results show, in Kenya FDI and GNI (Gross National Income) are co-integrated. In the case of Malaysia three co-integrating vector that is FDI, GNI and wages are identified.

In the case of Kenya, lower wage attracts FDI in both short run and long run is confirmed in Kenyan case in the line with the finding of Bellak et al. (2008) &Lall et al. (2003). Exchange rate depreciation and improved democracy also positively influences FDI. In the case of Malaysia, the result shows a negative relationship between higher wages and FDI. Also, the coefficient of trade openness is negative. On the other hand, exchange rate

depreciation positively influences Foreign Direct Investment. In the long run, the finding shows a negative relationship between financial depth and FDI.

2.2. Research Work Related to macroeconomic Uncertainty and FDI

It is hard to predict the exact time of instability. However, it may be practically possible to determine the scale and factors behind instability. It is possible to ascertain the factors behind the instability and also the influence of instability on other factors. Economic outcomes depend on how people behave to uncertainty. The perception of past, present and future affect the behavior of people or investor. One of the foremost studies of uncertainty was done way back in 1921 by Frank Knight. He made a clear-cut distinction between risk and uncertainty.

Keynes (1936) was of the view about the pervasive nature of uncertainty in his business cycle analysis. According to him, it is basically due to subjective probability. Many a time occasional significant change in expectation adversely affects the business confidence around the globe. The perceptions of one about the uncertainty affect the perception of others. Sometimes the perceptions not only transmit at a greater pace but also get magnified as pointed out by Cabellero and Krishnamurthy (2008). They analyze how liquidity shocks under Knightian uncertainty result hoarding of the liquid asset by the investor. This kind of situation is experienced due to the common perception of all firms regarding credit crunch situation. If all firms believe that there is a shortage of liquidity, ultimately it will hoard the liquidity to avoid liquidity crisis in case the information is dispersed.

There are different channels through which uncertainty influence investment. Some channels may operate in different directions. To make a detailed analysis of the influence of macroeconomic uncertainty on private investment, Servén (1998)employs panel data technique comprising the data of developing countries. The key macroeconomic variables of the study are inflation, output growth, the price of capital goods, terms of trade, and real exchange rate. The first three variables are associated with the profitability of capital. The author verifies the association of macroeconomic variables with aggregate private investment. Different volatility measures of economic variables are found to be negatively linked with investment ratios. Real exchange rate volatility is found to be invariably negatively linked with investment irrespective of the econometric specification. The author explores the effect of uncertainty on investment by studying the data of 94 developing countries for the time period of 1970 to 1995.The volatility of inflation is used for measuring overall macroeconomic uncertainty. The volatility of output growth is taken into consideration in order to measure unpredictability of demand. The author constructs different measures of uncertainty of five macroeconomic variables and analyzes the relationship between private investment. Apart from macroeconomic variables the author also includes other relevant variables in the study. Index of macroeconomic variables is found to be negatively linked with private investment.

Crowley and Lee (2003) analyze FDI (both inward and outward) between the USA and each of 18 OECD countries. The 18 countries are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, Korea, Mexico, The Netherlands, New Zealand, Portugal, Spain, Sweden, and the United Kingdom. Quarterly data from 1980 to 1998 are obtained for the empirical analysis. The authors make use of both time series

and panel data technique. Exchange rate volatility of each OECD country is measured by GARCH (1,1) process. The finding provides weak support regarding the negative linkage between exchange rate volatility and capital flows. The linkage between volatility and investment vary from country to country. The authors consider bilateral data on FDI inflows and exchange rate between USA and OECD countries. Authors use conditional volatility measures rather than unconditional volatility like moving standard deviations (Darby et al. (1999) & Rapp and Reddy (2000).

The effect of exchange rate level and uncertainty on the FDI inflow is tested by the Amuedo-Dorantes and Pozo (2001). The study period ranges from 1976 to 1998. Authors find exchange rate uncertainty to be negatively linked with FDI. The superiority of study lies in the use of conditional measures of exchange rate uncertainty instead of unconditional measures. Other important variables apart from exchange rate uncertainty are also taken into consideration. The main focus of the study was to ascertain the impact of exchange rate level and exchange rate uncertainty.

Lemi and Asefa (2001**)** analyze the impact of price, exchange rate uncertainty and political instability on inward Foreign Direct Investment towards African countries. Fixed effects model is found to be a better model than the pooled model in explaining inward FDI to African economies. Inflation and real exchange rate uncertainty are measured by conditional variance. ARCH (GARCH) model is used to measure the conditional variance of inflation and exchange rate. Conditional variance is calculated on the monthly inflation and exchange rate and then averaged annually to form annual data series. Inflation and political instability deter the flow of FDI when they are combined and cross some threshold level. The volatility of real exchange rate deters FDI inflow

when its amplitude is low. The authors have tried different model specifications to ascertain the effect of economic and political variables on inward FDI. Conditional variance of inflation which is measured by ARCH (GARCH) is found to be positive in cases it is significant. The argument for this is that conditional variance of inflation captures shift. This very aspect is also pointed out by Lucas and Prescott (1971).The interaction between economic and political uncertainty is found to be negatively linked with FDI inflow. Inflation uncertainty and political instability were used to measure economic uncertainty and political instability respectively. In the linear specification, exchange rate uncertainty deters FDI inflow. However, non-linear exchange rate term is found to be positive.

Renani and Mirfatah (2012) have investigated the determinants of inward FDI, especially volatility of exchange rate and suggest better measures for attracting FDI in Iran. Their work concludes that GDP, trade openness and exchange rate to have a positive relationship with FDI, but the volatility of exchange rate and world crude oil prices negatively affect the FDI.

Takagi and Shi (2011) critically survey the link between exchange rate movements on the quantum of FDI. Their study focuses on the Japanese outward FDI flow to dynamic Asian economies. Depreciation of exchange rate impacts positively to the inward FDI movement, however, exchange rate volatility discourages FDI inflow. Since the data period covers the Asian crisis, they examined the effect of the Asian crisis on currency inflow if any using the dummy variable technique. They conclude no effect of the Asian crisis on FDI. Exchange rate levels as well as volatility have a robust impact in determining the FDI. Higher third movement of yen causes the decline of FDI outflow

from Japan concluding the fact that investors are careful about the future stream of return denominated in the home currency.

Bozozowski (2003) clearly shows the relevance of the size of the host country and the previous level of FDI in affecting the FDI inflow. However, the result finds no evidence of the effect of exchange rate uncertainty on FDI inflow.

Udoh and Egwaikhide(2008) by investigating the time period between 1970 and 2005 in the case of Nigeria find a negative impact of exchange rate volatility and inflation uncertainty on Foreign Direct Investment. Both exchange rate volatility and inflation uncertainty were estimated with the help of GARCH variance equation. So as to make the host country more attractive for foreign investment, policymakers often commit to reduce macroeconomic uncertainty so as to reduce the risk of economic agents.

Oluseye (2010) concentrates on the factors like policy uncertainty and macroeconomic environment and its bearing on FDI inflow in the case of Nigeria by employing time series data from 1970 to 2010. The study also includes factors like govt. policy, investor's confidence, domestic market size, size of the export sector and cost of capital and tries to analyze the influence on inward FDI. The author finds the negative influence of exchange rate variability on Inward Foreign Direct Investment (IFDI). Lag exchange rate variability and inflation variability are also found to be statistically significant and deter IFDI.

Solomon and Ruiz (2012) by analyzing the data of 28 developing countries from 1985 to 2004 incorporate various macroeconomic variables and political risk variable that influence capital flow. The effect of inflation on inward FDI is found to be statistically

significant and negative, signifying the fact that high inflation is a signal for economic instability or the failure of monetary policy. High inflation also adds the uncertainty to the net present value of the investment. Openness is found to be positive and significant in explaining the inward FDI. Exchange rate uncertainties, measured by the GARCH variance equation and political risk have a negative bearing on the capital flow. One year lag FDI is also found to be positively significant in describing the present FDI flow.

Arbeláez and Ruiz (2013) by analyzing the research question of FDI flow towards Latin America with the help of GLS technique find no influence of openness and inflation on FDI. Alternatively, the GDP growth coefficient of the home country, USA, is positive and significant which implies that the increase in income of the USA results in increasing the FDI flows into Latin American countries. An outcome in which FDI flows towards relatively less wealthy countries which are consistent if the investments are vertical in nature that is resource seeking. Exchange rate uncertainty which is measured by GARCH(1,1) process is found to be negative and statistically significant which reveals a negative link between real exchange rate uncertainty and FDI flows, consistent with the finding of Amuedo-Dorantes and Pozo (2001) &Brzozowski (2006). The effect of exchange rate level on FDI is found to be statistically insignificant.

Sánchez-Martín et al. (2014) analyze the important determinants of Foreign Direct Investment in Latin America. The period of study is from 1990 to 2010. This study also incorporates the "Risk management" factor as a potential determinant of inward FDI (institutional risk perceived by foreign investors, closely related to the political economy of the country). Many a time political- economy factors play a major role as govt. stability has to bear on the long-term perspective of a firm. The important aspect of the

article includes the determinants of macroeconomic management, institutional development, and trade agreement. The higher propensity of foreign investment is also found in countries with the sound legal framework. This is consistent with the argument that countries with better institutional framework have been able to attract a greater share of FDI. FDI stock is found to be positively influencing IFDI flow, revealing the fact that potential investors are more interested in countries with greater existing investment. GDP per capita growth is found to have no influence on IFDI. The study also finds a negatively significant influence of current account balance which implies the fact that countries with the financial deficiency will try to attract stable capital in the form of Foreign Direct Investment. Inflation, exchange rate volatility, trade agreement and the nominal interest rate is found to be statistically insignificant. Trade openness, as measured by trade percentage to GDP, is positive and significant. Government stability is also found to be positive and statistically significant.

Haddow et al. (2013)focus on the construction of aggregate economic uncertainty indicator and its influence on different. Adverse shock in an economy results in more uncertainty about the economic climate. Due to the uncertainty, economic agents are not sure of the future economic environment. Economic indicators such as spending pattern, investment decision and asset price get affected due to the unpredictable economic environment that prevails in the economy. Uncertainty affects the economy depending on the source of uncertainty. People make use of economic information around them so as to make the sensible economic decision. In general, people not only assess the current economic prospect but also keep vigil look on the expected economic scenario of concerned economies. Different economic agents take a decision on different aspects,

depending on the judgment they have to make. Households decide on the payment they make, companies evaluate the future potential demand before making any investment decision.

Arratibel et al.(2011) analyze the impact of exchange rate volatility on different macroeconomic performances such as output growth, excess credit, FDI and Current Account Balance.Fixed effects estimator confirms the negative influence of exchange rate volatility on both Foreign Direct Investment (FDI) flow and stock. Panel data estimation for the period of 1995-2008 indicates that lower exchange rate volatility is associated with better growth performance, higher FDI and higher CAD. Exchange rate volatility is found to be negatively linked with excess credit, which is the deviation from long-term equilibrium. Higher exchange rate volatility decreases excess credit.

Pennings and Sleuwaegen (2004) derive a profit level after which multinational chooses to own a subsidiary rather than export. In other words, authors analyze the profit level at which investors choose FDI to export. The factors that influence entry mode are uncertainty about future profits, tax differentiation between the home and the host, institutional setup and corporation between partners in a joint venture.

Lee and Min (2011) analyze the role of exchange rate and exchange rate volatility as determinants of FDI in South Korea. They hypothesize that depreciation of exchange rate may have contributed to the greater inflow of FDI towards South Korea, but the driving force before and after Asian financial crisis may be different. They confirmed a non-linear relationship between exchange rate uncertainty and FDI. The non-linear relationship between uncertainty and investment is also the finding of Sarkar (2000).

Goldberg (1993) analyzes the impact of the real exchange rate, exchange rate volatility, real GDP and the interest rate on United States' sectoral investment. The real exchange rate is found to have no statistical significance on investment for the whole economy. However, the significant impact is seen for the manufactured and non-manufactured sector.

The economic analysis of Yang et al. (2000) finds out determinants of aggregate FDI into Australia. Variables like interest rates, change of wages and openness of the economy are the major determinants of FDI. The total of imports and exports as a percentage of GDP is used by the authors to measure trade openness. The stability of the domestic macroeconomic environment was measured by inflation (percentage change in the consumer price index).

The interest rate is found to be positively influencing FDI. The degree of openness is found to be negative and statistically significant in describing FDI towards Australia. As per this finding, FDI is also negatively influenced by high inflation.

In an analysis of 19 Latin American and Asian countries, Al Nasser (2007) finds macroeconomic stability as one of the variables that affect FDI inflow. Aizenman and Marion(1995) find a negative relationship between economic instability and private investment.

Serven and Solimano (1993) made use of panel data technique to ascertain the linkage among different measures of variability and investment. The standard deviation of inflation and real exchange rate were used to measure the variability. These variability measures were found to affect investment negatively.

Nnadozie (2000) studied US direct investment in 22 African economies. The lag of inflation and political risk indicators are used as the measure for uncertainty indicator. Uncertainty measures are found to be statistically significant. The focus of the author was on the role of economic uncertainty, political instability, labor market size, previous level of FDI and export.

