IMPACT OF FOREIGN DIRECT INVESTMENT ON ECONOMIC GROWTH: A STUDY ON BRICS NATIONS

By

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Submitted in fulfilment of the requirements of the degree of
DOCTOR OF PHILOSOPHY
to the

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SHAHBAD DAULATPUR, MAIN BAWANA ROAD
DELHI-110042 (INDIA)

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CANDIDATE'S DECLARATION

I, hereby certify that the thesis titled "Impact of Foreign Direct Investment on Economic Growth: A Study on BRICS Nations" is submitted in fulfilment of the requirements for the award of the degree of Doctor of Philosophy is an authentic record of my research work carried out under the guidance of Dr. Archana Singh. Any material borrowed or referred to is duly acknowledged.

The matter presented in this thesis has not been submitted elsewhere in part or fully to any other University or Institute for the award of any degree.

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SUPERVISOR'S CERTIFICATE

This is to certify that the thesis titled "Impact of Foreign Direct Investment on Economic Growth: A Study on BRICS Nations", submitted in fulfilment of the requirements for the award of the degree of Doctor of Philosophy is an original research work carried out by Ms. Priya Gupta, under my supervision. The matter presented in this thesis has not been submitted elsewhere in part or fully to any other University or Institute for the award of any degree, to the best of my knowledge.

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Balihari Guru Aapne Jin Gobind Diyo Bataye"

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PRIYA GUPTA

ABSTRACT

Over the past three decades, the world economy has witnessed an increasing trend of global economic integration. It has seen an escalating internationalization with expanding levels of cross- border trade and growing volume of foreign investment flows, direct investment in particular. However, the impact of this globalization has not been uniform across sectors, regions and countries. Some regions and countries have been able to get more intertwined with the world economy and as such have witnessed ever increasing magnitudes of Foreign Direct Investment (FDI) inflows, while others have been left relatively unaffected. The BRICS (Brazil, Russia, India, China and South Africa) nations are a notable example of such worldwide economic shift that is evolving today.

Based on the review of available literature and background of the study, the study aims to analyze the causal relationship between FDI and economic growth in Brazil, Russia, India, China and South Africa individually; to ascertain significant determinants (both economic and institutional) of FDI inflows in Brazil, Russia, India, China and South Africa individually; to estimate the most significant determinants impacting the FDI inflows in BRICS nations as a group and to examine the trends and patterns of macro- economic environment and institutional quality, challenges and future prospects of BRICS nations.

To fulfill the above mentioned objectives, the study has primarily employed Granger's Causality Test, Multiple Regression Analysis, Panel Data Analysis and Trend Analysis wherein only secondary data has been used (represented by both economic and institutional determinants respectively). The period used for the study covers more than three decades, i.e. 1983-2015 (except for Russia for which only 20 years are included because the data is available from 1995- 2015) to get a comprehensive view of the performance of BRICS on account of both the economic and institutional indicators. The collected data is analyzed with the help of software like EViews (Version 7.0), STATA (Version 12.0), SPSS (Version 21.0) and MS- Excel. After the econometric analysis on the secondary data, the study further conducts interviews with the policy makers (government officials at Ministry of Finance and Ministry of Commerce and Industry,

Government of India) as a part of primary data analysis to derive conclusive statements about the said objectives of the study.

The findings of the study suggest that it is indeed the economic growth that positively impacts the FDI inflows in the BRICS nations rather than the opposite. It is found in this study that the economic growth, that is represented by the economic and institutional determinants, has been successful in attracting FDI inflows over the years with the varied magnitude and significance levels) in Brazil, Russia, India, China and South Africa individually and commonly in the BRICS group. The study helps to address an intriguing question 'why should an MNC make FDI in BRICS' by identifying the strengths and weaknesses of each of the five countries. The study also contributes to the literature by identifying the factors representing the institutional quality of the BRICS nations along with the economic determinants.

The study has useful implications for the policy makers who can formulate their policies and strategies based on the identification of those areas where their country is leading and where it is lagging. The study also has relevance for the other emerging countries of the world that can follow the same path like BRICS and become the leaders in attracting FDI inflows in future.

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ABBREVIATIONS USED

ADF	Augmented Dickey Fuller
ASEAN	The Association of Southeast Asian Nations
BRICS	Brazil, Russia, India, China and South Africa
CIVETS	Colombia, Indonesia, Vietnam, Egypt, Turkey and South Africa
CLRM	Classical Linear Regression Model
CPI	Consumer Price Index
DIPP	Department of Industrial Policy and Promotion
DIS	Domestic Investment Section
ECB	External Commercial Borrowing
EG	Economic Growth
EV	Economic Variables
EViews	Econometric Views
FDI	Foreign Direct Investment
FE Model	Fixed Effects Model
FIPB	The Foreign Investment Promotion Board
FIU	Foreign Investment Unit
FTS	Foreign Trade Section
G-20	Group of Twenty governments and central bank governors from 20 countries
GDP	Gross Domestic Product
ICRG	International Country Risk Guide
IIAS	International Investment Agreement Section
IMF	International Monetary Fund
IPI	Industrial Production Index
IV	Institutional Variables
LDC	Least Developed Country
LM Test	Lagrange Multiplier Test
LPG	Liberalization, Privatization and Globalization
MINT	Mexico, Indonesia, Nigeria, Turkey
MNC	Multinational Corporation

NDB	New Development Bank
Next Eleven	Bangladesh, Egypt, Indonesia, Iran, Mexico, Nigeria, Pakistan, Philippines, Turkey, South Korea and Vietnam
OECD	Organization for Economic Co-operation and Development
OLS	Ordinary Least Squares
PIN	Pakistan, Indonesia, Nigeria
PRS	Political Risk Services
p-value	Probability Value
R&D	Research and Development
R^2	Coefficient of Determination
RE Model	Random Effects Model
REER	Real Effective Exchange Rate
SA	South Africa
SAARC	The South Asian Association for Regional Cooperation
SME	Small and Medium Enterprises
SPSS	Statistical Package for the Social Sciences
UNCTAD	The United Nations Conference on Trade and Development
USA	The United States of America
USD	US Dollars
VIF	Variance Inflation Factor
WDI	World Development Indicators

CHAPTER-1

CHAPTER: 1- INTRODUCTION

1.1 Introduction

Over a passage of last three decades, BRICS nations have emerged as the fastest developing economies of the world because of a continuously rising share in world's Gross Domestic Product (GDP); world trade; foreign exchange reserves; and FDI inflows and outflows. As per the latest World Development Indicators (WDI) data of 2015, issued by the World Bank, BRICS together represent over 3.09 billion people which account for almost half of the world's population; all five countries are among the top 25 countries of the world on account of population size, and four of them are in the top 10 (China at the top followed by India, Brazil and Russia). BRICS have a combined nominal GDP of 16.6 trillion US Dollars which is close to 22% of the gross world product and a combined foreign reserves level of 4 trillion US Dollars.

Jim O' Neill (2001) at Goldman Sachs developed the idea of the BRIC nations in his notable paper, "Building better global economic BRICs" when structural transformation was already taking place in these nations. Brazil was already working on bringing an economic stabilization plan to tackle the issue of very high inflation rates prevailing in the economy and also to boost privatization in the late 1980s. On the similar lines, India had introduced economic reforms, popularly known as LPG (Liberalization, Privatization and Globalization) in the beginning of 1990s. On the contrary, during the late 1990s, since China had emerged safe and sound from the Asian economic crisis, no such reform measures were visibly taking place in China whereas Russia was planning a strategic change to rebuild its lost economic status during this time.

Since the 1990s, persistent economic activities along with a focused strategy of growth resulted in major infrastructural and other favorable economic and institutional changes in the BRICS nations. These changes transformed BRICS nations into attractive destinations for capital inflows (especially in the form of FDI). It is also to be noted here that all the BRICS nations are not just developing or newly industrialized economies, but they are also classified as largest (in terms of surface area and population size) and fastest- growing economies. All these five countries have a major impact on domestic and global affairs discussed at the international platforms; all five countries are a part of the G-20 group.

These five countries also represent the largest continents of the world with their unique characteristics, i.e. Brazil represents the largest country in the South American continent; Russia, the world's largest nation (in terms of surface area) is a part of both European and Asian continent; India, the largest democratic and second most populated country in the world is a part of Asian continent; China, having maximum population in the world, is also a part of the largest continent of the world in terms of both size and population, i.e. Asia; and last but not the least South Africa which represents the African continent has the largest GDP per capita among all the regions (double that of Nigeria) and is the most attractive investment destination on the continent (because of advancements in the overall environment). The representation from all these continents brings together a lot of cultural and social diversities also due to which the consortium BRICS benefits more as compared to many such other economic blocs.

While lot of literature is available on the studies related to factors affecting FDI inflows and the relationship between FDI inflows and economic growth of nations, most of them focus on either the analysis of an individual country or are based on conceptual models formulated to analyze FDI inflows in developed countries of the world. However, the same can not be established whether the logic postulated in previous studies can be directly applied to FDI inflows in emerging economies like BRICS. Therefore, this study adds not just to the literature of FDI but also has significant implications for the policy makers and researchers dwelling upon this area.

The study starts by analyzing the theories available in the literature on international trade and economics to find out the reasons behind such capital flows and then how they can contribute to the economic growth of any nation. It is evident from these theories and literature that FDI is usually considered to be one of the most important reasons behind such strong economic growth of any country. Thus, to delve upon this claim, the study applies Granger's Causality test to identify whether it is FDI inflows that impacts the economic growth (measured by both economic and institutional determinants) of these five nations or is it vice versa. It is found after the analysis of first objective that it is indeed the economic growth (represented by both the economic and institutional determinants) which impacts the FDI inflows in BRICS. In furtherance of the findings of the first objective, the study attempts to find out the reasons behind such

causation between FDI inflows and economic growth in all the individual five countries and also in BRICS as a group. The study also conducts a deeper investigation on the trend analysis of both economic and institutional determinants of economic growth which in turn affects FDI inflows (country wise and period wise). All this analysis is conducted with an intention to help the policy makers in these countries who can do strategic decision making about those specific areas of concern only where their country is lagging (in terms of economic environment and institutional quality) and channelize the efforts of their Governments to become supreme powers in the world economy.