2.3. Concluding Remarks

In the review of literature, both theoretical as well as empirical studies are analyzed.The nature of FDI is still unanswered due to various reasons. The reasons are the nature of data, country differences or due to less time series observation.

There are various factors that tend to attract FDI into an economy. Many studies concentrate on the factors that drive FDI into an economy. However, Factors related to disfavor or undesired situation in the host also have an impact on the degree and dimension of international capital flow, in the form of FDI. Study of Dunning (2009) pointed out lack of research attention on the macroeconomic factors of the host country. The aim of the work is to access the importance of macroeconomic factors which significantly influence FDI decision. The uncertain economic scenario of the host often encourages investors to follow "wait and watch" policy and as a result hampers flow of capital. The possible uncertainty of return in the future deters present investment. Though the focus is on macroeconomic uncertainties and its influence on FDI, other relevant variables are also taken into account to avoid biased result.

Locational factors of the host country do matter for the investment decision, macroeconomics uncertainty and macroeconomic variables need a revisit in describing

the FDI flow towards developing countries. To assess the impact of potential variables on FDI in developing countries, 28 developing countries are selected for the purpose. In this study, an attempt is made to measure the macroeconomic uncertainty of each host country. The impact of macroeconomic uncertainty along with GDP growth, trade openness, FDI stock position and exchange rate of the host country on Foreign Direct Investment are analyzed.

Chapter-3

Foreign Direct Investment into Developing Countries: Trends and Prospects

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3.1. Introduction

Rising integration of developing economies with the rest of the world may have influenced FDI inflow. The World Trade Organization (WTO) paved the way for level playing field for economies despite the different level of development. Cry for fair trade by the developing countries expected to bring the equitable distribution of foreign capital. The Recent decade has witnessed a tremendous rise in the flow of FDI. The World at large is more economically integrated than before due to cross country flow of capital and technology. The locations of production have been more diverse over the years due to more integration.

FDI flow got the momentum soon after the World War II since then it has emerged as one of the better means of the non-debt fund for any economy. Historically, developed countries were the destinations for Foreign Direct Investment. Graham and Krugman (1993) are of the view that in 1980's and 1990's much of the FDI flow was between the regional blocks like EU, North America and Southeast Asia.

Developing countries which are in the stage of economic transition requires the capital that not only fulfills the saving-investment gap but also brings some technological aspect with it. The need of capital in the process of development is inherent. FDI, a stable and

reliable source of investment has a definite role to perform in the process of economic development. There has been some phenomenal change in the structure and directions of international capital flow. Developing economies have received much of world's total FDI. Poorest countries are not attractive enough despite the fact of low wage rate. Projection says, developing country will remain at the top in attracting FDI in coming years.

3.2. Capital Inflow to Developing Countries Since 1990

FDI has emerged as one of the major sources of the non-debt foreign fund; it has experienced many structural changes over the years. The recent trend of the foreign fund has favored developing and less developed countries. Empirical studies have revealed a direct link between FDI inflow and economic prosperity of the country concerned.

FDI has undergone many shifts in directions as well in the destination. History reveals it is the USA which was routing much of funds towards European nations in 1950's. The direction of FDI reversed in 1980 the USA became a net recipient of FDI. On the other hand, Japan emerged as a destination for foreign capital in the form of FDI. Africa, in early 1960 was economically better off than East Asian economies and the situation flipped which is termed as "East Asian miracle". The tremendous growth achievement was largely due to capital accumulation (Kinuthia, 2010) and the success of South-East was because of the rise in FDI inflow. The growth story of South-East Asian nation is credited with the rise of FDI inflow.

FDI inflow to the different group of countries does not remain same. The trend may change in favor of some group of countries due to various economic factors.

In this chapter, FDI inflows from 1990 to 2014 are analyzed. To analyze the FDI trend annual data is taken into consideration.

The aim of the chapter is to analyze the relative position of developing and developed countries in terms of FDI inflow. Integration between developing country and the global market is on the rise. Increased integration has resulted in a surge in the flow of FDI towards developing countries. The classification of developing country is framed on the basis of UNCTAD classification of July 2015. Developing countries have the potential to attract multinationals due to the availability of adequate factors of production. As per UNCTAD, countries are classified into several groups such as developing economies, developed economies and transition economies etc. Developing and developed groups of economies are the major group of countries and hence these two groups are taken into consideration for the analysis of Foreign Direct Investment. These two groups of countries are the interest of the research. FDI inflow share of transition economies out of the world's total share is negligible. Hence, it is excluded from the analysis.

FDI position of countries can be assessed by analyzing absolute FDI inflow or through FDI inflow with respect to a specific base year. Comparison of FDI inflow with respect to a base year makes the comparison more understandable and unambiguous. Comparison with respect to base year enables us to understand the relative position of FDI with respect to the base year.

Let's start the discussion with the Foreign Direct Investment inflow of the world, developing economies and developed economies.

Table 3.1: FDI Inward Flow

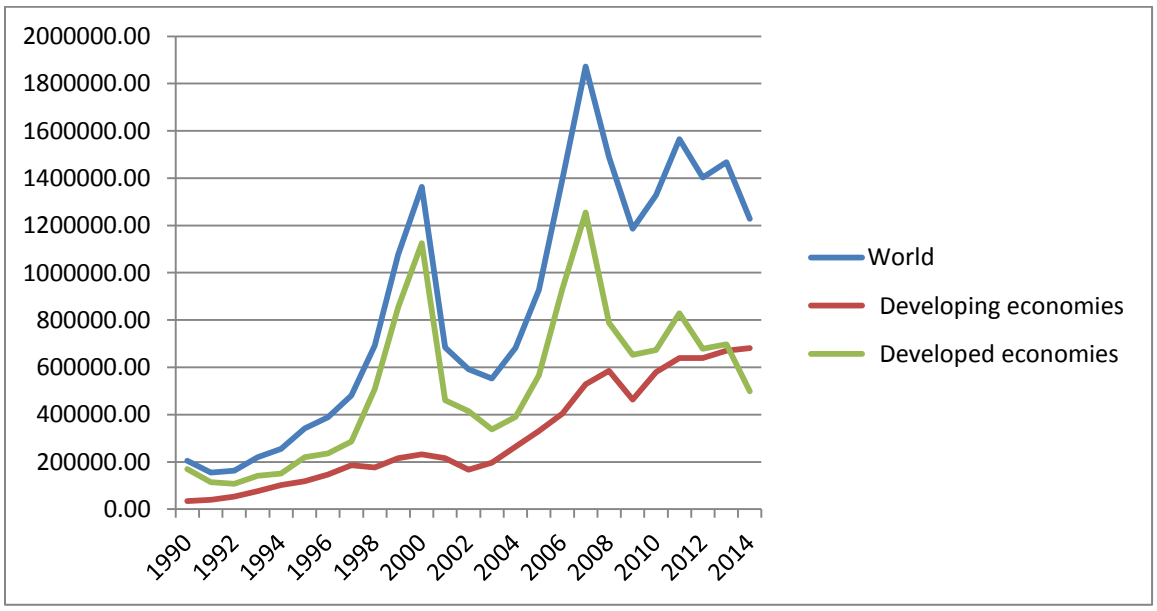
Year	World	Developing Economies	Developed Economies
1990	204895.94	34607.96	170212.77
1991	154138.28	39433.37	114501.39
1992	163007.34	53406.92	107949.35
1993	220145.99	75704.55	141416.73
1994	254906.18	102387.27	150584.38
1995	341536.94	117766.78	219771.64
1996	388737.01	147071.85	236327.00
1997	481230.05	185720.63	285702.71
1998	692336.08	176630.66	508536.94
1999	1076312.63	216178.86	852978.49
2000	1363215.34	232216.07	1125226.81
2001	684070.93	215594.22	460725.93
2002	591385.70	166731.84	414570.25
2003	551992.56	196307.66	337648.08
2004	682749.32	264079.92	389511.80
2005	927402.30	330178.04	565423.16
2006	1393033.58	403881.05	930174.59
2007	1871701.58	528535.55	1254988.27
2008	1489732.09	585647.33	787760.78
2009	1186512.85	463636.97	652306.17
2010	1328215.31	579890.60	673223.42
2011	1564934.67	639135.17	828446.73
2012	1403115.47	639021.52	678960.20
2013	1467149.02	670789.92	696770.44
2014	1228283.32	681386.67	498784.41

Date Source: UNCTAD Stat (Figures are in millions of USD).

From table 3.1 it can be observed that during 1990 to 2014, FDI figure of the world attained the peak in the year 2007 i.e. 1871701.58 million of USD. For developing countries, maximum FDI figure corresponds to the year 2014. FDI figure of developed countries reached maximum level in 2007.

FDI inflow of the world as a whole increased 6.65 times in 2000 in respect of 1990. Developing economies registered a rise of FDI inflow of 6.70 times in 2000 in respect of 1990. It is 19.68 times in 2014 with respect to 1990.If one looks at the figure of developed economies, the inflow of FDI increased 6.61 times in 2000 with respect to 1990. FDI figure increased around 3 times in 2014 with respect to 1990. Foreign Direct Investment into developing countries has shown rise at the cost of FDI inflow into developed countries.

Figure 3.1: FDI Inflow Trend



Source: (www.unctad.org). Figures are in millions of USD.

FDI inflow trend of developing economies is smooth over the years. The graphical pattern of FDI with respect to the world and developed country are almost identical but with different dimensions. For the first time ever, in 2014 developing countries received more FDI inflow than developed countries.

FDI Index

FDI index is constructed so as to make a relative comparison of FDI inflow with reference to a particular year. It makes the comparison more sensible.

The formula for the FDI index is described as follows:

$FI = (FDI_t/FDI_b) *100$

FI --- FDI Index

FDI_t---FDI at t year

FDI_b—FDI at the selected base year

b---Base year = 2010

t----Time period ranges from 1990 to 2014

Table 3.2: Index of FDI flow

Year	World index	Developing Economies Index	Developed Economies Index
1990	15.43	5.97	25.28
1991	11.60	6.80	17.01
1992	12.27	9.21	16.03
1993	16.57	13.05	21.01
1994	19.19	17.66	22.37
1995	25.71	20.31	32.64
1996	29.27	25.36	35.10
1997	36.23	32.03	42.44
1998	52.13	30.46	75.54
1999	81.03	37.28	126.70
2000	102.64	40.04	167.14
2001	51.50	37.18	68.44
2002	44.52	28.75	61.58
2003	41.56	33.85	50.15
2004	51.40	45.54	57.86
2005	69.82	56.94	83.99
2006	104.88	69.65	138.17

2007	140.92	91.14	186.41
2008	112.16	100.99	117.01
2009	89.33	79.95	96.89
2010	**100.00**	**100.00**	**100.00**
2011	117.82	110.22	123.06
2012	105.64	110.20	100.85
2013	110.46	115.68	103.50
2014	92.48	117.50	74.09

Source: (Own calculation)

Table 3.2 shows the index of FDI flow of the world, developing countries and developed countries. The index is created with 2010 as the base year. Reason for considering 2010 as the base year is that analysis of relative FDI performances in recent years can be done with ease. Recent years (2010 onwards) have witnessed some ups and down in the total FDI inflow of the world economy as well as developed economies. However, a considerable stable and rising figure is witnessed in the FDI inflow towards developing economies.