1.2 FDI

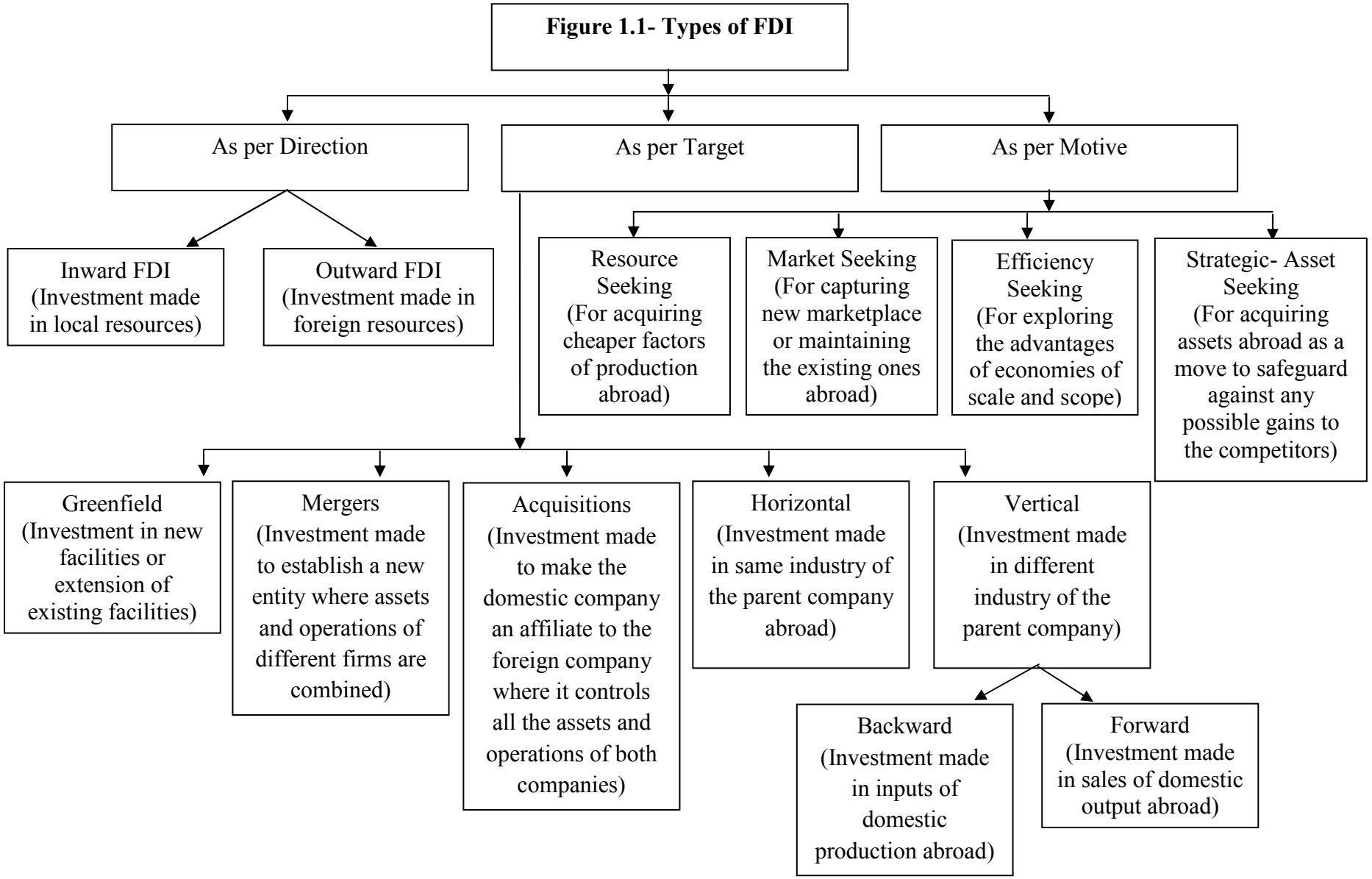
As per the benchmark definition of FDI issued by OECD (2008),

"Direct investment is a category of cross-border investment made by a resident in one economy (the direct investor) with the objective of establishing a lasting interest in an enterprise (the direct investment enterprise) that is resident in an economy other than that of the direct investor…the "lasting interest" is evidenced when the direct investor owns at least 10% of the voting power of the direct investment enterprise."

From the above definition and other available literature, it can be inferred that FDI is an important part of international capital movement. This phenomenon is due to the reason that FDI not only permits an organization in one nation to expand its business in another nation via establishing a subsidiary, but also allows to manage and control that business from a distance. During this expansion of business by setting up a subsidiary, though resources are relocated, yet the control is retained in the hands of parent company in the home country.

Since multinational firms engage in such capital transfers across the borders, it is important to understand the various alternatives available with them while they consider making investment decisions in another country other than the home country. The various types of FDI options are presented in a diagram below:

Figure 1.1- Types of FDI



1.3 Economic Growth

According to IMF, 1995, growth can be defined as

"Something that is sustainable, brings lasting gains in employment and living standards, and reduces poverty. It should respect human freedom and protect the environment."

Therefore to evaluate the performance of a nation, it is not the growth rate that is important, it is the quality of growth that is more important. Attaining high-quality growth is as a much a function of sound economic policies as implementing a broad range of social policies. Cypher and Dietz (2004) pointed out,

"Development is much broader than just income growth and implicitly incorporates the goals of economic, social and political dimensions of growth as well. Therefore, a comprehensive measure of development should include economic and social goals such as: a growth in income (as measured by overall GDP growth and per capita GDP growth, and real GDP growth) and living standards, equity in the distribution of income and wealth across gender, class, ethnicity, and religious beliefs; political democracy and participation; opportunities for women, minorities and all social classes to participate equally in economic, political, and social life; socio-economic conditions as reflected by opportunities for education and self-improvement irrespective of class, race, ethnicity or gender; availability of health care, public and private safety nets to protect the most vulnerable from extreme hardship, and a reasonably clean and healthy environment."

Usually, the performance of a nation is measured by its growth rate. Typically, economists use GDP growth rate or national income as a proxy to measure the overall growth of a country. However, development of a nation cannot be measured only by looking at its GDP growth rate. Development is a much more comprehensive term and the GDP growth rate is only part of several frontiers on which the growth/ development of a country can be judged. The overall economic growth, therefore, can be described as multi-faceted process of change and progress. Thus, a set of economic and institutional determinants are used in this study to represent the economic growth of these five emerging economies of the world.

1.4 BRICS

The acronym 'BRIC' was originally created in 2001 by Terence James "Jim" O' Neil in his notable research work in the report titled "The World needs better economic BRICs" published by Goldman Sachs to emphasize the outstanding role of these

economies. The research by him pointed out that all these four countries have common characteristics of rapid growth rate, very high economic potential and a demographic advantage which will place these economies in the top most position in the world forum. The original research paper and even later research on the subject did not spell out anything about the possibility that the term coined in 2001 by an economist would be formalized one day.

Various discussions were carried out for the institutionalization of BRICs during 2001- 2006; however, no concrete steps were taken in this matter. Series of meetings of the BRIC foreign ministers took place from 2006 to 2008 as side events to the UN General Assembly meetings held in these three years. Other meetings also took place during 2007- 08, which included the meeting of BRIC Heads in July 2008 and the meeting of Finance Ministers in November 2008. During the third meeting held in November 2008, all the four countries decided to develop co-operation among themselves on various spheres and in many ways. As per the agenda shared in this meeting, the common objective for BRIC group was "*building a more democratic international system founded on the rule of law and multilateral diplomacy."* However, all the four countries were asked to draw their immediate attention to lower the inflation rates on food prices and also to strengthen the overall international security, integrity and stability.

Beyond these informal meetings the BRICS group was institutionalized through summit meetings held as follows:

Table 1.1: Summary of BRICS Summits

Summit	**Participants**	**Date**	**Host Country**	**Leader of the Host Country**
1st	BRIC	16th June, 2009	Yekaterinburg, Russia	Dmitry Medvedev
2nd	BRIC	16th April, 2010	Brasilia, Brazil	Luiz Inácio Lula da Silva
3rd	BRICS	14th April, 2011	Sanya, China	Hu Jintao
4th	BRICS	29th March, 2012	New Delhi, India	Manmohan Singh
5th	BRICS	26th – 27th March, 2013	Durban, South Africa	Jacob Zuma

Summit	Participants	Date	Host Country	Leader of the Host Country
6th	BRICS	14th – 16th July, 2014	Fortaleza, Brazil	Dilma Rousseff
7th	BRICS	8th – 9th July, 2015	Ufa, Russia	Vladimir Putin
8th	BRICS	15th – 16th October, 2016	Goa, India	Narendra Modi
9th	BRICS	3rd – 5th September, 2017	Xiamen, China	Xi Jinping

The formalization of the group happened in 2009 when the leaders of the original four countries held their first summit in Russia. A clear objective behind the formalization of the group was spelled out during their first summit, "calling for a more democratic and multi-polar world based on the rule of international law, equality, mutual respect, co-operation, coordinated action, and collective decision making of all states". The youngest member of the group is South Africa who became a part of the group in 2010 creating the acronym as BRICS (Brazil, Russia, India, China, and South Africa). It was since then that the acronym "BRICS" is used to represent the collective power of these five economies.

The extent of power with South Africa is, however, somewhat different as compared to the original BRIC countries. It is because it does not possess all the characteristics of the original four countries in the group, i.e. it is not as large as the other four economies (As on 2015, in terms of surface area of these countries, Russia (the largest country in the world) is almost 14 times larger than the size of South Africa. All the four countries (BRIC) acquire the top 10 positions in the world as compared to South Africa which is at 24th position), it does not have strong growth rates (As compared to 1983, as on 2015, South Africa has grown with 263.65% in terms of its GDP which is much lesser growth as compared to Brazil (772.94%), India (833.65%) and China (4646.20%)), and the demand for a stronger political voice in international governance structures. As of 2015, China's GDP is almost 35 times higher than South Africa's GDP and India's GDP is almost 7 times that of South Africa. Both China and India have

almost 24 times larger population base than South Africa giving an idea about the market size of these economies and their growth potential.

BRICS are not among the most affluent countries of the world according to GDP per capita. In terms of GDP per capita (g.p.c) as of 2015, among the 189 countries of the world, Brazil is at 73rd position with USD 8538.59 g.p.c., Russia is at 67th position with USD 9057.11 g.p.c., India is at 145th place with only USD 1581.59 g.p.c., China comes at 76th rank with USD 7924.65 g.p.c. and lastly South Africa is at 93rd position with USD 5691.69 g.p.c. All BRICS are facing severe disparities.

In spite of all these heterogeneities among the BRICS, the study published by Goldman Sachs in 2003 "*Dreaming with BRICs: The Path to 2050"* is noteworthy here that predicted *"over the next 50 years, the BRICS economies could become super powers in the world economy"* and this is proven by the influx of capital that has been coming into these countries in past three decades. A summary of such capital movements is discussed in the next section.

1.5 An overview of FDI net inflows in BRICS countries

Table 1.2 below presents the total FDI net inflows (used as a proxy for FDI inflows) into BRICS by the host countries from the year 1983 to 2015 which is the period of this study (except for Russia, the period is taken from 1995 to 2015 for which the data is available). This period has been carefully chosen because of common availability of all the determinants selected for this study.