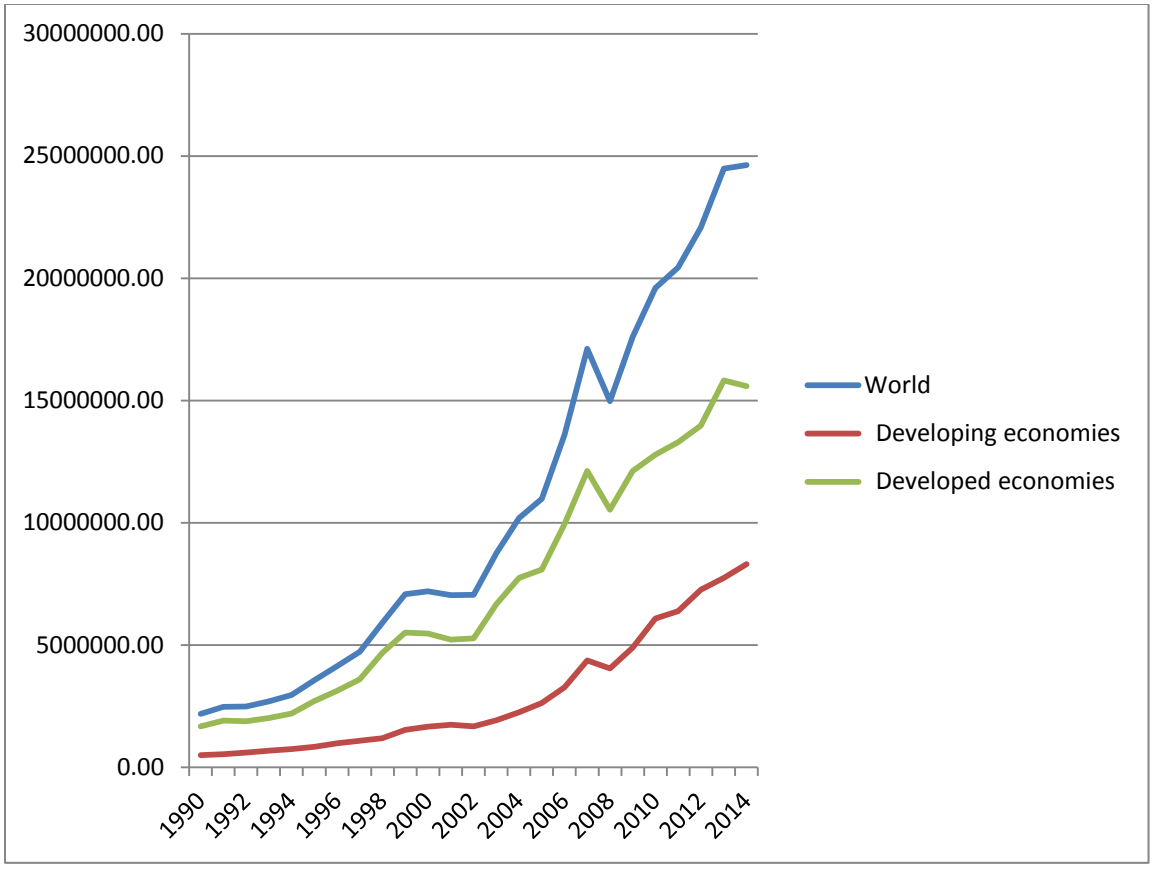
Foreign Direct Investment Stock: Accumulation of FDI inflow figure over the years gives rise to FDI stock figure. It is measured at a given point in time. UNCTAD defines FDI inward stock in following words "FDI stock is the value of the share of their capital and reserves (including retained profits) attributable to the parent enterprise, plus the net indebtedness of affiliates to the parent enterprises."

Table 3.3: FDI Inward Stock

Year	World	Developing economies	Developed economies
1990	2197767.70	510107.43	1686008.67
1991	2472868.74	548147.05	1922533.61
1992	2495531.19	605528.14	1889627.16
1993	2700733.91	682375.95	2016077.22
1994	2965624.42	758044.88	2201145.90
1995	3566349.31	844130.04	2711247.47
1996	4136063.18	982824.31	3136871.89
1997	4723051.55	1090750.37	3605435.18
1998	5919876.53	1198604.18	4690337.56
1999	7090316.73	1541354.35	5509231.82
2000	7203815.46	1669811.74	5476613.00
2001	7047348.99	1740761.74	5223130.15
2002	7062663.50	1677129.02	5276784.28
2003	8755331.04	1935009.07	6674873.50
2004	10195641.71	2256099.62	7754593.50
2005	10988575.18	2639002.22	8091719.64
2006	13597801.03	3275234.22	9956093.09
2007	17125905.70	4374653.07	12120936.95
2008	14979375.87	4044841.27	10541808.92
2009	17610027.05	4904736.70	12119160.75
2010	19607406.46	6088657.36	12789149.55
2011	20441729.35	6392828.68	13304618.57
2012	22073174.97	7261542.26	13974635.63
2013	24483725.63	7748171.82	15821080.52
2014	24626455.45	8310054.59	15591435.46

Date Source: UNCTAD Stat (Figures are in millions of USD).

Figure 3.2: Trend of FDI Stock



FDI stock figures are in millions of USD.

In figure 3.2, throughout the years, FDI stock figure of developed countries is well ahead of developing countries. The trend of FDI stock of the world as a whole is upward rising. The pattern of the trend of developing and developed country is also similar to that of the trend of the World.

Table 3.4: Index of FDI Stock

Year	World Index	Developing Economies Index	Developed Economies Index
1990	11.21	8.38	13.18
1991	12.61	9.00	15.03
1992	12.73	9.95	14.78
1993	13.77	11.21	15.76
1994	15.13	12.45	17.21
1995	18.19	13.86	21.20
1996	21.09	16.14	24.53
1997	24.09	17.91	28.19
1998	30.19	19.69	36.67
1999	36.16	25.32	43.08
2000	36.74	27.42	42.82
2001	35.94	28.59	40.84
2002	36.02	27.55	41.26
2003	44.65	31.78	52.19
2004	52.00	37.05	60.63
2005	56.04	43.34	63.27
2006	69.35	53.79	77.85
2007	87.34	71.85	94.78
2008	76.40	66.43	82.43
2009	89.81	80.56	94.76
2010	**100.00**	**100.00**	**100.00**
2011	104.26	105.00	104.03
2012	112.58	119.26	109.27
2013	124.87	127.26	123.71
2014	125.60	136.48	121.91

Source: (Own calculation)

In table 3.4, a close inspection of numbers of the growth index of the world reveals that apart from 2008 all years has registered a rise vis-à-vis previous year.

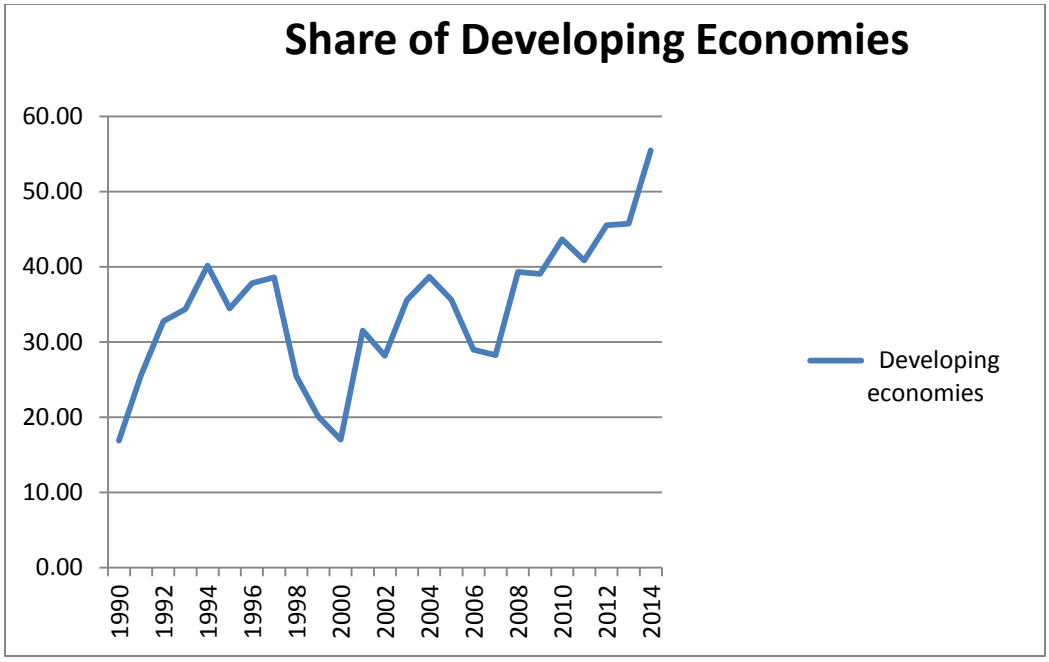
Table 3.5: FDI flow Share of Developing and Developed Economies

Year	Developing Economies	Developed Economies
1990	16.89	83.07
1991	25.58	74.28
1992	32.76	66.22
1993	34.39	64.24
1994	40.17	59.07
1995	34.48	64.35
1996	37.83	60.79
1997	38.59	59.37
1998	25.51	73.45
1999	20.09	79.25
2000	17.03	82.54
2001	31.52	67.35
2002	28.19	70.10
2003	35.56	61.17
2004	38.68	57.05
2005	35.60	60.97
2006	28.99	66.77
2007	28.24	67.05
2008	39.31	52.88
2009	39.08	54.98
2010	43.66	50.69
2011	40.84	52.94
2012	45.54	48.39
2013	45.72	47.49
2014	55.47	40.61

Date Source: UNCTAD Stat . FDI flow measured in percentage of the world's total.

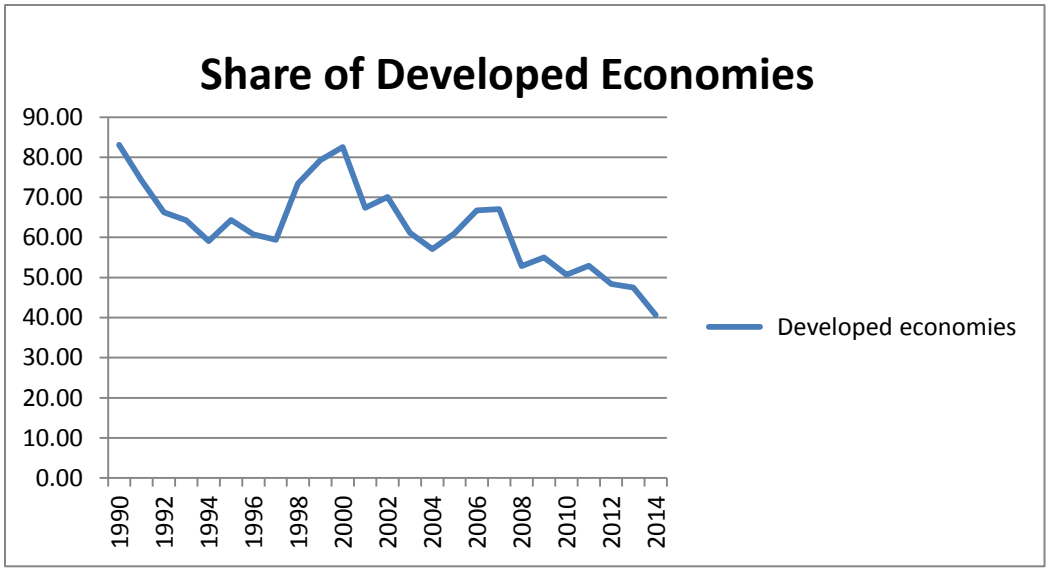
It can be seen from table 3.5 that the share of developed country out of the world's total share reduced to less than 50% in the year 2012. Prior to 2012, not a single year had witnessed such a phenomenon. Over the years, the share of FDI inflow of developing countries has increased whereas the share of developed countries has gone down.

Figure 3.3: FDI Flow Share of Developing Economies out of the World's total



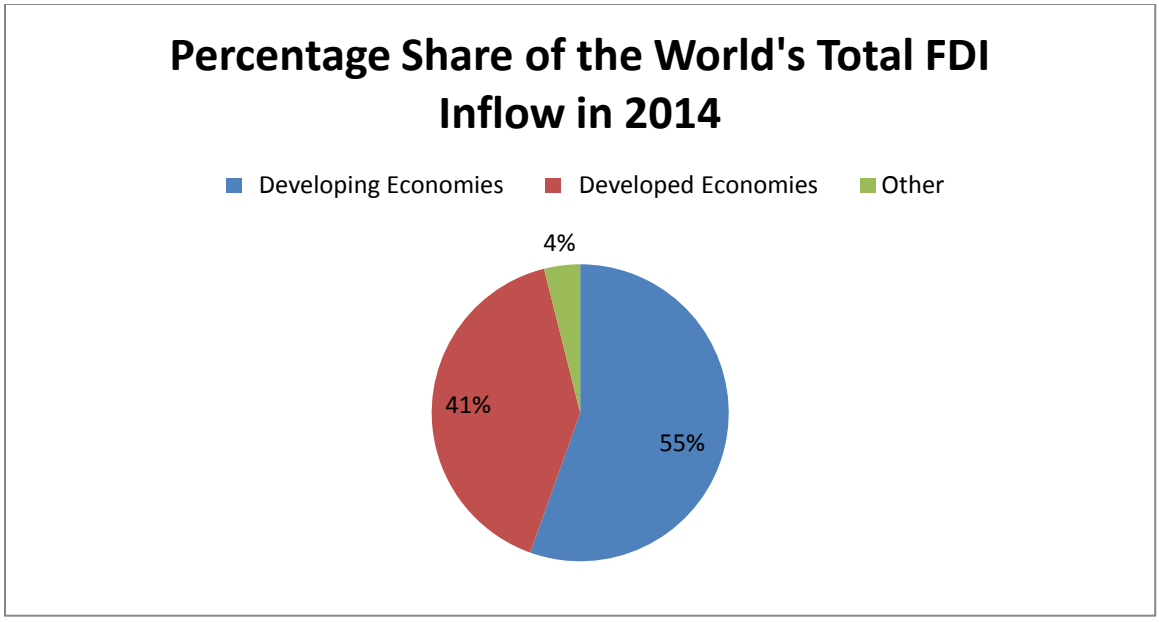
Above figure shows the FDI inflow share of developing economies out of the World's total FDI inflow.

Figure 3.4: FDI Flow Share of Developed Economies out of the World's total



Above figure shows the FDI inflow share of developed economies out of the World's total FDI inflow.

Figure 3.5: FDI Flow Share of Developing and Developed Economies in 2014



The above Pie chart shows the share of FDI inflow of developing and developed countries out of the world's inflow in the year 2014.