Table 1.2: FDI net inflows (US Billion $) in Brazil, India, China and South Africa (1983-2015); Russia (1995-2015)

Year	Brazil	Russia	India	China	South Africa
2015	75.07	6.48	44.21	249.86	1.57
2014	96.89	22.89	33.87	289.10	5.74
2013	80.84	70.65	28.15	347.85	8.12
2012	76.11	50.59	23.99	295.62	4.63
2011	71.54	55.08	36.50	331.59	4.14
2010	53.34	43.17	27.40	272.99	3.69
2009	31.48	36.58	35.58	167.07	7.62
2008	50.72	74.78	43.41	186.80	9.88

Year	Brazil	Russia	India	China	South Africa
2007	44.58	55.87	25.23	169.39	6.59
2006	19.38	37.59	20.03	133.27	0.62
2005	15.46	15.51	7.27	111.21	6.52
2004	18.16	15.44	5.77	62.11	0.70
2003	10.14	7.96	4.32	49.46	0.78
2002	16.59	3.46	5.63	49.31	1.48
2001	22.46	2.75	5.47	44.24	7.27
2000	32.78	2.71	3.58	38.40	0.97
1999	28.58	3.31	2.17	38.75	1.50
1998	31.91	2.76	2.63	43.75	0.55
1997	19.65	4.87	3.58	44.24	3.81
1996	11.20	2.58	2.43	40.18	0.82
1995	4.86	2.06	2.14	35.85	1.25
1994	3.07	0.69	0.97	33.79	0.37
1993	1.29	-	0.55	27.51	0.01
1992	2.06	-	0.28	11.16	0.01
1991	1.10	-	0.07	4.37	0.25
1990	0.99	-	0.24	3.49	-0.07
1989	1.13	-	0.25	3.40	-0.20
1988	2.80	-	0.09	3.19	0.16
1987	1.17	-	0.21	2.31	-0.19
1986	0.34	-	0.12	1.87	-0.05
1985	1.44	-	0.11	1.66	-0.45
1984	1.59	-	0.02	1.26	0.42
1983	1.61	-	0.01	0.64	0.07

Notes: 1. Own compilation based on data extracted from World Development Indicators 2016, World Bank (Accessed on 22-11-2016).

2. For ease of use, the term 'FDI inflows' will now be used throughout the thesis which means 'FDI net inflows'.

The table reveals that Brazil was a leader in attracting FDI flows till the early eighties. However, in the year 2015, the FDI inflows have fallen down from year 2014.

On the other hand, with the liberal trade regimes followed by the Chinese economy, the maximum FDI flows amongst all these five countries started flowing to China. It remains the leader in getting highest FDI inflows since 1985 to 2015. China's share in the total FDI inflows of BRICS is almost 66% in the year 2015 itself. But, if the trend of only last decade is seen, the growth made by the Indian economy is also noticeable i.e. 7.6% which is the maximum among these five countries. India also picked up its FDI inflows during the last decade which is almost six times from the year 2005, i.e. from USD 7.27 billion; it has reached to USD 44.21 billion in the year 2015.

In 1990s Russia attracted very low levels of FDI flows. In the beginning of 2000s, Russian economy could also see some positive movements in FDI flows when the oil prices across the globe were rising and economic activities were speeding up. During 2005 to 2008, FDI inflows were growing at consistently higher rate but this rate of growth in FDI reversed in 2009 when Russian economy had to face the global economic crisis. This year 2009 brought a downturn in the FDI inflows when it went down to twice as low as in 2008. With a steady growth rate and strong steps for the revival of the economy after the crisis, Russia could find an increase in FDI growth. The year 2013 proved to be a boon for the Russian economy's FDI inflows mainly because of the British Petroleum (BP) - Rosneft deal. However, due to the consequences of conflict with Ukraine, flood of new government sanctions, an inadequate investment climate and deteriorating economic conditions due to falling oil prices, in the year 2014, FDI inflows deteriorated 3 times as compared to 2013 (from USD 70.65 billion to USD 22.89 billion). This led to a situation when for the first time outflow of FDI stock became more than the inflow of FDI stock in the year 2014. The situation did not improve in year 2015 also, FDI inflows further reduced to USD 6.48 billion, as can be seen from Table 1.2 above, approximately 70% slump as compared to 2014 placing Russia at the second last place among BRICS economies (after South Africa).

South Africa, the youngest affiliate nation of BRICS group, has huge potential for attracting foreign investment; however, its past experience in terms of attracting FDI so far has been relatively poor. This is mainly because of the number of legislative uncertainties that discourage the foreign MNCs to invest. As a result, FDI inflows in South Africa were dropped sharply (73% down) in 2015 itself as compared to 2014 and

almost an 81% decrease from year 2013. In addition to infrastructural abnormalities in the electricity and logistics sectors, strikes in industrial units also badly affect the production processes which prove to be a disincentive for the investors. Still, due to new investments in infrastructure, FDI position has started to improve, though, at a slow pace.

With this background, the study attempts to determine the various factors influencing the FDI inflows in these countries over a long period of thirty three years (except for Russia for which the data was available from 1995). Also, the study throws a light on how this would channelize the efforts made by these economies in the right direction and enhance their efficiencies to become one of the supreme powers of the world.

1.6 Motivation behind this study

The prediction made by Dominic Wilson and Roopa Purushothaman at Goldman Sachs in their notable work in 2003 "*Dreaming with BRICs: The Path to 2050"* where they predicted that over the next 50 years, BRICS could become supreme powers of the world, has become the motivation for this present study. Due to this reason, the study not just attempts to find out the causal relation between FDI inflows and economic growth (measured by both the economic and institutional determinants) but also conducts an in depth analysis with respect to finding the specific determinants impacting the FDI inflows in all the individual five countries and also in BRICS as a group.

Along with the aforesaid objectives, the study has also conducted an elaborative analysis of the economic structures of these economies, the phases of economic development that they have gone through, the trends and patterns of their macro-economic environment, their institutional quality and the top five industries where FDI has come along with the strengths and weaknesses of these individual economies so as to find out how they (BRICS) have become the most attractive destinations in the world for foreign investors in the last three decades.

1.7 Relevance of the study

BRICS have shown higher growth rates as compared to even developed countries of the world, confirming to the prime objective for which these countries joined hands together. The prime objective, of these five countries, behind becoming a group was to enhance cooperation in trade and commerce, to increase their socio-economic and

political importance and to bring this group in the forefront in the world forum. As per the WDI published by the World Bank, as on 2015, 22% of the world's GDP is contributed by the BRICS with overall GDP level of USD 16.35 trillion. In terms of FDI net inflows also, BRICS account for 17.65% of the world's FDI net inflows.

As of 2015, among the 200 countries of the world, three of the BRICS countries are in the top 15 destinations of the world in attracting FDI inflows (China- 2nd, Brazil- 7th and India-13th) followed by Russia- 40th and South Africa- 76th. Among 189 countries of the world, in terms of absolute GDP levels, all five BRICS countries are among the top 35 positions (China- 2nd, India- 7th, Brazil- 9th, Russia- 12th and South Africa at 31st place).

These facts clearly indicate some correlation between the GDP levels and FDI net inflows in these countries and that is how this present study becomes relevant for the policy makers of these countries.

1.8 Current policy initiatives taken by the respective Governments in BRICS to motivate or restrict FDI

The present study not just analyses the strengths and weaknesses of each of the BRICS countries but also suggests some points to improvise the present situation. Thus, it is imperative to analyze the government initiatives also in their respective countries to motivate or restrict FDI. This would help the policy makers to do a gap analysis between what has been suggested by this study and what they are currently doing:

1. Brazil

Various initiatives have been taken by the Brazilian Government for promoting FDI for instance removing barriers to allow foreign investors particularly in the stock market, privatization of large number of public sector companies and deregulation of various sectors.

2. Russia

The Russian Government has still not been able to recover from the economic crisis and thus its investment assistance to various sectors is still in its nascent stage which is in the form of tax reductions and economic reforms. Still foreign investors have to take authorization from the government for holding any major foreign ownership in sectors like raw materials, heavy industries and aerospace.

3. India

The Indian Government is opening up gradually in its trade policies like it provides tax and non- tax benefits to foreign investors in specific sectors like electronics. It is also promoting its regional development by inviting foreign investors in the North-eastern regions, Himachal Pradesh and Uttarakhand. For the upliftment of the exporters in the economy and reducing the trade deficits, the Government also provides incentives for MNCs to establish their units in Special Economic Zones (SEZs), National Investment & Manufacturing Zones (NIMZs) and Export Processing Zones (EPZs). Along with these measures, the state governments in India are also allowed to provide additional investment incentives, which may include providing land at subsidized prices, giving soft loans to manufacturers, cheap availability of power, tax holidays, etc. The role of financial institutions in the Indian economy is also huge in promoting a culture of investment where nationalized development banks and industrial development banks run by state governments offer medium to long term financing facilities for new ventures at relatively lower interest rates.

Some more relaxations have been provided by the Government in its FDI policy like raising the foreign investment limit, lesser restrictions on modes of investment (i.e. allowing many sectors on the 'automatic route' as opposed to the earlier 'Government route', which required prior sanctions from the Foreign Investment Promotion Board (FIPB)). More investment in sectors like realty, private banks, defense, civil aviation, retail brands and news and information broadcasting is likely to be seen with such relaxations been granted by the Government. Moreover, foreign firms are now also allowed to invest in creating railway networks and supplying bullet trains. Newer policies of the present Government like Make in India, Digital India, and Skill India etc. are also some positive moves in promoting FDI.

4. China

The Government of China has a very clear policy of investment in which it has segregated the sectors where it wants to promote FDI and where it is prohibited. The sectors which are in need of FDI as per the Government are: advance technology, innovative equipment manufacturing, services sector, recycling of waste, clean and green production technologies, the use of renewable energies and environmental protection. On

the other hand, those sectors which already have a relatively strong production capacity and are in use of advanced technologies are prohibited for FDI.

In addition to the above policy, the Government of China also discourages foreign investment in sectors which are deemed to be keys for social stability, sectors where domestic firms are to be developed into globally competitive MNCs and sectors which are running wholly by the support of sanctions by the Government. The Government also prohibits investments in currency market and real estate where the intention of foreign investor is to make quick gains and indulge into speculative activities. Moreover, the Government has also strictly indicated that it plans to restrict FDI in resource intensive and highly pollution emitting industries.