Table 3.6: FDI Stock Share of Developing and Developed Economies

Year	Developing Economies	Developed Economies
1990	23.21	76.71
1991	22.17	77.75
1992	24.26	75.72
1993	25.27	74.65
1994	25.56	74.22
1995	23.67	76.02
1996	23.76	75.84
1997	23.09	76.34
1998	20.25	79.23
1999	21.74	77.70
2000	23.18	76.02
2001	24.70	74.11
2002	23.75	74.71
2003	22.10	76.24
2004	22.13	76.06
2005	24.02	73.64
2006	24.09	73.22

2007	25.54	70.78
2008	27.00	70.38
2009	27.85	68.82
2010	31.05	65.23
2011	31.27	65.09
2012	32.90	63.31
2013	31.65	64.62
2014	33.74	63.31

Date Source: UNCTAD Stat . FDI stock measured in percentage of the world total.

It can be seen from table 3.6 that the FDI inward stock of developed economies is well above the FDI stock position of developing economies. Share of developing economies in terms of percentage of the world's total was 23.21 % in 1990 and subsequently increased to 33.74 % in 2014. On the other hand share of developed economies registered a decline from 76.71% in 1990 to 63.31 % in 2014.

Figure 3.6: FDI Stock Share of Developing and Developed Economies

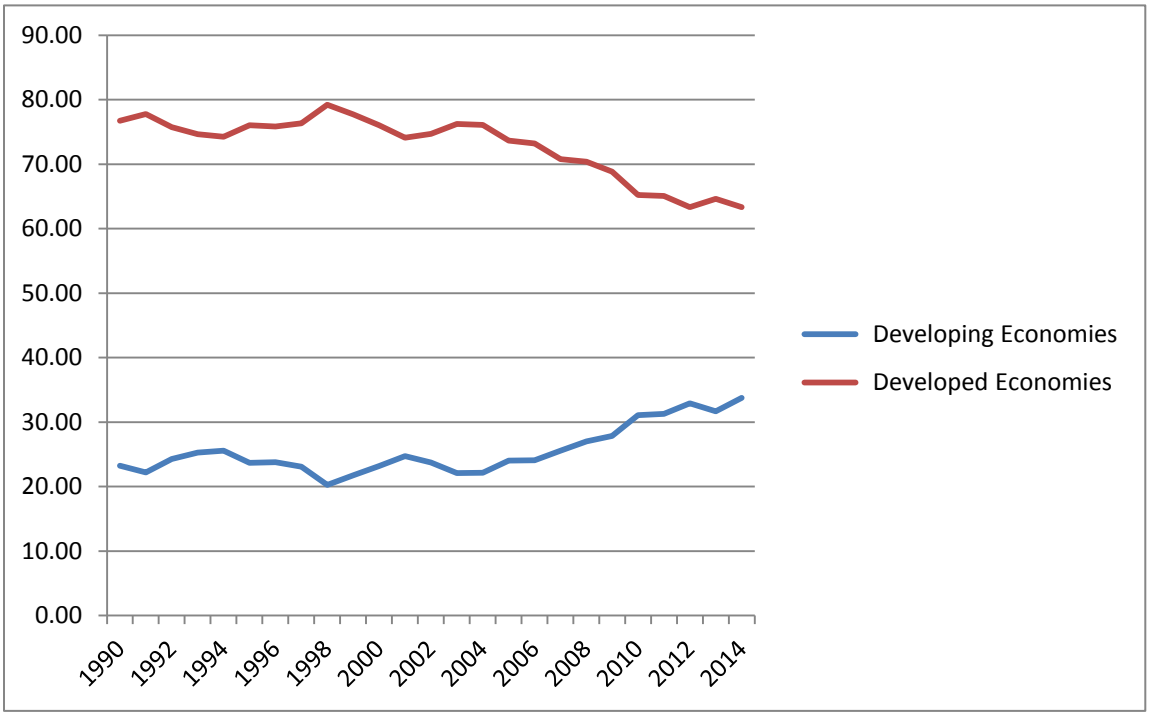


Figure 3.6 depicts FDI inward stock of developing and developed economies which are measured in terms of percentage of the world total inflow.

It clearly discloses that FDI stock of developing countries has followed a kind of upward trend. On the other hand, FDI stock of developed countries has followed a downward trend. Visual inspection clearly reveals that the gap between the lines has narrowed downed over the years. And the lines are much closer in recent years.

Table 3.7: FDI Flow to Developing and Developed Economies in Percentage of GDP

Year	World	Developing Economies	Developed Economies
1990	0.90	0.88	0.94
1991	0.64	0.95	0.60
1992	0.63	1.16	0.53
1993	0.85	1.54	0.69
1994	0.92	1.94	0.68
1995	1.11	1.94	0.91
1996	1.24	2.26	0.97
1997	1.56	2.79	1.20
1998	2.27	2.93	2.10
1999	3.38	3.51	3.36
2000	4.16	3.50	4.38
2001	2.09	3.17	1.80
2002	1.73	2.33	1.56
2003	1.43	2.46	1.13
2004	1.63	3.11	1.17
2005	1.97	3.00	1.62
2006	2.78	3.31	2.53
2007	3.35	3.79	3.12
2008	2.48	3.65	1.85
2009	2.10	2.98	1.62
2010	2.13	2.99	1.61
2011	2.27	2.87	1.85
2012	2.01	2.72	1.52
2013	2.08	2.80	1.55
2014	1.69	2.61	1.09

Date Source: UNCTAD Stat The above table shows the number which is in the percentage of the corresponding GDP.

In 1990,the world's total FDI inflow was a mere 0.90 percent of the World's total GDP and FDI flow in percentage of Gross Domestic Product for developing and developed countries were 0.88 and 0.94 respectively(refer to table 3.7).

In the year 2014 world's total FDI inflow was mere 1.69 percentage of the World's total GDP and FDI flow in percentage of Gross Domestic Product of developing countries was 2.61 percent and for developed countries, it was 1.09 percent(refer to table 3.7).

Table 3.8: FDI Flow to Developing Economies on the Basis of Geographical Location

Year	Developing Economies: Africa	Developing Economies: America	Developing Economies: Asia	Developing Economies: Oceania
1990	2845.14	8522.81	22907.54	332.47
1991	3536.14	11191.47	24488.18	217.58
1992	3800.59	16054.48	33359.25	192.60
1993	5443.75	13815.29	56253.35	192.16
1994	6104.49	27668.37	68444.70	169.71
1995	5655.13	29854.71	81703.89	553.04
1996	6037.85	43590.24	97332.27	111.50
1997	11030.17	65918.26	108594.63	177.58
1998	11627.37	71146.10	93554.75	302.44
1999	11834.68	88551.72	115383.07	409.39
2000	9624.41	79630.80	142787.82	173.03
2001	19947.47	72636.81	122807.02	202.92
2002	14693.05	56156.10	95755.78	126.91
2003	18230.83	46122.04	131603.69	351.11
2004	17737.80	68009.37	177939.16	393.59
2005	29505.55	75344.92	224983.38	344.20
2006	34528.28	73480.42	294410.20	1462.15
2007	50206.30	116593.51	360562.00	1173.75
2008	57769.55	137681.10	387838.49	2358.19
2009	54379.24	83513.58	323792.53	1951.62
2010	44072.22	131727.13	401851.17	2240.08
2011	47704.97	163867.72	425308.19	2254.28
2012	56435.44	178049.30	400839.58	3697.20
2013	53968.73	186150.55	427879.21	2791.43
2014	53912.12	159404.95	465285.24	2784.36

Date Source: UNCTAD Stat (Figures are in millions of USD).

In table 3.8, FDI inflow to developing countries is further classified on the basis of geographical location. Developing Asian countries enjoy a greater share of FDI inflow out of the total FDI flow towards developing economies.

Table 3.9: FDI Flow Share of Developing Economies on the Basis of Geographical Location

Year	Developing economies	Developing economies: Africa	Developing economies: America	Developing economies: Asia	Developing economies: Oceania
1990	16.89	1.39	4.16	11.18	0.16
1991	25.58	2.29	7.26	15.89	0.14
1992	32.76	2.33	9.85	20.46	0.12
1993	34.39	2.47	6.28	25.55	0.09
1994	40.17	2.39	10.85	26.85	0.07
1995	34.48	1.66	8.74	23.92	0.16
1996	37.83	1.55	11.21	25.04	0.03
1997	38.59	2.29	13.70	22.57	0.04
1998	25.51	1.68	10.28	13.51	0.04
1999	20.09	1.10	8.23	10.72	0.04
2000	17.03	0.71	5.84	10.47	0.01
2001	31.52	2.92	10.62	17.95	0.03
2002	28.19	2.48	9.50	16.19	0.02
2003	35.56	3.30	8.36	23.84	0.06
2004	38.68	2.60	9.96	26.06	0.06
2005	35.60	3.18	8.12	24.26	0.04
2006	28.99	2.48	5.27	21.13	0.10
2007	28.24	2.68	6.23	19.26	0.06
2008	39.31	3.88	9.24	26.03	0.16
2009	39.08	4.58	7.04	27.29	0.16
2010	43.66	3.32	9.92	30.25	0.17
2011	40.84	3.05	10.47	27.18	0.14
2012	45.54	4.02	12.69	28.57	0.26
2013	45.72	3.68	12.69	29.16	0.19
2014	55.47	4.39	12.98	37.88	0.23

Date Source: UNCTAD Stat. The above numbers are in percentage of FDI inflow out of the world's total inflow.

In table 3.9, on the basis of geographical locations of developing economies, developing economies of Asia have the major share out of the percentage of FDI inflow towards

developing economies as a whole. The next major share is concentrated in developing economies of America followed by developing economies of Africa and developing economies of Oceania.

Figure 3.7: FDI Flow Share of Developing Economies on the Basis of Geographical Location

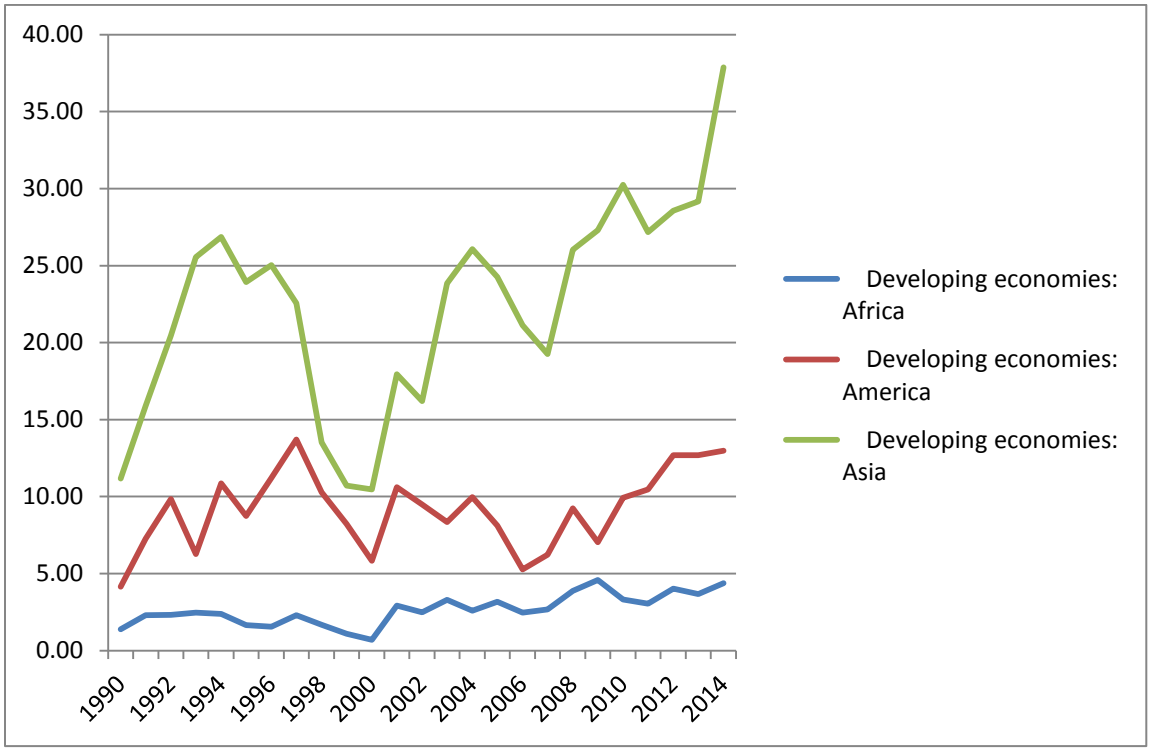


Figure 3.7 shows region wise FDI inflow which is measured in percentage of World's total. Asian economies have experienced several ups and down in FDI inflow which is percentage of world total.

Table 3.10: FDI Share on the Basis of Geographical Location (% of GDP)

Year	Developing economies: Africa	Developing economies: America	Developing economies: Asia	Developing economies: Oceania
1990	0.52	0.79	1.00	2.75
1991	0.65	0.93	1.02	1.64
1992	0.68	1.19	1.25	1.35
1993	0.99	1.02	1.90	1.31
1994	1.17	1.66	2.23	1.07
1995	1.00	1.58	2.27	3.33
1996	1.01	2.29	2.45	0.63
1997	1.79	3.32	2.66	1.00
1998	1.91	3.87	2.54	1.99
1999	1.94	5.29	2.88	2.73
2000	1.51	4.51	3.29	1.18
2001	3.22	3.82	2.84	1.51
2002	2.29	3.13	2.03	0.96
2003	2.38	2.48	2.47	1.94
2004	1.90	4.31	2.87	1.93
2005	2.67	2.87	3.10	1.58
2006	2.73	3.09	3.47	5.94
2007	3.40	4.61	3.54	4.14
2008	3.31	4.81	3.26	7.61
2009	3.33	3.69	2.68	6.65
2010	2.29	3.77	2.80	7.00
2011	2.25	4.16	2.50	6.08
2012	2.47	4.43	2.20	9.48
2013	2.30	4.97	2.19	6.96
2014	2.22	3.96	2.25	6.68

Date Source: UNCTAD Stat.

Table 3.10 shows FDI inflow share to different geographical location and is measured in terms of corresponding Gross Domestic Product. In the year 2014, developing economies of Oceania enjoy a larger inflow of FDI corresponding to its GDP followed by developing economies of America, developing economies of Asia and developing economies of Africa.

3.3. Concluding Remarks

FDI inflow figure of developing economies shows a rise of more than 19 percent in 2014 in relation to 1990. The rise of FDI inflow is more than 6.5 percent for developed countries in 2014 in comparison to 1990.

The trend pattern of inward FDI flow of the world is largely influenced by the FDI flow towards developed economies. Due to the decline of FDI flow towards developed countries and continuous rise of the FDI flow towards developing countries the difference of FDI flow has narrowed down. In 2014, it is the first time in the history that FDI flow to developing countries has crossed the FDI inflow figure to developed countries in absolute term(see figure 3.1).

Index of FDI flow clearly shows that since 2009 developing countries have continuously attracted more FDI inflow vis-à-vis previous year. However, some inconsistent pattern is seen in case of the FDI flow towards developed countries.

FDI inward stock of developed countries is always greater than the stock of FDI of developing countries.

The share of FDI inflow to developing economies was 16.89 % in the year 1990 and 55.47 % in the year 2014. The share of developed countries was as high as 83.07 % in 1990 which reduced to 40.61% in 2014 (see table 3.5).

Apart from 1990 and 2000, in all the years the share of FDI in percentage of its GDP of developing countries is more than the share of developed countries.

Classifications of developing countries on the basis of geographical location reveal that it is the developing economies of Asia which has more share of FDI inflow. After developing economies of Asia it is the developing economies of America which has the second largest share.

FDI share of developing countries on the basis of geographical location reveal that it is the developing economies of Asia which enjoy greater share throughout the years. Trend of FDI inflow towards different geographical location shows that over the years, developing economies of Asia has not only attracted a greater share of FDI but its share has also increased tremendously. The gap between the FDI flow to developing Asia and that of Developing America and Developing Africa has widened. In recent years, there is a sharp rise in the FDI flow towards developing Asia vis-à-vis other regions.

Chapter-4

Macroeconomic Uncertainty and its Impact on Foreign Direct Investment

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4.1. Introduction

Exports and imports figure appear on the current account of the balance of payments. However, the appearance of Foreign Direct Investment (FDI) can be found on the capital account of the balance of payments. Corporate control is the key aspect of FDI which distinguishes FDI from portfolio investment. Ownership control of 10 percent or more is termed as FDI. FDI improves total factor productivity by means of creating technological and human capital externality. At the same time, it also generates additional employment opportunity for the unemployed and also a source of tax revenue to the government exchequer.

The relative strength of push and pull factors determine the quantum of capital flow towards a particular destination. FDI can be viewed as an investment decision in which the investors invest away from the home country. In other words, two countries are involved in the process of investment. Like any other investment decision, the decision to invest away from host country depends on the aspects of both risk and return of such investment. Economies which are financially stable tend to attract a larger proportion of capital flow vis-à-vis the financially unstable countries.

There are many theories that have been developed over the years focusing on different aspects and dimensions of FDI.The theories behind FDI determinants suggest that the flow of FDI depends on the variables that affect firm's profitability and hence

macroeconomic uncertainty and stable political environment of the host country do affect inflow of FDI.

There are many factors that act as motivation for a firm to invest outside of its original destination.The factors can be broadly categorized into Economic and non-economic factors. Investors are forward-looking and keep a vigil look on the possible economic uncertainty. Economic uncertainty works as a negative incentive for the potential foreign investor. Among the many macroeconomic factors, Macroeconomic uncertainty particularly exchange rate uncertainty is an important factor that investors always looks on. Exchange rate uncertainty has the bearing on the future prospect of the rate of return and on the value of the asset in the host country in terms of the value in home country currency. A stable macroeconomic environment is an important aspect for FDI because investors are certain about the possible direction of the economy before investing money (Hess (2000)).

Research works related to capital mobility and uncertainties largely focus on the factors like demand, exchange rate uncertainty, and political risk (Itagaki (1981), Sung and Lapan (2000), Campa (1993), Firoozi (1997) & Goldberg and Kolstad (1994)). Despite various studies on the issue, the linkage between investment and uncertainty is not conclusive.

Study of Dixit (1989), Dixit and Pindyck (1994) & Dixit and Pindyck (1995) throw light on the importance of the uncertainty of future gain and cost of the investment proposal.

Flexible investment timing gives the investor an option to follow “wait & see policy” if uncertainty persists in the economy. Uncertainty in economic variables does adversely influence the investment decision. Since the future rate of return is the central focus of

investing abroad, the decision of investment gets influenced by the uncertainty factor. Exchange rate uncertainty is one of the most important factors that investors keep a close watch before taking decision for FDI.

The aim of the study is to measure the macroeconomic uncertainty of the host country and its impact on inward foreign direct investment towards that country. Since exchange rate is the most important macroeconomic variable in the context of Foreign Direct investment, the conditional volatility of exchange rate is taken as the proxy for the measurement of macroeconmic uncertainty.

4.2. Methodology Details

In methodology details, methodology related to conditional variance and of non-dynamic panel estimation is discussed.

4.2.1 Measurement of Macroeconomic Uncertainty

Macroeconomic factors play an important role in attracting foreign capital. FDI to transitional economies has increased many folds in recent years. Many theoretical frameworks have explained the flow of FDI among which macroeconomic and institutional factors are prominent.

The adverse macroeconomic situation results in uncertainty that discourages the entrance of foreign capital and also reduces the productivity influence of FDI. FDI is a forward-looking decision and depends on the expected future return initiated by the investment. Exchange rate uncertainty reduces the asset worth investing in the host country and negatively influence the decision of investment away from the home. Even the depreciation of the currency is not helpful for the domestic economy if the price elasticity is low. Most early literature work used standard deviation or variance as a measure to approximate uncertainty which assumes the unconditional measure of volatility. An unconditional measure of volatility like variance or rolling variance has its own disadvantage to gauge uncertainty as pointed out by Solomon and Ruiz (2012).

In the literature of finance, conditional variance is considered as a better measurement over unconditional variance. Conditional variance is preferred to unconditional variance due to

its capability to capture unexpected volatility (Diebold and Nerlove (1989), Bera and Higgins (1993) &Carruth et al. (2000)) and hence Autoregressive Conditional Heteroscedasticity (ARCH)-family model is preferred over unconditional variance measurement.

In this section macroeconomic uncertainty is measured by the conditional variance technique. There are studies that use inflation as the proxy for measuring macroeconomic uncertainty (Busse andHefeker (2007)). Since two countries are involved, investment flows are sensitive to exchange rate movement and exchange rate movements are believed to influence the investment between countries. Some studies distinguish between volatility and uncertainty; however, both the terms are used interchangeably in the study.

To analyze the macroeconomic uncertainty and its impact on Foreign Direct Investment, 28 developing countries are taken into consideration. The macroeconomic uncertainty of each country is measured separately. These countries are considered because of the developing nature of the economy as defined by the UNCTAD and availability of variables of interest. Countries which are included in the study are Algeria, The Bahamas, Bahrain, Bangladesh, Bolivia, Brazil, Burkina Faso, Cambodia, Costa Rica, Guatemala, Honduras, India, Jordan, Kuwait, Laos, Malaysia, Mauritania, Mongolia, Niger, Nigeria, Pakistan, Paraguay, The Philippines, Saudi Arabia, Singapore, Togo, Trinidad and Tobago & Turkey. All countries come under the developing country group as defined by the United Nations Conference on Trade and Development (UNCTAD, July 2015).

Macroeconomic uncertainty delays the investment decision as investor follow wait and watch policy rather than investment. Potential fresh investment takes a hit if macroeconomic uncertainty which is the exchange rate returns variability in this case.

Exchange rate variability influences the investment decision due to various reasons. One reason may be due to the uncertain amount of profit of multinational if the motive is to take the profit from host country to the home country. Large variation is associated with uncertain investment framework for multinational. Business activity takes a hit if uncertainty in the investment that is inherent if movement in the exchange rate is uncertain.

4.2.2. Augmented Dickey-Fuller (ADF) Test

The foremost step of dealing with time series is to check the unit root property. Augmented Dickey-Fuller (ADF) Test is used to ascertain the stationary property of the exchange rate series. Monthly exchange rate data is from 1996M1 to 2013M12. Exchange rate change which is the percentage change of REER index is found to be stationary at level with an intercept in all the country cases. The lag length of the ADF test is determined by the Schwarz information criterion (SIC). The null hypothesis of unit root is rejected at 1 percent level of significance. Test statistics of ADF test of each individual country is presented in Table 4.1.

Table 4.1: Tests for a Unit Root

Country	t-statistics	Lag length	P-value
Algeria	-12.2312	0	0.0000
The Bahamas	-10.1725	1	0.0000
Bahrain	-11.1911	0	0.0000
Bangladesh	-10.8939	1	0.0000
Bolivia	-9.6101	0	0.0000
Brazil	-9.6249	1	0.0000
Burkina Faso	-14.8936	0	0.0000
Cambodia	-12.1245	0	0.0000
Costa Rica	-9.6243	0	0.0000
Guatemala	-11.9790	0	0.0000
Honduras	-10.7716	0	0.0000
India	-12.4946	0	0.0000
Jordan	-12.2221	0	0.0000
Kuwait	-10.8258	0	0.0000
Laos	-10.5293	0	0.0000
Malaysia	-11.9090	0	0.0000
Mauritania	-11.5102	1	0.0000
Mongolia	-9.6317	1	0.0000
Niger	-13.5922	0	0.0000
Nigeria	-11.6825	1	0.0000
Pakistan	-11.0693	0	0.0000

Paraguay	-11.0669	0	0.0000
The Philippines	-10.8161	0	0.0000
Saudi Arabia	-10.3330	0	0.0000
Singapore	-11.8827	0	0.0000
Togo	-13.1303	0	0.0000
Trinidad and Tobago	-10.2801	0	0.0000
Turkey	-10.1071	1	0.0000

Stationary time series is the precondition before moving to for modeling the uncertainty. Stationarity of each exchange rate change series is confirmed by the Augmented Dickey-Fuller (ADF) test.

4.2.3. Conditional Variance Measurement: ARCH (GARCH)

Investors consider many dimensions of economic prospects before any final call for investment. The idea is to measure macroeconomic uncertainty. Macroeconomic variables are believed to have a certain influence on Foreign Direct Investment. The rate at which a particular currency is exchanged with another currency is termed as the exchange rate. Cross country transaction is largely influenced by exchange rate movement. Exchange rate Movements are likely to influence investment decision if investors have the option to delay investment decision. Investment decisions take a hit if persistent uncertainty in the exchange rate takes place. This is so, because investors try to

avoid the period of macroeconomic uncertainty. The increase in the home currency value makes investment cheaper and vice versa. In general, profits of multinationals are either reinvested in the host country or taken back to the home country. Macroeconomic uncertainty certainly has an adverse effect if the sole motive of multinational is to take the profit away from the host country. Wait and watch policy is undertaken by multinationals if macro uncertainty prevails in the economy. Considering exchange rate as the most important macroeconomic variable with respect to FDI decision, a variation of the same is modeled to measure macroeconomic uncertainty. Conditional variance technique is employed to measure exchange rate uncertainty.

Modeling exchange rate variability gained importance in the flexible exchange rate regime. The world economy has experienced several exchange rate regimes. The way an authority of a country manages its own currency with another currency is known as exchange rate regime. The world economy has experienced several exchange rate regimes. Popular exchange rate regimes are Gold standard, Bretton woods system and flexible exchange rate system. During 1880 to 1914 gold standard operated in the world economy. Bretton woods conference led to Bretton woods system in 1944. Bretton woods or fixed exchange rate system collapsed after USA govt. failed to convert USA dollar for physical gold. The collapse of Bretton wood system is also known as Nixon shock. President Richard Nixon formally suspended the conversion of dollar for gold on 15th august 1971 leading to the collapse of Bretton woods system. The world economy today is under flexible exchange rate system.