5. South Africa

The South African Government after getting the status of a developing country is open to almost all the sectors for foreign investment. Least restrictions can be seen on how much FDI can invest in almost all the sectors of the economy and as such no prior Government approval is required for making such investments. Moreover, the Government has adopted various strategies to support foreign investments which include creating simplified tax protocols, providing investment benefits, clear policies on intellectual property rights' protection, etc. Some of these measures are listed below:

- The Foreign Investment Grant which is in the form of a cash grant provides reimbursement up to 15% of the total cost of new machinery and equipment bought;
- The Skill Support Programme is meant for foreign companies opening a subsidiary where the government sponsors up to 50% training costs of the workers and 30% of workers' salaries; and
- The Industrial Policy Project programme, which offers tax benefits to MNCs investing in specific industries which are in their nascent stage of growth.

Although the above measures are reflecting the open trade policy of the South African Government, yet the growth is not in the same proportion as in case of the other BRIC nations. This is because the process of economic recovery in South Africa has been slowed down due to recession, the private sector has limited exposure to create new

opportunities, and unemployment rates are among the highest across all the countries in the world.

1.9 Structure of the Thesis

The organization of the thesis is diagrammatically represented in Figure 1.2. The thesis contains eight chapters, each of which is introduced below:

Chapter 1: Introduction: This chapter of the study introduces the topic and further dwells with the background of the study, defines the terms FDI and explains the various types of FDI, defines the term economic growth and BRICS (Brazil, Russia, India, China and South Africa), the evolution of BRICS- from developing economies to emerging economies. It further discusses about the pattern of FDI inflows in BRICS countries, motivation behind the present study and also the significance of the study. The first chapter also highlights the current policy measures taken by the governments of all these five countries in promoting FDI. The chapter ends with the discussion on the structure of the thesis.

***Chapter 2: Literature review*:** This chapter begins by presenting an overview of the studies conducted in the past with respect to determinants of economic growth. It is followed by a section on the relationship of FDI and economic growth. The next portion of the chapter presents a detailed discussion on the various classifications of theories defining the reasons behind the FDI flows. The chapter further discusses the studies related to the determinants of FDI and segregates them into further sections related to economic determinants of FDI and non- economic/ institutional determinants of FDI. Both these discussions have been further conducted in four contexts each, i.e. specific developing countries, group of developing countries, specific developed countries and group of developing and developed countries. The last part of the chapter deals with a discussion on research gaps and need of the study.

Chapter 3: Research methodology: This chapter of the study discusses the research objectives and the research design used for the study. Research design of the study elaborates on the sample size, period, sources of data, determinants (dependent and independent) used and model specification. Further, this chapter provides the details about the methodological framework for analyzing the objectives of the study. This

includes a discussion about the statistical software used, hypotheses testing and the techniques applied to analyze these hypotheses.

Chapter 4: Causal relationship between FDI and economic growth in BRICS Nations: This chapter determines the findings for the third objective of the study i.e. whether it is FDI inflows that impact the economic growth in BRICS or is it vice versa. Thus, this objective is fulfilled by analyzing the cause and effect relationship between FDI and economic growth (measured by both the economic and institutional determinants) in the BRICS countries individually. Two models are created (one consisting of only economic determinants for thirty three years period (1983-2015), except for Russia 21 years (1995-2015) and second model consisting of only institutional determinants for 21 years for all five countries separately). Granger Causality test has been applied on both these models separately for each of the five countries of the BRICS.

Chapter 5: Determinants of FDI inflows in individual BRICS nations: This chapter tries to explore further the most crucial reasons for such strong/ weak/ no link between the FDI inflows and economic growth (as determined by the Granger Causality test in the previous chapter). It also finds out the magnitude and significance of such relationship (negative or positive sign of the coefficient value along with their p- values of t- statistics defining their significance). Multiple regression technique has been used along with the residual diagnostic testing to create the model of best fit for all the five countries.

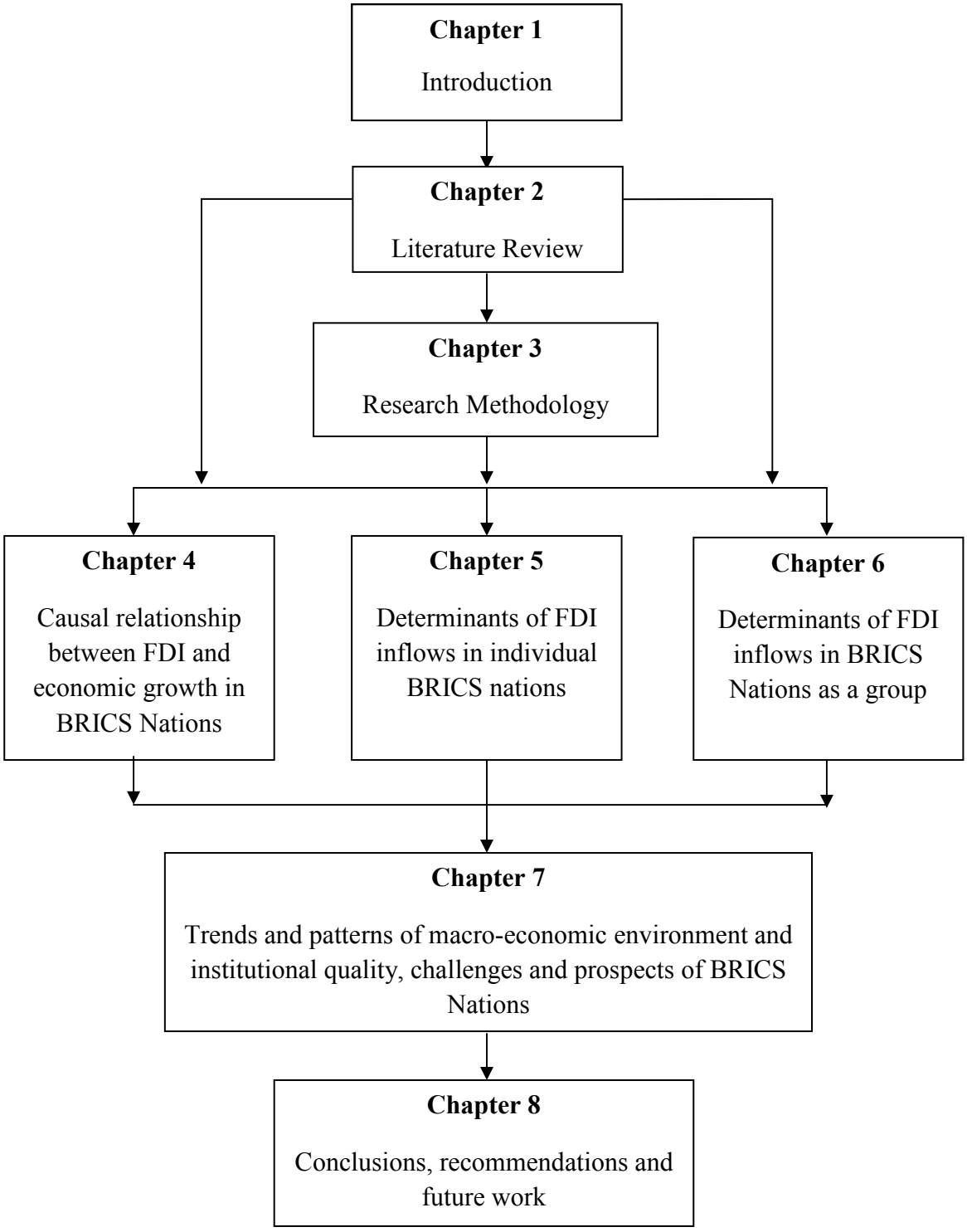
Chapter 6: Determinants of FDI inflows in BRICS Nations as a group: This chapter of the study analyzes the second objective of the study and it employs Panel Data regression analysis to find out the most significant determinants affecting the FDI inflows in BRICS group as a whole. To meet this objective, two models are developed and tested using all the three regression techniques available in panel data analysis i.e. Common Constant (Ordinary Least Square), Fixed Effects and Random Effects. The two models formulated to explore the determinants of FDI in BRICS countries over a period of three decades are: first model consisting of economic determinants only and second model consisting of institutional determinants only. Both the models are then tested for their residual diagnostics so as to find out a model of best fit.

Chapter 7: Trends and patterns of macro-economic environment and institutional quality, challenges and prospects of BRICS Nations: This chapter throws light on the

trends and patterns of macro- economic environment and institutional quality in all five individual BRICS countries and BRICS as a group over a period of more than three decades. This chapter further elaborates on the current structure of these economies and their phases of economic development to support the analysis conducted in the beginning of the chapter. After the aforesaid analysis, a comparative analysis of BRICS countries is also done in this chapter to address the question 'why should an MNC make FDI in BRICS countries?' by doing their strengths and weaknesses analysis. The chapter ends with the discussion on the prospects of BRICS countries as group.

Chapter 8: Conclusion, recommendations and future work: This chapter of the thesis lists all the conclusions pertaining to each of the objectives of the study. It also highlights the implications of the study from the view of policy makers of these countries and also globally, MNCs across the world and researchers. It also outlines some recommendations for the government bodies and policy makers of these countries so that they can channelize their efforts in attracting more FDI inflows effectively. The chapter concludes with the limitations of the study and describes the scope of future research in this area.

Figure 1.2 Structure of thesis



CHAPTER- 2

CHAPTER-2: LITERATURE REVIEW

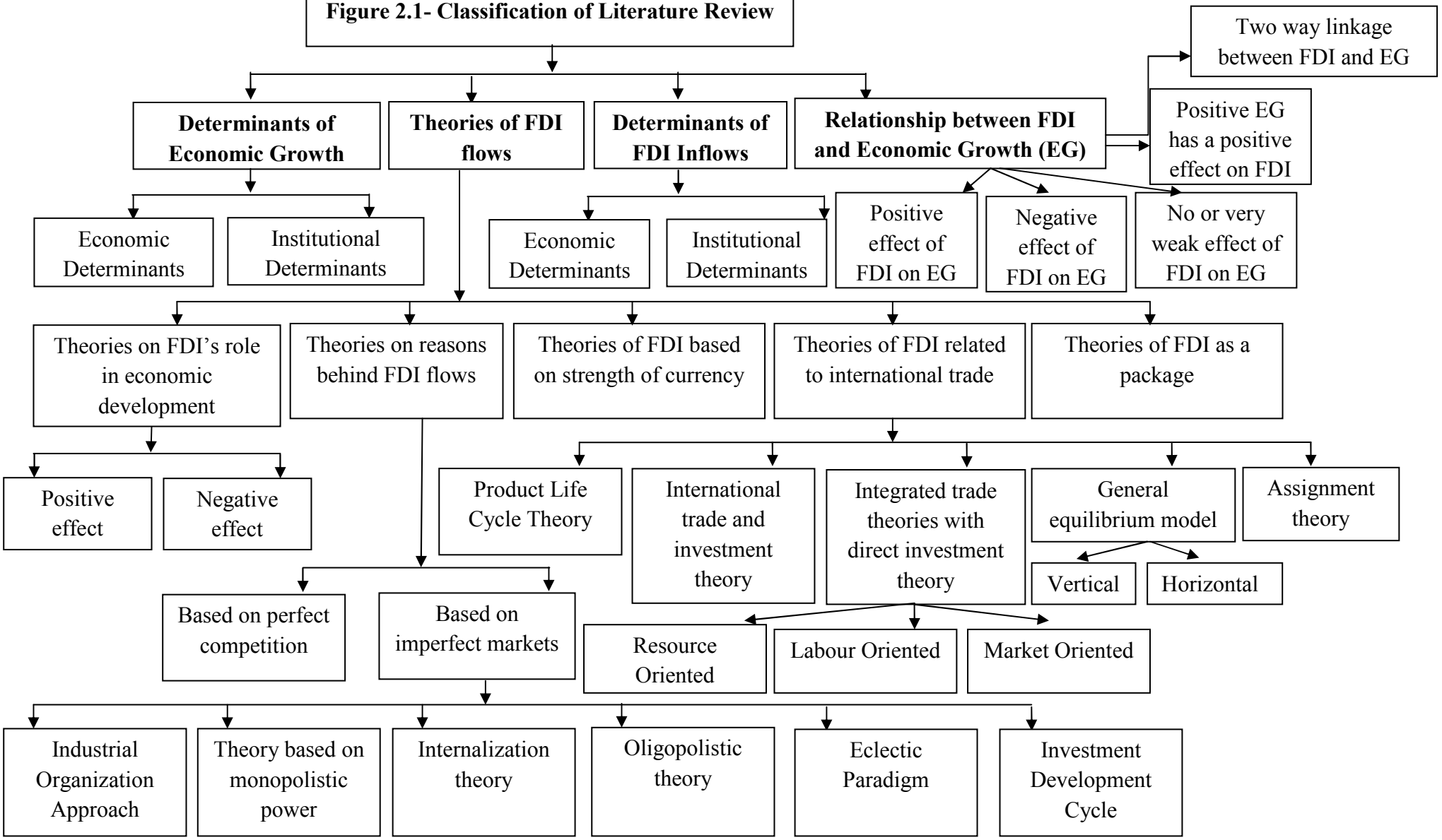
2.1 Introduction

"FDI is a driving force of globalization and an important engine of economic growth. Developing as well as developed countries seek to attract FDI due to its many advantages for economic development. FDI can not only bring capital to an economy, but also transfer knowledge, technology and skills, as well as generate employment and trade". (Jimmy J. Zhan, 2006)

A lot of research work has been accomplished in the past regarding investigation of all these aspects mentioned in the above definition related to FDI. Keeping in view the background of this study, literature review has been carried out under the following four heads (Figure 2.1):-

1. Review of literature on determinants of economic growth.
2. Review of theories about reasons behind FDI.
3. Review of studies related to the determinants of FDI inflows.
4. Review of existing work on the relationship between FDI and economic growth.

Figure 2.1- Classification of Literature Review



The detailed discussion of all the above classifications of literature, as pointed in Figure 2.1, is as under:

2.2 Review of literature on determinants of economic growth

Several researchers have analyzed the determinants of economic growth for individual countries or groups of countries that are part of emerging markets. Barro (1996) studied the determinants of economic growth for a group of 100 countries during the period 1960-1990. His research work reported that the growth rate is enhanced by *"higher initial schooling and life expectancy, lower fertility, lower government consumption, better maintenance of the rule of law, lower inflation, and improvements in the terms of trade"*. His study also pointed out that political freedom has only limited impact on economic growth. Arvanitidis et al. (2009) pointed out *"human capital, high technology, innovation and R&D, stable political environment, secure formal institutions (legal system, property rights, tax system, finance system) , good infrastructure, high degree of openness to trade, capacity for adjustment, specialization in knowledge and capital intensive sectors, significant FDI and free market economy (i.e. low state intervention)"* as the most significant determinants of economic growth in the context of group of developing and developed countries.

In some studies conducted on developing countries, authors like P. Upreti (2015) concluded that GDP growth rate, GDP per capita, export, government debt, natural resource yield, net foreign aid received, life expectancy, investment rate and FDI inflows are the significant factors influencing economic growth. Another study by R. C. Paudel (2014) pointed out that good governance, trade openness and coordinating infrastructure development are rather more important determinants for the growth of developing countries.

In a well known study on the group of developed countries by Petrakos et al. (2007), it was observed that it is indeed the drive for regional growth which proved to be significant for the economic growth in the European Union (EU). They found that regional economic growth is determined by *"the development level of regions, their capacity to invest in human and physical capital, their economic structure, their geographic position with respect to the EU market and their potential to exploit the positive externalities of agglomeration economies"*. Zhuang and Juliana (2010) found

that capital accumulation, as measured by education level of population, and trade liberalization are important factors of economic growth in 19 countries in the American subcontinent including the USA and Canada.

Everhart et al. (2009) examined the potential impact of corruption on economic growth in emerging markets. They reported that corruption negatively impacts accumulation of private capital and also has a negative impact on economic growth. Tridico (2007) concluded in his study on determinants of economic growth in emerging markets that it is the governance mechanism, level of exports, and human development factors that contribute positively to their growth.

In studies conducted on individual developing countries, authors like R. Adrogué, et al. (2006) proved that macroeconomic stability, economic reforms and lower government consumption in Brazil are the main reasons for the economic growth. Another study which supported these results was done in the context of Malaysia by Kogid et al. (2010). They found that in the short run economic growth is influenced by consumption expenditure, government expenditure, exports, exchange rates, and FDI. However, in the long run, consumption expenditure and exports cause growth in Malaysia. Ledyaeva and Linden (2008) examined determinants of short-run economic growth empirically in Russian regions during the period of 1996- 2004. They reported that general regional growth is impacted by financial crisis of 1998, domestic investments, and exports. Dewan and Hossein (2001) found that growth in labour force, investment in capital, low inflation rates, openness to trade and technological changes are the key factors behind the economic growth in Fiji. Dritsakis et al. (2006) pointed out in their study that it is FDI which Granger causes economic growth in Greece.

Some major studies conducted recently in the context of individual developing countries are by M. Seleteng and S. Motelle (2015) whose study was based on South African economy and it pointed out that *"inflation, government expenditures, openness to trade, human capital, level of financial development, and political stability"* are the significant for the economic growth. S. Biswas and A. K. Saha (2014) studied the determinants of economic growth of Indian economy and concluded that gross domestic capital formation, unemployment rate, export level, FDI and money supply have a positive effect where as inflation rate and fiscal deficit have a negative effect. A similar

study was conducted by M. J. Assbring in 2012 in the context of Chinese economy where it was found that high level of investments, household savings, level of GDP per capita, population growth, healthcare and education are the most prominent factors behind its economic growth.

Some of the economists have pointed out the macro- economic indicators as the factors impacting economic growth of a country whereas some others have highlighted the importance of non- economic variables/ institutional determinants as the most crucial factors impacting the economic growth. Therefore, based on the available literature, the present study takes into consideration almost 9 economic determinants and 10 institutional determinants (based on the availability of data uniformly for all the five countries in the BRICS group) which can represent the economic growth of these countries and thereafter test the cause and effect relationship between FDI and all these 19 determinants with the help of Granger's Causality Test.

2.3 Review of theories pertaining to reasons behind FDI

Post Second World War, FDI has played an important role in the international economic scenario. For understanding the causes behind such up trending movements in the FDI flows, one needs to investigate the various reasons that induce a company to invest abroad rather than indulging in merely exports or else outsourcing the production processes to domestic firms. There are many researchers in the past who have contributed to the literature providing newer evidences to explain the phenomenon of FDI flows (as shown in Figure 2.1), however, there is no agreement on a single approach or theory. Some of such theories are explained as under:

2.3.1 Theories on FDI's role in economic development

Major contributions in this area were made by eminent researchers like J. H. Dunning (1998, 1997, 1993, 1992, 1988, 1981, 1980, 1979, 1977, 1974 and 1971), S. Hymer (1976) and R.Vernon (1966). They all believe that FDI is an essential element in the overall economic development of any country. This theory was also well supported by Smarzynska (2002), Borensztein et al. (1998), Caves (1996), Blomstrom et al. (1994) and Findlay (1978). They argued that the rising FDI flows in the developing countries is even more important because it helps them not just in the generation of employment, higher productivity, increased competitiveness and technological development but also

leads to increased levels of exports, better access to the international markets, huge source of international financing and currencies.

Their point of argument was criticized by some researchers like Gorg and Greenwood (2002), Lipsey (2002), Hanson (2001) and Hirschman (1958) who proved that rather than improvising the situation, greater level of FDI flows may actually crowd out the domestic enterprises in the host country which in turn would lead to negative economic development.

2.3.2 Theories on reasons behind FDI flows

Further, there have been various FDI theories which are based on certain determinants explaining the entry mode of FDI. Some of these theories have been summarized as follows:

Prior to 1950s, FDI was considered to be part and parcel of Portfolio Investment only (Kindleberger, 1969) and it was believed that the reason behind this movement of capital flows was due to the differences in interest rates in various countries. Thus, interest rate arbitrage was regarded as one of the most important reasons for understanding the trends of capital flows between two countries. However, this theoretical underpinning laid out by the interest rate theory is not able to explain the basic difference between FPI (Foreign Portfolio Investment) and FDI.

A contradictory opinion to this theory was put forward by Hymer (1976) who asserted that making an investment abroad due to interest rate arbitrage does not compel an investor to exercise management control over that enterprise where he/ she has lend his/ her money. Thus, formulation of proper explanation of FDI became a hot topic of discussion during 1960s amongst researchers. Some of them explained that the imperfections existing in different markets is the reason for FDI flows while some others have opined monopolistic advantages as the prime motive for FDI flows.

Although there are various theories in the past that have explained the fundamental reasons for FDI flows across the countries, we have tried to explain some of the most important ones taking the research papers by V. Denesia (2010) and D. Nayak and R. N. Choudhury (2014) as base. **The classification of major theories discussed in the context of various developing and developed nations is as under:**

2.3.2.1 Theories of FDI based on perfect competition *(Credit theorists: MacDougall (1958), Simpson (1962), Kemp (1964), Frankel (1965), Pearce and Rowen (1966) and Caves (1971)):* The main emphasis of this theory is that in a perfectly competitive market, where there are no restrictions on the exchange of capital between two nations, the marginal productivity of capital gets equalized between the investing country and the recipient country. This tendency is also supported by the fact that the host country attracts more investment by **providing higher returns to the investment country** which in turn leads to a decrease in their (investing country) overall output. However, this is compensated by these higher returns and the national income of the investing country does not get reduced making it lucrative from them to remain invested.