To measure macroeconomic uncertainty, conditional variance technique is used. ARCH-family specification is employed to measure such uncertainty. Conditional variance has

several advantages over unconditional variance. Conditional mean of the time series is estimated by the mean equation. Mean and variance equations are simultaneously estimated by the means of the process of iteration. Mean equation can be modeled by an autoregressive (AR) process or pure time series process that is Autoregressive Integrated Moving Average (ARIMA) or AR process with the option of including other explanatory variables. In this case, mean equation is modeled by an ARMA process. Exchange rate uncertainty is taken as the proxy for Macroeconomic uncertainty as measured by ARCH-family models. Following Lemi and Asefa (2001), after obtaining the monthly ARCH (GARCH) variance series, then averaged annually to make annual frequency.

Percentage change of the Real Effective Exchange Rate (REER) index is calculated as the measure of exchange rate change. Real Effective Exchange Rate (REER) index is obtained from Bruegel data set. Monthly data from 1996M1 to 2013M12 are taken into consideration. During the period of study, each country is believed to operate under flexible exchange rate system.

In almost all country cases exchange rate change followed GARCH (1,1) process. However, in a few country cases, ARCH specification is found.

ARCH- family models deal with the volatility of time series data. Many time series follow a pattern in which large variation is followed by large variation and vice versa. This pattern of volatility is called volatility clustering. In such cases, homoscedasticity assumption is likely to be violated. Hence, it is better to analyze patterns of a variable in which variance to depend upon its past history. In econometrics terminology, conditional variance is preferred over unconditional variance. Robert F. Engle developed Autoregressive Conditional Heteroscedasticity (ARCH) in one of the famous articles of

all time entitled 'Autoregressive Conditional Heteroskedasticity with estimates of the variance of United Kingdom inflation' published in Econometrica in 1982. Several developments of ARCH models have taken place. One of the foremost advancement of the ARCH model is the Generalized AutoRegressive Conditional Heteroscedasticity (GARCH) model. GARCH model was developed by Tim Bollerslev in his seminal paper 'Generalised Autoregressive Conditional Heteroskedasticity'. Bollerslev developed GARCH model in 1986.

ARCH-type models are capable of measuring conditional variance. ARCH models suggest that variance of the residual at a given time period depends on the squared error terms from past period. If the possibility of constant variance is limiting then it is better to model the mean and the variance equation simultaneously.

Mean and Variance Equation of ARCH (1) Model

$$Y_t = \alpha + \beta' X_t + \varepsilon_t \quad (4.1)$$

Where $X_t$is a vector of n × k dimension and β' is a k ×1 vector of coefficient.

$$\varepsilon_t \sim iid\ N(0, \sigma^2)$$

Error term is assumed to be independently distributed with a zero mean and constant variance.

$$\varepsilon_t | \ \Omega_t \sim iidN\ (0, \delta^2{}_t)$$

Where Ω_t is the set of information.

Engle modeled the variance of residual (σ^2) in the following way:

$$\sigma_t^2 = \alpha_0 + \alpha_1 \varepsilon_{t-1}^2 (4.2)$$

The equation, $(4.1)$is called mean and (4.2) is called variance equation. Equations of ARCH (1) model clearly reveals that a big shock at past error term likely to influence the present error term. ARCH estimation is done by the method of iteration.

GARCH Model

Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model is an extension of ARCH model.

The GARCH (1, 1) model:

$$Y_t = \alpha + \beta' X_t + \varepsilon_t \qquad (4.3)$$

Where, $\varepsilon_t | \Omega_t \sim iidN\ (0, \delta_t^2)$

$$\delta_t^2 = \alpha_0 + \alpha_1 \varepsilon_{t-1}^2 + \beta_1 \delta_{t-1}^2 \qquad (4.4)$$

Mean and Variance Equation

Different ARMA specification is used to model the mean equation of exchange rate change. Depending on the nature of each time series ARCH-family model is employed to measure the conditional volatility. GARCH (1, 1) model is found to be fit in most of the country cases. In a few country cases, the ARCH model is found to be the best fit. According to Bollerslev et al. (1992), conditional variance is well represented by the GARCH (1, 1). The presence of ARCH effect in the residual of the each time series is confirmed by ARCH LM test.

Significance of ARCH (GARCH) Coefficients

Since the nature of time series is different for each country, different mean equation specification is found. Mean equation specification as well as the variance equation coefficients are reported in table 4.2.

Table 4.2: Variance Equation Coefficients of ARCH (GARCH)

Country	ARMA Model	ARCH (GARCH) Specification	Variance Equation Coefficients		
Algeria	C AR(1) AR(3)	GARCH (1,1)		Coefficient	P-value
			α_1	0.297403	0.0339
			$\delta 1$	0.491327	0.0082
The Bahamas	C AR(1)	GARCH (1,1)		Coefficient	P-value
			α_1	0.050400	0.1029
			$\delta 1$	0.826470	0.0000
Bahrain	C AR(1)	GARCH(1,1)		Coefficient	P-value
			α_1	0.035040	0.3091
			$\delta 1$	0.853906	0.0000
Bangladesh	CAR(1) AR (2)	ARCH 2		Coefficient	P-value
			α_1	0.022448	0.7511
			α_2	0.188471	0.0661
Bolivia	C AR(1) AR(2)	ARCH1		Coefficient	P-value
			α_1	0.181411	0.0015
Brazil	C AR(1) MA (1)	GARCH(1,1)		Coefficient	P-value
			α_1	0.285303	0.0353
			$\delta 1$	0.489610	0.0151
Burkina Faso	C AR(1) MA (1)	GARCH(1,1)		Coefficient	P-value
			α_1	0.144137	0.0668
			$\delta 1$	0.273171	0.5563
Cambodia	C AR(1) AR(2)	GARCH(1,1)		Coefficient	P-value
			α_1	0.143534	0.0309
			$\delta 1$	0.756257	0.0000
Costa Rica	C AR(1) MA (1)	GARCH(1,1)		Coefficient	P-value
			α_1	0.116104	0.1110
			$\delta 1$	0.759287	0.0000
Guatemala	C AR(1) MA (1)	GARCH(1,1)		Coefficient	P-value
			α_1	0.220662	0.0006
			$\delta 1$	0.741857	0.0000
Honduras	C AR(1) MA (1)	GARCH(1,1)		Coefficient	P-value
			α_1	0.194874	0.0027
			$\delta 1$	0.707146	0.0000
India	C AR(1) MA (1)	GARCH(1,1)		Coefficient	P-value
			α_1	0.048574	0.2566
			$\delta 1$	0.651790	0.0000

Jordan	C AR(1) MA (1)	GARCH(1,1)		Coefficient	P-value
			α_1	0.035856	0.2465
			$\delta 1$	0.845724	0.0000
Kuwait	C AR(1) AR(2)	GARCH(1,1)		Coefficient	P-value
			α_1	0.055772	0.0956
			$\delta 1$	0.865881	0.0000
Laos	C AR(1) MA (5)	GARCH(1,1)		Coefficient	P-value
			α_1	0.262593	0.0001
			$\delta 1$	0.733008	0.0000
Malaysia	C AR(1) MA (1)	GARCH(1,1)		Coefficient	P-value
			α_1	0.378816	0.0000
			$\delta 1$	0.574101	0.0000
Mauritania	C AR(1) AR(2)	GARCH(1,1)		Coefficient	P-value
			α_1	0.082372	0.0639
			$\delta 1$	0.709979	0.0005
Mongolia	C AR(1) MA(1)	GARCH(1,1)		Coefficient	P-value
			α_1	0.232521	0.0095
			$\delta 1$	0.763488	0.0000
Niger	C AR(1)	GARCH(1,1)		Coefficient	P-value
			α_1	0.090247	0.1267
			$\delta 1$	0.741981	0.0000
Nigeria	C AR(1) MA (1)	GARCH(1,1)		Coefficient	P-value
			α_1	0.237065	0.0003
			$\delta 1$	0.728387	0.0000
Pakistan	C AR(1)	GARCH(1,1)		Coefficient	P-value
			α_1	0.124119	0.0342
			$\delta 1$	0.762193	0.0000
Paraguay	C AR(1) MA (1)	ARCH1		Coefficient	P-value
			α_1	0.269281	0.0103
The Philippines	C AR(1)	GARCH(1,1)		Coefficient	P-value
			α_1	0.141534	0.0000
			$\delta 1$	0.798016	0.0000
Saudi Arabia	C AR(1) MA (1)	GARCH(1,1)		Coefficient	P-value
			α_1	0.031582	0.3254
			$\delta 1$	0.900025	0.0000
Singapore	C AR(1) MA (1)	GARCH(1,1)		Coefficient	P-value
			α_1	0.083215	0.0725
			$\delta 1$	0.772834	0.0000
Togo	C AR(1) MA (1)	GARCH(1,1)		Coefficient	P-value
			α_1	0.062272	0.0374
			$\delta 1$	0.884559	0.0000

Trinidad and Tobago	C AR(1) MA (1)	GARCH(1,1)		Coefficient	P-value
			α_1	0.147726	0.0081
			$\delta 1$	0.762396	0.0000
Turkey	C AR(1) AR(2)	GARCH(1,1)		Coefficient	P-value
			α_1	0.190766	0.0036
			$\delta 1$	0.802401	0.0000

All ARCH (GARCH) parameters are found to be positive. The sum of variance equation coefficients which represents the shock to conditional variance is less than one in all the country cases.

Table 4.3: Sum of ARCH (GARCH) Coefficients

Country	Sum of ARCH(GARCH) Coefficients
Algeria	0.78
The Bahamas	0.87
Bahrain	0.88
Bangladesh	0.20
Bolivia	0.18
Brazil	0.76
Burkina Faso	0.41
Cambodia	0.89
Costa Rica	0.86
Guatemala	0.96
Honduras	0.89
India	0.69
Jordan	0.87
Kuwait	0.91
Laos	0.99
Malaysia	0.94
Mauritania	0.78
Mongolia	0.99
Niger	0.83
Nigeria	0.95
Pakistan	0.88
Paraguay	0.26
The Philippines	0.93
Saudi Arabia	0.93
Singapore	0.85
Togo	0.94
Trinidad and Tobago	0.90
Turkey	0.99

Table 4.3 presents the sum of coefficients of the variance equation. The sum of the coefficients in all cases is less than one which is the desired condition.

4.2.4. Possible Impact of Macroeconomic Uncertainty on FDI

The trade-off between exchange rate variability and certainty equivalent or expected exchange rate level explains the fact that return on investments and exchange rate volatility are inversely related, hence, higher movement of exchange rate deter capital inflow(Cushman (1985, 1988)).

Production flexibility and risk aversion argument provide different directional prediction of exchange rate volatility implication for FDI. This suggests that the production flexibility argument is less likely to pertain to short term volatility in exchange rates than to realignments over longer term.

Exchange rate uncertainty may have negative impact on FDI if the ultimate aim of the investment is to take the return to the source country. The linkage between the two may be reverse if the motive of investment is to diversify risk and uncertainty in exchange rate often encourages spreading out investment destination which results in more FDI. Positive relation between FDI and exchange rate is expected if the motive of investment is to diversify location of production (Blonigen, 2005).

4.2.5. Summary of Macroeconomic Uncertainty Measurement

The basic aim of the chapter is to measure the macroeconomic uncertainty of 28 developing countries for the time period 1996M1 to 2013M12. To do that exchange rate uncertainty is taken as the proxy. Since exchange rate is the most important macroeconomic factors behind FDI decision it is chosen over other macroeconomic variables. The ultimate intention is to assess the impact of macroeconomic uncertainty of the host country on the inward FDI. After confirming the stationary property of each time series, conditional variance series is calculated with the help of ARCH-family models.

After obtaining the monthly ARCH (GARCH) variance series they are averaged annually to make annual frequency. Monthly variance series are averaged annually so as to match them with annual frequency data of other variables for further econometric exercise. The ARCH (GARCH) variance series under consideration is the macroeconomic uncertainty measurement of the study. The econometric findings related to the impact of macroeconomic uncertainty and other macroeconomic variables on the FDI are discussed in the subsequent sections.

4.2.6. Non-dynamic Panel Estimation

To assess the impact of macroeconomic uncertainty along with other variables on Foreign Direct Investment, non-dynamic panel estimation of Hansen (1999) is employed. First of all, it estimate and the number of threshold in the threshold variable and subsequently estimate the effect of independent variables on the dependent variable.

4.2.7. Assessment of Threshold Effect

To assess the impact of macroeconomic uncertainty on FDI, panel data technique is used. Panel data analysis has several advantages over pure time series or cross section analysis. Here time frequency is in annual frequency. The period of study is from 1997 to 2014 and consists of the data of 28 developing countries. Economic decisions take times. It is more common in the FDI decision. Hence one year lag of each explanatory variable is considered as the function of FDI.