2.3.2.2 Theories of FDI based on imperfect markets: The above theory has been majorly criticized by eminent researchers like Kindleberger (1969) who emphasized that if there is perfect competition existing between the two countries, there is hardly any possibility of capital flows between them. He further argued that there must be **some imperfections existing in the host country** so as to keep the foreign firm invested in the long run. Some of the eminent researchers who supported this proposition gave certain theories which are summarized as follows:

i. Industrial organization approach *(Credit Theorists: Lamfalussy (1961), Sodersten (1970), Caves (1974), Dunning (1974), Vaitsos (1974), Cohen (1975), Hymer (1976) and Graham and Krugman (1989)):* This approach laid emphasis on the fact that the host country's firms are in an advantageous position vis-à-vis the investing country's firms. This is because they have a better access and understanding about the culture, laws and preferences of consumers. Foreign players are also exposed to the foreign exchange risk along with other social and political pressures. Thus, it is inevitable for them to have certain **distinctive market powers to remain invested in the host country** in the long run. There are various ways, as suggested by this theory, in which their investment may remain profitable like having superior technology, strong intellectual property rights viz. brand names, patents, etc., excellent management and marketing skills, cheaper sources of finance and cost of production.

Although the above theory had a practical relevance in the international environment, yet it failed to explain where and when FDI should take place. This limitation encouraged the other researchers to find out ways to address these issues in the later theories.

ii. ***FDI based on monopolistic power*** *(Credit Theorist: Kindleberger (1969)):* Like the above theory, Kindleberger also proposed this theory based on **monopolistic power**. He explained the reasons behind the success of foreign players in the host country. According to him, better technological know- how, intellectual property rights, managerial and marketing skills generally encourage the foreign players to utilize them fully rather than sharing them with the domestic competitors in the host country. This is how their investment propositions remain profitable in the long run.

Kindleberger tried to explain different ways in which the foreign players may enjoy their monopolistic profits but he failed to explain which one the firms should focus the most. Also, another limitation of this theory lies in the fact that the monopolistic powers can be enjoyed by a foreign player only when the policy of the host country allows it to do so.

iii. ***Internalization theory of FDI*** *(Credit Theorists: Buckley and Casson (1976):* This theory provided another justification of FDI by laying emphasis on intermediate inputs and technology. The theory suggested that when a firm is involved in regular research and development activities, it has an advantage of creating an economic or innovative technology, process or input which it may utilize to reap profits in a country where it has got its subsidiaries. With the help of transfer pricing, the firm may be able to **internalize either backward or forward to reduce its overall transaction cost** (which would have been much higher, had it made a transaction with any unrelated firm). This generally acts as an incentive for that firm to operate in international market wherein output of its one subsidiary acts as an input for the other subsidiary's production. Similar possibility of profits can be generated with the help of transferring technology developed by one subsidiary to another subsidiary operating in other country. This

type of internalization involves operations in different countries which also mean indulging in FDI.

Like many other theories, this theory also has limitations. It ignores the fact that the host country government intervention may act as a very huge impediment in conducting such internalization processes and thus the MNC wanting to operate in various countries via this modus operandi might have to consider societal objectives parallel to its economic objectives.

iv. Oligopolistic theory explaining FDI *(Credit Theorist: Knickerbocker (1973)):* Oligopolistic market condition exists where there are small number of large players in specific industries. According to the existing economic literature, a firm may chose a location in a particular country for setting up its new facilities because of increased and easy access to local markets and utilization of abundant resources available at that particular location. Knickerbocker added another reason for such move by the firm i.e. **to match their rival's action**. This is also called as an imitative behavior by this firm as it doesn't want to lose on any strategic advantages. He argued that firms in an oligopolistic market follow other's location decisions. The idea behind his theory is that firms which are not sure about their production costs in the country, where they export, run the risk of being underpriced by a rival who has switched from exporting to rather setting up a new facility in the form of a manufacturing unit in the host country. By replicating the rival's action, the firm tries to avoid being underpriced in the foreign location.

The above proposition holds true only in the case of uncertainty where the firm doesn't know about the profits that may accrue to its rival by setting up its new facility there. However, if the conditions are known with certainty then there is no incentive to duplicate the rival's action. Further, another limitation of this theory is that it fails to explain the motive of the first firm to undertake FDI.

v. Eclectic Paradigm to FDI *(Credit Theorist: Dunning (1977, 1979 and 1993)):* Dunning added a new dimension to the aforesaid imperfect market- based theories viz. oligopolistic and internalization theories. His theory, also known as location theory, explains the reason why a firm opens a foreign subsidiary (Dunning, 1977

and 1979). He further enhanced his work in 1993 by putting forward a theory known as OLI Paradigm or Eclectic Paradigm. Dunning suggested that a firm would engage in FDI if the below three conditions are fulfilled:

a) It gets ***ownership*** **advantages** vis-à-vis other firms (O);
b) It seeks some ***location*** **advantages** in using a firm's ownership advantages in a foreign locale (L); and
c) It is advantageous to ***internalize*** rather than to use the market to transfer them to foreign firms (I).

He further elaborated that the ownership advantages are specific to a firm. These benefits, which may be enjoyed over the domestic and foreign counterparts, are in the form of possession of both tangible and intangible assets. Location advantages of different countries play a significant role in determining which country will be the host to the activities of the multinational enterprise. The internalization gains make it more profitable for a firm to carry out its transactions within itself i.e. with its subsidiaries rather than to depend on external markets.

The major contribution of this theory is that it combines various other market- based theories of imperfection. However, it was criticized by Dunning himself who accepted that the eclectic paradigm involves too many determinants, so much so, that it loses its operational relevance. The result of this criticism was the development of a new theory known as '**Investment Development Cycle or Path' theory** which introduced a new notion of dynamism to the eclectic paradigm. As explained by D. Nayak and R. N. Choudhury (2014) in their paper (pp. 11), "*Dunning (1981) initially proposed four stages of the development path, starting with pre-industrialization without any FDI. In stage II, as a result of government intervention, some location-specific advantages are created and inward FDI begins to rise. In stage III, domestic firms gain ownership advantage, and with higher wages inward FDI falls and at the same time outward FDI starts to rise. Countries in stage IV become net outward investors. In 1986, Dunning added stage V to explain the convergence and balancing of FDI stocks in most of the developed countries*."

2.3.3 Theories of FDI based on strength of currency *(Credit theorists: Aliber (1970), Caves (1988), Froot and Stein (1991) and De Mello (1997))*

The theories explained above focused on the market conditions as an important determinant behind attracting FDI flows to the host countries viz. perfect competition and imperfections in the markets. Unlike the above theories, this theory was initially proposed by Aliber in 1970 who explained the movement of FDI flows on the basis of strength of various countries' currencies. He found that "weaker currencies compared with **stronger investing country currencies had a higher capacity to attract FDI** in order to take advantage of differences in the market capitalization rate." He tested this theory in the context of major developed countries viz. the United States, the United Kingdom and Canada and found the results to be consistent with the theory postulated by him.

Although this theory was well supported by other researchers but it had its own limitations as this does not explain the investment pattern between two developed countries where the strength of currency is equal. Further, this theory's relevance is limited to only explaining the pattern of investment from a developed country to a developing country and not vice versa, i.e. investment from a developing country (weaker currency) to a developed country (stronger currency).

2.3.4 Theories of FDI related to international trade:

There are various researchers in the past who have contributed to the literature of international trade. Adam Smith (1776) gave the theory of absolute advantage which emphasized that "trade will emerge if one country has an absolute advantage in the production of one commodity and disadvantage in the production of another commodity". His theory lacked in explaining the fact that if there are no lines of production available within a country in which it is superior, then how the trade from these countries be explained. Thus, David Ricardo (1817) came with the theory of comparative advantage where he asserted that "that a country will specialize and export that commodity in the production of which it has comparative cost advantage and import that commodity in which its cost advantage is the least". Another popular theory was propounded by Heckscher (1919) and Ohlin (1933), i.e. the factor proportion theory where they stated that "countries would export goods and services that utilized greater quantities of their

relatively abundant factors, and import other goods and services (that is, those that were relatively scarce factors)".

All these above theories had a common assumption that the factors of production are immobile and can't be shifted from one nation to other and therefore, none of these theories were able to throw some light on how production can happen outside the national borders of a country. To answer this question, following theories came into existence and thus it becomes relevant to discuss them:

i. ***Product Life Cycle Theory*** *(Credit Theorist: Vernon (1966)):* This theory explained that in a competitive environment, FDI is nothing but an action to move out of the domestic markets where its own products are matured and also in the search of cheaper factors of production so as to sustain its market share.

   According to this theory, every product life cycle has following three stages:

   (a) ***Introduction stage****:* where a new product gets innovated and produced and there is a demand for such products in those countries where they have better purchasing power and skills. Gradually, when the product becomes successful in such wealthy markets, its production increases and new markets are catered with the help of exports.

   (b) ***Maturity Stage****:* Soon after the demand of the product rises in the foreign market, new competitors start to emerge in the foreign locations. To meet such rising demand, the original producer sets up a production facility in that location to compete with the rivals and fulfill the demand.

   (c) ***Standardization of product****:* In this last stage, the original producer tries to find out newer locations where the cost of production is least. The company producing this product sends it back to the original country of innovation (where the product was phased out) in order to boost innovation of another product.

   The above theory tries to explore the determinants of production, exports and foreign investment patterns of oligopolistic firms with the help of these stages of product life cycle. Cheaper source of capital, labour availability, innovation in technology and processes, product differentiation and managerial expertise are some of such key factors. However, this theory fails to explain why is it profitable

for an organization to undertake FDI decision rather than continuing to export from the domestic country or by providing license to a foreign firm to produce its products.

ii. ***International trade and investment theory*** *(Credit Theorist: Hirsch (1976)):* This theory tries to answer the above question of whether to go for FDI or to export or to provide license to foreign firm to produce domestic products at their foreign locations. It explains that the FDI takes place only in those countries where the MNCs get the incentive to produce (by setting up new plants) and sell its product with economies of scale, i.e. with cheapest inputs; they are able **to derive maximum profits** at those foreign locations

iii. ***Integrated trade theories with direct investment theories (****Credit Theorist: Kojima (1973, 1975, and 1985):* The main focus of Kojima remained on the investment made by the Japanese firms and he emphasized on following three orientations behind the indulgence of any firm in FDI:

(a) ***Resource- oriented or trade- oriented FDI****:* It happens when the domestic firm tries to increase imports of those goods that are expensive to be produced in the home country or when the domestic country lacks its inputs.