This study has employed Hansen (1999) non-dynamic panel data model. This model is a panel threshold regression model. As per this model the whole sample can be divided into different regimes depending on the value of a variable. The variable on the basis of which the whole sample can be divided is called threshold variable. The division of sample into regimes relies on whether the threshold variable is smaller or larger than the threshold value. Threshold variable is assumed to be time variant. Depending on the threshold value the whole sample is divided into different subsamples. It is basically dividing individual observations on the basis of an observed variable. If one threshold value is found to be significant then the sample is divided into two subsample. One subsample is created on the basis of values which is more than the threshold value and another is less than or equal to the threshold value. If the existence of two threshold value is found then the sample is divided into three subsamples and so on. These subsamples are also known regimes.

Hansen (1999) suggested the estimation of threshold value by the method of least square after fixed effect transformation. Some restrictions are placed regarding the search of

minimal observation to ensure that the search for threshold value take place from each regime. It is necessary to determine the statistical significance of threshold value. The evidence of no threshold is same as the linear constraint $\beta_1 = \beta_2$.The null of no threshold effect is tested by bootstrap method. Bootstrap technique is asymptotically valid. In fact, bootstrap technique tests the statistical significance of LR statistics. Null hypothesis is rejected if the estimated p-value is smaller than the critical value. Gross Domestic Product per capita at Purchasing Power Parity (PPP) is the threshold variable of the study.

Bruce E.Hansen's Threshold Estimation

Single threshold Equation:

$$Y_{it} = \mu_i + \beta_1' x_{it}\, I(q_{it} \leq \gamma) + \beta_1' x_{it}\, I(q_{it} > \gamma) + e_{it} \qquad (4.5)$$

Subscript i refers to cross section identity and t refers to time series; ($1 \leq i \leq n$, $1 \leq t \leq T$)

$Y_{it}$is the dependent variable that is FDI inflow in terms of percentage of GDP is a scalar.

$q_{it}$is the threshold variable.

$x_{it}$is a K vector regressor.

I(.) is an indicator function.

$e_{it}$is the error term.

The error term is assumed to be independent and identically distributed with zero mean and finite variance. The analysis is asymptotic with given T (time series) and infinite N (cross section).The assumption of independent and identically distributed error term excludes the possibility of inclusion of lagged dependent variable as an explanatory variable.

The equation (4.5) can be written as following:

$$Y_{it} = \begin{cases} \mu_{it} + \beta_1' x_{it} + e_{it,} & q_{it} \leq \gamma, \\ \mu_{it} + \beta_2' x_{it} + e_{it,} & q_{it} > \gamma, \end{cases}$$

The equation (4.5) can also be written in the following compact form.

$$x_{it}(\gamma) = \begin{pmatrix} x_{it}\, I\,(q_{it} \leq \gamma \\ x_{it} I\,(q_{it} > \gamma) \end{pmatrix}$$

And $\beta = (\beta_1' \beta_2')'$ so that equation (4.5) equals

$$Y_{it} = \mu_i + \beta_1' x_{it}(\gamma) + e_{it\cdot} \qquad (4.6)$$

The observations are categorized into two regimes conditional upon whether q_{it} is smaller or larger than the thresholdγ. $\beta_1$and β_2 are regression slopes which are different in different regime. Time variant x_{it} is the required condition for the identification of β_1 and β_2.

On the basis of number of threshold and threshold value the whole sample is divided for further econometric analysis.

4.3. Empirical Results

Relying on the non-dynamic panel estimation of Hansen following result is obtained. At first, the number of threshold is estimated. After estimating the number of threshold the whole sample is divided into regimes and subsequently, the impact of macroeconomic uncertainty along with other variables on Foreign Direct Investment is assessed.

4.3.1. Number of Threshold

In the study GDP per capita PPP is the threshold variable. GDP per capita PPP is measured in 2011 international dollar. The result of the number of threshold is reported in table 4.4.

Table 4.4: Tests for Threshold Effects

Test for Single Threshold

Likelihood ratio test of the first threshold	57.43
P- value	0.04
(10%,5% ,1% critical values	48.77, 56.48, 88.65

Test for Double Threshold

Likelihood ratio test of the second threshold	15.55
P- value	0.76
(10%,5% ,1% critical values	32.07, 36.62, 60.30

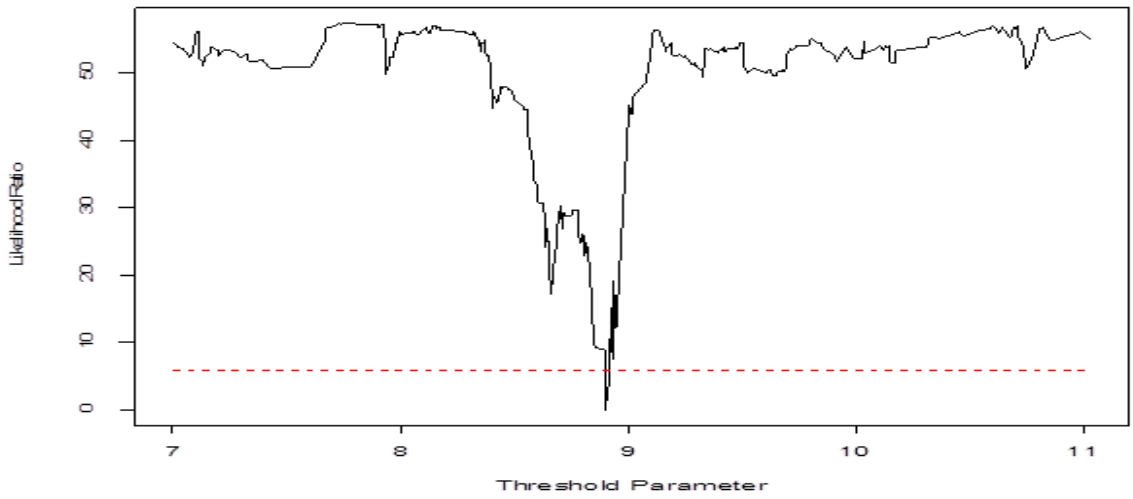
The number of threshold is determined by moving from sequentially from zero, one and two thresholds. Likelihood ratio test for the single threshold is statistically significant with a bootstrap p-value of 0.04. However, the test for double threshold is not statistically significant with a bootstrap p-value of 0.76. From the above finding, presence of single threshold in the regression relationship is confirmed.

As per Hansen's model, the significance of threshold value is tested through bootstrap technique. One move sequentially to proof for the presence of the number of thresholds. In this analysis presence of the single threshold is found. The threshold value is found to be 8.8973. Since the threshold value is in natural logarithm, anti-logarithm of the same will provides the exact level of GDP per capita PPP level at which presence of threshold is found. The exact level of GDP per capita, PPP at 2011 international dollar is calculated to be 7312.2039.

The null of no threshold effect is rejected after 100 bootstrap replications.

The bootstrap p-value is found to be 0.04; it means null of no threshold value is rejected at5 percent level of significance. Likelihood ratio of single threshold is reported in figure 4.1. Due to the presence of single threshold value the whole sample is divided into two regimes and subsequently coefficients are estimated.

Figure 4.1: Confidence Interval Construction in Single Threshold Model



4.3.2. Impact of Macroeconomic Uncertainty and other Macroeconomic Variables on Foreign Direct Investment

The motive of the study is to analyze the macroeconomic factor and its influence on the inward Foreign Direct Investment (FDI). Macroeconomic factors play crucial role in determining the FDI inflow towards any economy.

Variables of the study

Annual frequencies of variables are employed in the study. On the other hand, monthly change REER index is employed to measure exchange rate uncertainty which is used as the proxy for macroeconomic uncertainty. After monthly variance calculation it is averaged annually to form the annual frequency.

The dependent variable of the study is net FDI which is measured as the percentage of the corresponding GDP. Net FDI is defined as new investment less disinvestment. Explanatory variables of the study are GDP growth, trade openness, exchange rate, FDI stock, macroeconomic uncertainty and Gross Domestic Product (GDP) per capita at Purchasing Power Parity (PPP). GDP growth is measured as the annual percentage change of GDP. GDP is defined as the sum of gross value added by the producer in the economy plus net taxes. It makes GDP at market price and is based on constant 2005 USD. Hence, GDP growth refers to real GDP growth. GDP growth is one of the important variables that have been used for years to explain the dynamics of Foreign Direct Investment. Growth of GDP is synonymous with market expansion. Market expansion creates additional opportunity for produced output. This is more important if the motive of the multinational to sell the produced output in the host economy. This has a direct link with the profitability and future course of action for the multinational. Market expansion not only influences the present business action but also the future business prospectus. Multinationals feel a sense of security if the host economy achieves market expansion.

Trade Openness which shows the quantum of trade linkage between countries is defined as the ratio of total trade to GDP. Trade is defined as the sum of exports and imports of goods and services. Investing firm may resort on the import of raw material and export of final commodity and hence amount of the flow of goods and services in and out of the host likely to influence investment decision. Percentage change of REER index is estimated as the measure of Exchange rate.

FDI stock is basically to reflect the previous level of FDI in a country. The previous FDI figures give the information regarding profit and risk situation of the destination country. It is also likely that if multinationals avoid crowded market then higher past FDI level may deter fresh FDI inflow. Macroeconomic uncertainty is measured by the ARCH (GARCH) variance series. Gross Domestic Product (GDP) at Purchasing Power Parity (PPP) is included in the analysis to measure the absolute market size of the corresponding economy. GDP per capita PPP is measured in 2011 international dollar. For scaling down, natural logarithm transformation of FDI inward stock and GDP Per Capita at Purchasing Power Parity (PPP) is carried out before moving for empirical estimation. FDI decision takes time and hence one year lag of explanatory variable is considered for further econometric estimation. Study of Cuyvers et al. (2011) also used one year lag of variables for empirical estimation.

Table 4.5: Data Source

Variable	Data source
Net FDI (% of GDP)	World Development Indicator, World Bank
GDP growth (annual %)	World Development Indicator, World Bank
FDI inward stock	UNCTAD
Trade openness (X+M)/GDP	World Development Indicator, World Bank
REERchn	Bruegel data set
Garchvar	Estimated
GDP per capita Purchasing Power Parity	World Development Indicator, World Bank

Data for Net FDI inflow which is in terms of percentage of GDP is collected from World Development Indicator (WDI), World Bank. GDP growth rate is the rate at which a particular economy expands. GDP growth which is basically the annual percentage change of GDP is also collected from WDI, World Bank. FDI inward stock figures is in millions of U.S. Dollar and obtained from UNCTAD statistics. Trade openness which is

the ratio of trade to GDP is obtained from WDI, World Bank. Change of REER index is calculated as the measure of exchange rate. REER index is collected from Bruegel data set. Garchvar is basically the notation for estimated ARCH (GARCH) annual variance series. GDP per capita PPP reflects absolute market size of a country. GDP per capita Purchasing power Parity is measured on the basis of constant 2011 international dollar and obtained from World Development Indicator, World Bank.

Table 4.6: Summary Statistics

Variable	Median	Minimum	Maximum	S.D.
Netfdigdp	2.7542	-2.4988	45.2732	5.4213
$Gdpgrowth_{-1}$	4.7362	-7.3594	33.7357	3.6765
$Openness_{-1}$	0.8262	0.1558	4.3965	0.6612
$Reerchn_{1}$	1.5499	-75.1383	29.5683	7.0055
$Lnfdistock_{-1}$	8.7287	2.7628	13.6760	2.1066
$Garchvar_{-1}$	2.2668	0.3783	63.1178	7.2238
$LnGDPPPP_{-1}$	8.7138	6.6356	11.4695	1.2034

Net FDI (new investment less disinvestment) which is measured in terms of percentage of GDP is the dependent variable of the study. Other variables with a year lag are explanatory variables.

This analysis makes use of an extended version of non-dynamic panel estimation of Bruce E. Hansen.

Bruce E.Hansen's Non-dynamic Panel estimation

Hansen's non-dynamic panel estimation is a threshold regression model. Fixed effect transformation is used to estimate threshold value and regression slope coefficients. Threshold regression technique is useful in cases where a sample fall into discrete classes. It means the regression function is not identical across a sample. According to the

threshold regression each observation are classified into different groups depending on the threshold value. Confidence interval of the parameter is derived from asymptotic distribution theory. Bootstrap technique is used to test the statistical significance of threshold value.

The threshold model is estimated to investigate whether income level which is the per capita GDP at PPP terms of corresponding host country affect the inward FDI inflow.

"PdR" package inR

"pdR" package in R software is an extension of Hansen's non-dynamic panel model. Explanatory variables can be classified as regime-dependent and regime-independent variables. If an explanatory variable is assumed to be regime dependent it means the variable influence the dependent variable differently in each regime. In each regime the regression slope coefficients are different. If an explanatory variable is classified as regime-independent variable it means the influence of the explanatory variable does not change throughout the regimes. To check the statistical significance of the threshold value, bootstrap technique is suggested by Hansen. This non-dynamic model fairly suits the balanced panel data. In balanced panel data, the number of time series in each cross section is same. In this case, 18 annual time series for each cross section comprises the whole sample.