(b) ***Labour- oriented FDI****:* This is the investment which is targeted in getting advantage of cheap labour available for production at foreign locations.

(c) ***Market- oriented FDI****:* Such investments are made in order to capture a huge market with great potential. The intention is to even supersede the trade barriers between such countries so as to sustain in the long run.

One of the most important limitations of the above theory propounded by Kojima is that it lacks in explaining the modes of foreign investment, i.e. Vertical or Horizontal FDI.

iv. ***General equilibrium model of FDI:*** This theory highlights the important role played by the MNCs in international trade. It relates the international trade with the modes of FDI i.e. vertical and horizontal.

(a) ***Vertical FDI*** *(Credit Theorist: Helpman (1984)):* It refers to a situation where a firm in a home country invests in a production facility in host country in order to produce its inputs and bringing them back for further processing in

the country of origin. The other way to indulge in vertical FDI is to produce the inputs in the home country and then sending them to its subsidiaries so as to cater the needs of host country's market. Helpman emphasized on having a single production facility either in the host or home country with an assumption that there is an absence of tariffs and transportation costs between this parent country and the country in which the subsidiary is located. Therefore, as per his theory, there will never be a need for such firms to open more than one production facility and reap the benefits of being vertically integrated (choosing a cost minimizing location to maximize profits) at the same time.

(b) ***Horizontal FDI*** *(Credit Theorists: Helpman et al. (2003 and 2004)):* As per this theory, every industry is heterogeneous in nature on the basis of various productivity levels of firms in it. The theorists explained the organization of such firms along with their modes of operation in the foreign market in following three ways:

I. The least productive firms shut down as they cannot generate a positive operating profit, no matter how they are organized.

II. Other low-productivity firms sell either only in the domestic market. And even if they need to cater the needs of foreign market, they do it via exports.

III. The remainder of the heterogeneous firms will serve both domestic and foreign markets. In a way these are the most productive firms who decide to serve the foreign market via FDI. According to Helpman and others (2003 and 2004) "The firms that invest abroad will do so when the gains from avoiding transportation costs are greater than the costs of maintaining facilities abroad. This is called the proximity concentration tradeoff."

This general equilibrium model of FDI fails to explain the forms in which both Vertical and Horizontal FDI can take place, i.e. in the form of cross border mergers and acquisitions and Greenfield FDI.

v. ***Assignment theory of FDI*** *(Credit theorist: Nocke and Yeaple (2008)):* This theory assumed that the two countries can trade with each other freely, i.e. there are no transportation costs. They presumed that there are only two types of differences existing between the countries on the basis of which the FDI may take a form of either cross border merger and acquisition or a Greenfield FDI. They explained that if there are differences in the factor prices, then the countries will indulge in Greenfield FDI wherein the high- cost country will make an investment to a low- cost country by setting up a new plant at that location. On the other hand, if there are differences between the countries in the entrepreneurial abilities or some other assets then cross border acquisitions can occur from each country to the other to avail the benefit of complementarities.

2.3.5 Theories of FDI as a package

One of the popular and now-a-days widely accepted theories on FDI is that it is often considered or treated as a 'package'. *"It contains capital, but also is supposed to have a management, technology and skill content. It is supposed to provide access to international markets. Technical and management staff is trained at high levels at home and abroad, new equipment is designed, imported and adapted, and new practices are adopted."* [The idea of FDI as a 'package' was first floated by H. G. Johnson (1972) and was subsequently accepted by Kojima (1973, 1975 and 1985) and many others.]

A brief summary of the motives of MNEs to enter in a host country via FDI was also presented in the form of a "Universal Model" by Aristidis Bitzenis (2003). He mentioned that "the MNEs may enter into any country for seeking opportunities in new markets, to compete with their domestic and international counterparts as strategic market hunters, as factor hunters in search of raw materials, labour, managerial and organizational skills, etc. Further, the model highlighted that the firms may global as efficiency hunters, for exploiting locational and ownership advantages in the host country, for overcoming their imperfections and also because of some financial and political reasons."

From the above discussion, it is evident that there are various theories existing in the literature that explain the movement of capital from one country to the other. The main idea behind all these theories is that there could be varied motives/ reasons for firms

to invest abroad. There are certain theories that presume a perfect competitive market scenario whereas there are some others which conclude there must be some imperfections existing in the markets so as to attract more FDI flows. Therefore, it can be said that there is no single theory that combines all the assumptions and elaborates the reasons for such international investments. Despite all the contradictory approaches, some of the common motives highlighted by these theories are related to location, market access, labour availability, cheaper sources of finance, ownership and internalization amongst many others and this study is an attempt to understand the most applicable theory behind FDI inflows in BRICS by testing the proposed models empirically.

2.4 Review of studies related to the determinants of FDI

FDI is assumed to facilitate economic growth in emerging markets by providing innovative technological know- how, capital and access to diverse markets for the production of goods and services. However, attracting FDI is a major challenge for host countries as they need to identify the major push and pull factors that attract FDI to their countries. Some of the studies highlighting these factors have been summarized below:

2.4.1 Studies related to economic determinants of FDI:

There are several studies which have analyzed the economic determinants of FDI for individual countries or groups of countries that are part of developing or developed markets.

2.4.1.1 Studies in the context of group of developing countries:

In a study conducted by Harinder Singh and Kwang W. Jun (1995), only export orientation was proved to be a signal of country's growth that helps in attracting more FDI inflows. However, Marcelo Braga Nonnemberg and Mario Jorge Cardoso de Mendonca (2004) concluded that FDI is correlated to economy's degree of openness, inflation, risk and average rate of economic growth. Baker et al. (2008) highlighted stock market performance as the indicator for having more FDI inflows. Khondoker Abdul Mottaleb and Kaliappa Kalirajan (2010) also demonstrated that larger GDPs, higher GDP growth rates, higher proportion of international trade and a more business-friendly environment are more successful in attracting FDI. In a similar study, Recep Kok and Bernur Acikgoz Ersoy (2009) found total debt service, GDP and inflation as the crucial

determinants behind FDI inflows. Magda Kandil (2011) in a study on developing countries emphasized the role of exchange rate movements in attracting FDI flows.

Priya Gupta and Archana Singh (2013, 2014) also concluded in a very recent study on BRIC (which is an acronym commonly used to refer to Brazil, Russia, India and China) Nations that the most important factors for attracting FDI inflows are inflation rate, international liquidity, debt service as a percentage of export of goods and services of the country, current account as percentage of GDP, current account as percentage of export of goods and services, budget balance as a percentage of GDP and percentage unemployment in the country. Vijayakumar et al. (2010) concluded that market size, labor cost, infrastructure, currency value and Gross Capital Formation are the potential determinants of FDI inflows of BRICS. Another study in the context of BRICS countries was conducted by Ranjan and Agrawal (2011) who found that the most important determinants of FDI inflows in BRICS are market size, trade openness, labor cost, infrastructure facilities and macroeconomic stability and growth prospects. Market size and trade openness were also highlighted by Jadhav (2012) in his paper on BRICS countries.

2.4.1.2 Studies in the context of specific developing countries:

Boopen Seetanah and Sawkut Rojid (2011) emphasized on trade openness, wages and the quality of labor as the most instrumental factors for attracting FDI in Mauritius. Another study by Nguyen and Nguyen (2007) in the context of Vietnam gave importance to market, labor and infrastructure in attracting FDI. In the context of Nigeria, Ibrahim and Saidat (2008) and Obida Gobna Wafure and Abu Nurudeen (2010) highlighted the importance of market size of the host country, deregulation, political factors, and exchange rate regime for attracting FDI. A study on Ghana by Kyereboah- Coleman, A. and Agyire- Tettey, K. F. (2008) also proved exchange rate regime as an important factor for FDI inflows. De Angelo et al. (2010) concluded the importance of the consumer market and strength of consumer sales as the most important factor in explaining capital movements into Brazil.

A study in China by Owen C. H. Ho (2004) indicated that market size, wage rate, degree of economic reform and innovation activities are important determinants of sectoral FDI in China. Chien- Hsun Chen (1996) determined that market expansion

potential, labor cost, allocative efficiency, transportation linkages, and technological filtering are able to attract more FDI in the mainland China. Almost similar findings were postulated by Lv Na and W.S. Lightfoot (2006) who found that GDP that proxies for the market size, quality of labor and the degree of openness are the main determinants of FDI in China. Junjie Hong (2008) also emphasized the labor cost as an essential determinant for attracting FDI flows in China.

Muhammad Azam and Ling Lukman (2010) also revealed that market size, external debt, domestic investment, trade openness, and physical infrastructure are the important economic determinants of FDI in Pakistan, India and Indonesia. Balasundram Maniam and Amitava Chatterjee (1998) conferred the importance of exchange rate for attracting US FDI in a developing country like India. Monica Singhania and Akshay Gupta (2011) revealed that GDP, inflation rate, scientific research, and FDI Policy changes have had a significant impact on FDI inflows into India. The financial strength of the state, development level of the state, size of the market and level of infrastructure were some other determining factors for FDI in India as studied by Neerja Dhingra and H.S. Sidhu (2011). In a latest study conducted by P. Dua and R. Garg (2015), it was found that the depreciating exchange rate, higher domestic returns, higher domestic output and better infrastructure are the reasons for influx of FDI into India.

Elizabeth Asiedu (2002) suggested that good infrastructure, liberalized trade regimes and better government policies can help Africa to get more FDI flows. Elizabeth Asiedu (2006) concluded that natural resources and large markets promote FDI. Openness to trade, the size of the domestic market, stock of human capital played a positive role while political instability and labor cost a negative role in attracting FDI in the African markets as explored by Sawkut et al. (2009). There are few studies in the context of transition economies also like Yuko Kinoshita and Nauro F. Campos (2003) explored institutions, agglomeration and trade openness as main determinants for FDI inflows in such countries.

2.4.1.3 Studies in the context of group of developing and developed countries:

Andrew J. Abbott and Glauco De Vita (2011) in their study on OECD and non-OECD high income countries proved exchange rate regime as the most essential reason for high FDI inflows. For OECD member countries, Bertrand et al. (2004) concluded

both economic and institutional determinants as critical for having more FDI inflows viz. *"size and growth of the host market, government emphasis on financial incentives, economic policy, cultural closeness, costs of transport, materials and labor availability, technological know- how, political stability and good infrastructure facilities."*

2.4.1.4 Studies in the context of specific developed countries:

Andreia Alexandra Faria Severiano (2011) showed the importance of GDP per capita, degree of openness to trade, exchange rate, minimum wage, corporate tax rate and labor market flexibility while analyzing the determining factors for FDI in primary, secondary and tertiary sectors of Portugal. Another study which confirmed the results of the previous studies was by Gilmore et.al. (2003) who concluded that FDI is a preference to other forms of foreign market entry, size and growth of the host market, government emphasis on FDI and financial incentives, economic policy, cultural closeness, costs of transport, materials and labor, resources, technology, political stability and infrastructure are important determinants of FDI for Northern Ireland and Bahrain.