The sample consists of 28 developing country and the time period for each cross section ranges from 1997 to 2014. Hansen (1999) model is based on the assumption that all the explanatory variables are exogenous. "pdR" package is a newly developed package in "R" software. Ho Tsung-wu is the developer of "pdR" package. This "R" package is an

extension of Hansen (1999) non-dynamic panel threshold model. "ptm" function of the "pdR" package is designed to estimate the Hansen's threshold model. The "ptm" function allows incorporating more than one regime-dependent independent variable unlike the Hansen's original code which allows only one regime-dependent variable. Two regime-dependent variables are taken into consideration for the analysis. In this analysis, LnGDPPPP and Garchvar are considered as the regime-dependent variable. It means depending on the regime both variables will have a different influence on the dependent variable. The regime independent co-efficient and regime dependent co-efficient is reported in table 4.7 and 4.8 respectively.

Table 4.7: Regime-Independent Coefficients

Variable	Coefficient	White Standard Error	t-stat
$Gdpgrowth_{-1}$	0.1194	0.0517	2.3110
$Openness_{-1}$	3.4357	1.6936	2.0285
$Lnfdistock_{-1}$	1.6126	0.2619	6.1572
$Reerchn_{-1}$	-0.0275	0.0190	-1.4471

Table 4.8: Regime-Dependent Coefficients

Variable and Regime	Coefficient	White Standard Error	t-stat
$LnGDPPPP_{-1}$(Regime 1)	-5.0513	1.3407	-3.7677
$Garchvar_{-1}$ (Regime 1)	-0.0762	0.0171	-4.4392
$LnGDPPPP_{-1}$(Regime 2)	-3.8682	1.3082	-2.9568
$Garchvar_{-1}$ (Regime 2)	0.0176	0.0177	0.9948

Regime- independent Coefficients and Statistical Significance

GDP growth, Trade openness and FDI stock are found to be positive and statistical significant in attracting FDI. Trade openness which is measured by the ratio of total trade of goods and services to GDP is found to have greater influence on FDI. A change in the Real Effective Exchange Rate is included in the analysis for measuring exchange rate but have no influence on FDI.

Regime-dependent Coefficients and Statistical Significance

GDP per capita at Purchasing Power Parity and Garchvar series are considered as regime-dependent variables. A close look on the different regimes reveals that macroeconomic uncertainty has a negative impact on FDI inflow in the first regime. However, in the second regime, it is found to have no influence on inward FDI.

The argument for this is that after a country reaches a certain level of income negative impact of macroeconomic uncertainty fades away. Macroeconomic uncertainty deters FDI if the income level of a country is below a certain threshold. Once income level goes past the threshold level may be due to other factors the negative impact of macroeconomic uncertainty disappears.

4.4. Concluding Remarks

Investment decisions are multivariate function. There are many variables that may have an influence on FDI. The basic intention is to explore the linkage between macroeconomic factors and FDI. Macroeconomic scenario of the host country plays an important role in determining the investment decision of multinationals. Certainty of return is also a function of Foreign Direct Investment. Macroeconomic variables which have theoretical linkage with FDI are GDP growth, trade openness and exchange rate etc. In this analysis, apart from macroeconomic factor, FDI flow is also a function of FDI stock. The basic idea behind the inclusion of FDI stock in the group of other explanatory variable is due to the fact that FDI stock position of a country reflects the success of previous multinationals.

ARCH family model is used to estimate the conditional variance of exchange rate which is the proxy for macroeconomic uncertainty. Apart from a few countries, GARCH (1, 1) is found to be the best fit. After measuring macroeconomic uncertainty, the impact of macroeconomic uncertainty along with other potential macroeconomic variables is analyzed. To serve the purpose non-dynamic panel technique is employed. Relying on the econometric technique presence of the single threshold is found. GDP per capita at Purchasing Power Parity (PPP) is the threshold variable of the study.

Among the regime independent variables, GDP growth, trade openness and FDI stock are found to be positive and statistically significant. However, exchange rate is found to have no influence on the Foreign Direct Investment. GDP growth indicates market expansion. Various studies have employed different proxies for measuring market size; however, almost all studies have evidenced the positive link between market size & FDI. Openness

has the greatest impact in attracting FDI. Higher FDI stock gives the sense of the good business of earlier investment. Past FDI inflows signify the presence of multinationals in the host, reflects business prospect and also a proof for the earlier success story of multinationals. A better past record of capital inflow will increase present FDI flow.

Taking about the regime-dependent variable GDP per capita at PPP is found to be negative in both the regimes. However, the magnitude is low in the second regime. Macroeconomic uncertainty is found to have negative influence in the first regime. In a study on developing countries, Hausmann and Gavin (1995) also find a negative relation between an index of macroeconomic volatility and investment. Darby et al. (1999) by measuring separate real exchange rate variability for five OECD countries find negative link with investment either in the short-run or in the long-run or both.

In the second regime, the influence of macroeconomic uncertainty on FDI disappears. Countries below the income threshold level likely to suffer capital inflow if macroeconomic uncertainty prevails in the concerned economy. Once countries surpass a certain income level due to other favorable factors the negative impact of macroeconomic uncertainty vanishes.

Chapter-5

Summary and Conclusion

5.1. Summary, Findings and Conclusion

The motive of attracting foreign fund is still intact but the focus is more towards the stable form of capital instead of the short-term capital inflow in the form of Foreign Portfolio Investment. Policy maker and economic thinker are looking forward to taking measures in order to ensure a greater flow of foreign direct investment which is stable and productive in nature. FDI being a productive and secure source of international capital can play a more vibrant role in the process of global development.

Multinational Enterprises diversify its risk simply by setting up the subsidiaries in the growing economies and in the countries where input cost is minimal. Many developing countries have emerged as a new production hub for the multinationals mostly in recent years. The favorable market condition of developing economies is an incentive for the multinationals to set up business.

This study is an attempt to find out the role of macroeconomic factors in boosting the FDI towards host country. There are different motive behind the MNC's move to spread out its business activity. There are different approaches that explain why there is capital flow from one part of the globe to another.

First of all, the focus is on the detailed discussion of the FDI inflow into developing countries. For a detailed analysis, FDI inflows into developing countries are compared with the developed countries. FDI inflow figure from 1990 to 2014 reveal the fact that

there is a continuous rise of FDI towards developing countries. However, during the period FDI flow towards developed countries is not that smooth. To make the relative comparison more meaningful index of FDI flow is calculated with 2010 as the base year. Since 2010, FDI flow index of the world and developed countries have shown ups and down. Rising trend can be observed from the FDI stock figure of the world, developed countries and developing countries.

The share of developed and developing countries out of the world's FDI flow has experienced tremendous change. The share of developing countries reached 55.47 percent in the year 2014 from a mere 16.89 percent in 1990. Accordingly, the share of developed countries came down from 83.07 percent in 1990 to 40.61 in 2014. So over the years, FDI flow to developing countries has gained momentum.

For developing countries, FDI flow in percentage of Gross Domestic Product was 0.88 in 1990 and subsequently rose to 2.61 in 2014. For developed countries, the share of FDI in percentage of Gross Domestic Product was 0.94 and reached to 1.09 percent in 2014.

FDI flow to developing countries is further classified on the basis of continents and geographical location. Developing countries of Asia has the largest share followed by the developing countries of America.

What can be concluded from the analysis is that developing countries have become the most favored destination for Foreign Direct Investment. FDI share of developing countries has gone up where the share of developed countries has come down.

Moving on, the study assesses the impact of macroeconomic uncertainty on FDI in developing countries. To represent developing countries, 28 developing countries are included in the study.

In the second objective of the study macroeconomic uncertainty is measured. Macroeconomic uncertainty not only creates production disadvantage in terms of future expected return but also deter FDI if concerned multinationals aim at diversification of risk by operating at a different location or at a different country. The exchange rate is the most important macroeconomic variable associated with FDI. Cross country investment is believed to be largely influenced by exchange rate movement. Hence to measure macroeconomic uncertainty, conditional variance of the exchange rate is taken as the proxy. Conditional variance of the exchange rate is estimated separately for each country.

ARCH (GARCH) econometric technique is used to measure the conditional variance of monthly change of REER index. Mean equation is estimated by an Autoregressive-Moving Average (ARMA) process. Monthly ARCH (GARCH) variance series is averaged yearly so as to fit with the annual series. Apart from some countries, GARCH (1,1) is found to be the better model in measuring exchange rate uncertainty. Before moving into the ARCH (GARCH) estimation the stationarity property of each time series is tested with the help of Augmented Dickey-Fuller (ADF) Test. Each exchange rate change series is found to be stationary at level at one percent level of significance. The lag length of ADF test is determined with help of Schwarz Information Criterion (SIC) criterion.

Theoretically there are different contrasting arguments regarding the impact of uncertainty on investment. Theoretical analysis of Dixit (1989) and Dixit and Pindyck (1994) have emphasized on the role of uncertainty in investment decision. Exchange rate uncertainty alters terms of trade and may decrease FDI. A negative relationship between FDI and exchange rate uncertainty is expected if the motive of investment to serve other market. However, if the motive of FDI is to diversify location of production it is likely to have a positive relationship uncertainty and FDI (Blonigen 2005).

Several works on the relationship between exchange rate uncertainty and FDI are largely concentrated on developed economies (see Solomon and Ruiz 2012). Studies on developing economies that uncover a negative link between exchange rate uncertainty and FDI are Sung and Lapan (2000), Bennassy-Quere et al. (2001), Lemi and Asefa (2003) & Ruiz and Pozo (2008).

To ascertain the impact of macroeconomic uncertainty and other macroeconomic variables on FDI inflow in developing countries panel data technique is used. Panel data estimation has several advantages over time series and cross-section econometric estimation. Apart from potential macroeconomic variables FDI stock is also included as an explanatory variable. The use of FDI stock instead of lag dependent variable which is the net FDI has econometric significance. Panel data specification suffers from the problem of simultaneity if the lag dependent variable is used as an independent variable. The influence of explanatory variables on inward FDI may not be instantaneous. Since the implementation of FDI proposal involves time,one year lag of each explanatory variable is considered for the econometric estimation.

To assess the impact of explanatory variables on FDI, non-dynamic panel estimation is used. First of all, the analysis tries to find out the presence of the number of threshold value. GDP Per capita at purchasing Power Parity is the threshold variable. Relying on the Hansen's (1999) non-dynamic panel estimation presence of single threshold value is confirmed. This study has made use of "pdR" package in "R" which is a modified econometric estimation of Hansen (1999). This package allows incorporating more than one regime dependent variable in the panel estimation.

The whole sample is divided into different regimes depending on the threshold variable with respect to threshold estimate**.**

Among the regime-independent variables GDP growth, trade openness and FDI stock are found to be positive and highly statistically significant. Studies of Frenkel et al. (2004), Busse and Hefeker (2007) &Ang (2008) also find a positive link between GDP growth of the host country and FDI flow.

Trade in general, generate favorable investment environment through positive externality. Positive link between trade openness and FDI is also the finding of Al Nasser (2007), Torrisi et al. (2008), Ang (2008) & Solomon and Ruiz (2012).

Among the regime-independent variables, the exchange rate is found to have no impact on the FDI. Study of Arbeláez and Ruiz (2013) also find no influence of exchange rate level on FDI. Cushman (1985) argues that appreciations of currency makes foreign investment cheaper than before and hence encourage FDI. However, this increases input cost, making the link between exchange rate and FDI indeterminate.

Trade openness is the most significant variable in influencing Foreign Direct Investment towards the host country followed by FDI stock and GDP growth.

GDP per capita at PPP and macroeconomic uncertainty are the regime-dependent variables of the study. Since the presence of single threshold value is found the whole sample is further classified into two regimes.

In the first regime both the variables have a negative influence on FDI. On the other hand, in the second regime the negative impact of macroeconomic uncertainty dies out.At times, when GDP per capita which is measured in PPP terms is below certain level, macroeconomic uncertainty is found to have a negative relationship with FDI inflow. However, when GDPPPP per capita crosses threshold level, GARCH variance is found to have no influence on FDI. The basic inference from this is that when per capita GDP of countries is not sufficient enough, uncertainty deters FDI. Among the studies that show macroeconomic instability reduces inward FDI are Amuedo-Dorantes and Pozo (2001), Baniak et al. (2005) &Renani and Mirfatah (2012). Multinationals focus on the long run return potential of a country and unstable macroeconomic scenario of the host country negatively affect the FDI decision.

However, once a host country reaches a certain level income, the negative impact of macroeconomic uncertainty dies out. In other words, macroeconomic uncertainty turns statistically insignificant at higher level of income. The inference from the finding is that the influence of macroeconomic uncertainty is largely based on the income level of the host country. A certain threshold level of income also signifies sufficient infrastructure and market potential which sets as minimum condition for the surge of capital flow.

5.2. Scope for Future Research

The study has explored the macroeconomic uncertainty and its impact on FDI inflow into developing countries only. Future research related to the FDI inflow into developing countries as compared with developed countries may contribute to the economic literature. Measuring macroeconomic uncertainty remains to be an important issue empirically. However, it would be ideal to include various macroeconomic variables to measure macroeconomic uncertainty.

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