2.4.2 Studies related to non- economic/ institutional determinants of FDI:

2.4.2.1 Studies in the context of group of developing countries:

A study based on institutional determinants by Giuseppina Talamo (2011) revealed corporate governance and institutional quality as the most important factor of FDI. Belay Seyoum and Terrell G. Manyak (2009) concluded that public and private transparency can act as the strong reason for rising FDI inflows in developing countries. In another study on developing countries, Matthias Busse and Carsten Hefeker (2005) showed that a stable government, absence of internal conflict and ethnic tensions, basic democratic rights and a proper law and order mechanism leads to better FDI inflows. Alvin G. Wint and Densil A. Williams (2002) also supported stable government policies as a reason for having more FDI flows into the host country. Koji Miyamoto (2003) highlighted that an economy having a focused approach for human capital formation (i.e. by making both public and private investments on improvising the standard of living, education and health of man power) attracts more MNCs to invest their capital for long run in the form of FDI. Another perspective for attracting more FDI inflows in the host country was presented by Keith E. Maskus (2000) who stressed on the protection of intellectual property rights (IPRs) of the MNCs bringing not just capital but also

production technologies to the host country. He emphasized on the need of adhering to various multilateral agreements (like Multilateral Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)) to significantly strengthen the IPR regime in the host country.

2.4.2.2 Studies in the context of specific developing countries:

A study by Yi Hu (2007) concluded that higher literacy and education rates in China attract more FDI inflows. In the context of Pakistan, A. S. Rehman (2009) highlighted the importance of political stability and availability of energy to the MNEs to invite them to invest their capital for a long run. In a research on African countries, Jacob W. Musila and Simon P. Sigue (2006) emphasized on bringing economic reforms and policy changes in the host country so as to be a favorite destination of investment by MNCs. In addition to this, Elizabeth Asiedu (2001) said that by providing better infrastructural facilities and following liberalized trade regimes, host countries like Africa may attract more FDI inflows. Almost similar conclusions were drawn in the context of Russia by various researchers. In a study conducted by Jones et al. (2000), national infrastructure facilities and transparent government policies were cited as the most crucial determinants of attracting more FDI inflows. Another study by Andrey Popovich (2007) mentioned political risk as the most important deterrent towards bringing FDI inflows. Bergsman et al. (1999) in an earlier study on Russia also focused on having a more modern approach towards FDI, i.e. by following liberalized trade regimes to the maximum extent possible. The overall environment of a host country in terms of stable government policies, transparent law and order mechanism, better infrastructural facilities (e.g. energy, transportation, etc.) and a clear focus on education and health sectors makes a difference in bringing these developing countries on the top list of destinations attracting maximum FDI inflows.

2.4.2.3 Studies in the context of group of developing and developed countries:

Various studies have been conducted in the past that highlight institutional determinants as the critical reason behind higher FDI inflows. Jo Jakobsen and Tor G. Jakobsen (2011) suggested that a clear opinion of public and their preferences helps in the decision of MNCs of whether they should invest in a particular country or not in the context of non- OECD member countries. A similar opinion about democratic

participation of public was given by Matthias Busse (2003) for the developing and emerging market economies. Arshad Alam and Prabir K. Bagchi (2011) proved supply chain capability and government practices of the host country as the determinant of FDI inflows. However, Nitish Singh (2011) restricted his findings to only supply chain capability as the most crucial factor. Many researchers like David Floyd and Sandhla Summan (2008) in their study on Eastern and Western countries; Nauro Campos and Yuko Kinoshita (2008) in their study on Latin American and Eastern European countries and Bang Nam Jeon and Se Young Ahn (2004) in their research on Asian countries, have opined that the government policies related to a liberalized trade regime and an improved investment environment are required to act as pull factors for FDI inflows. There are various other factors that are extremely crucial for the MNCs to take a decision of investing their capital into the host country like country risk ratings (Vijayakumar et al., 2009) and public, private and corporate level transparency (Belay Seyoum, 2009) in the context of developing and developed countries. Robert W. Mc Gee (2003) conducted a comprehensive study on South East European countries for finding the essential reasons behind an upsurge movement in FDI inflows. He concluded that an overall transparent environment including a friendly business climate, taxation system, trade barriers, banking system, rules and regulations and corruption are some of such factors.

2.4.2.4 Studies in the context of specific developed countries:

According to Jose I. Galan and Javier Gonzalez-Benito (2001) availability and protection of intangible assets like intellectual property rights, lower transfer costs, easy knowledge transfer and accumulation, current and future markets and their expected growth are the most crucial determinants behind increased levels of FDI inflows in Spain. Some other essential factors behind the FDI movement were highlighted by M. Krishna Erramilli and Derrick E. D'Souza (1995) in their study on United States of America viz. internal and external uncertainties existing in the host country environment related to ethnic tensions, law and order mechanism, non- stringent rules and regulations, etc.

From the above literature review regarding potential determinants of FDI it can be seen that researchers have agreed about the impact of many determinants on FDI but still there is lack of uniformity on the influence of some determinants like inflation, exchange rate, openness, GDP, foreign exchange reserves, etc. on FDI inflows.

Some other determinants like international liquidity, gross capital formation, labour cost and availability, country risk ratings, etc. have not been researched much in the past and thus, this necessitates reinvestigation of all these factors influencing FDI inflows in case of BRICS nations.

2.5 Review of literature concerned with the relationship between FDI and economic growth

Various forms of FDI and technological developments during the recent times have played an important role in the process of integration of the developing economies with the rest of the world. This is visible in the paradigm shift in the preference of MNCs for investments in the developing economies as compared to the developed countries of the world. This in turn has led to an increase in the economic growth of such developing countries and making them as the most emerging nations of the world. This investment in the foreign countries other than the home country may be for resource seeking, market seeking or seeking cheaper labour force for reducing the cost of production and enhancing the economies of scale and scope. Thus, policy makers need to frame strategies to deal with such situation where the foreign capital flows become large so that the domestic producers do not get crowd out with such influx of investment. And at the same time, the impetus for growth also does not get disrupted with any disinterest developing in the minds of foreign investors due to the macro- economic environment and the institutional quality of these countries.

Therefore, it becomes imperative to have an understanding of the factors driving such flows and help the policy makers of these countries to make better and logical policies/ strategies to sustain their country's position in the longer run. Some of the researchers have shown empirical evidences for such relationships between economic growth and FDI inflows in the context of both developing and developed countries; a brief summary of such studies is presented below:

Table 2.1: FDI contribution to economic growth of the recipient countries

S. No.	Classification of the theories	Credit writer	Findings
1.	Endogenous Growth Models	Romer (1986, 1987); Lucas (1988, 1990);	FDI leads to significant contribution towards Human Capital which includes both the

S. No.	Classification of the theories	Credit writer	Findings
		Mankiw et al. (1992); Balasubramanyam et. al. (1996)	managerial skills and Research & Development that ultimately enables the **economies to grow in the long run.**
2.	Dependency School Theory	Stoneman (1975); Bornschier (1980); O' Hearn (1990)	• Developed nations become wealthy by extracting labour and other resources from Developing or under developed nations. • Developing nations are inappropriately compensated for their natural resources which lead to continuing poverty. • Capitalism is a reason for division of labour globally leading to distortion which in turn hinders economic growth and increases income inequality and therefore there is **negative impact on long term economic growth.**
3.	Neo- Classical Growth Models	Solow (1956); Ramirez (2000); Ram and Zhang (2002)	**Negligible long-run growth effects** due to: • Declining returns to physical capital • Huge outflows in the form of remittances of profits and dividends • MNCs obtain huge tax or non-tax incentives from the host country • Technology transferred by the MNC might be inappropriate for the host country • Highly restrictive policies on intellectual property rights • Excessive royalty payments and fees charged by the MNCs for the use of services

From the theoretical arguments discussed earlier, it appears that the debate of whether FDI inflows lead to increase in economic growth or act as deterrent to the domestic growth of the home countries remains largely an empirical question. A brief analysis of such studies is presented in this section:

2.5.1 Relationship between FDI and economic growth does not exist or is very week (supporting the neo- classical growth model): This is because most of the benefits are transferred back to the home country from where the MNC originated. Some studies that supported this school of thought were conducted by Singer (1950); Prebisch (1968); Griffin (1970) and Weisskof (1972). In the context of developing countries, Mansfield and Romeo (1980); Saltz (1992) showed the same results. Almost the same evidences were found in a research on 32 developed and developing countries by De Mello (1999) and by Mencinger (2003) for eight transition countries. Moon et al. (2011) revealed in their study on China that FDI has a stabilizing rather than an accelerating effect on a country's economy growth during both periods of crisis and recovery. Another study by Qazi Muhammad Hye (2011) on India also revealed that although long run relationship is present between FDI and economic growth but the rolling regression results revealed that FDI is negatively associated with economic growth in both long and short run. A study conducted by Miao Wang (2009) for the 12 Asian Economies also revealed that FDI inflows in non-manufacturing sectors do not play a significant role in enhancing economic growth. Some other examples of such studies are: Alam (2000) for Bangladesh; Akinlo (2004) and Ayanwale (2007) for Nigeria; Jarita Duasa (2007) for Malaysia and Pradhan (2002); Bhat et al. (2004) for India. Supravat Bagli and Manikal Adhikary (2014) in a very latest study on India also revealed that growth of FDI inflow is immaterial in the determination of the economic growth in India.

2.5.2 FDI has a positive impact on the economic growth (supporting the endogenous growth model): Some supporting studies were conducted by Bloomstorm et al. (1992) for 78 developing countries; Borensztein et al. (1998) for 69 developing countries; Marwah and Tavakoli (2004) for 4 ASEAN countries; and H. W. Mun et al. (2008) for Malaysia. Apergis et al. (2008) in their study on 27 Transition economies over the period 1991-2004 also concluded that FDI exhibits a significant relationship with economic growth. Another country specific study on Kenya by Kihiu and Moffat (2012) suggested

that FDI has a positive impact on economic growth through the interaction of human capital. Iqbal et al. (2013) also pointed out in their comparative study between India and China that both these countries have a positive relationship between FDI and GDP where more FDI inflows lead to a better economic growth of the countries which in turn also improvises their per capita income levels. A similar study on Nigeria conducted by Obiamaka Priscilla Egbo (2011) indicated that a causality relationship ran from FDI to GDP which means FDI leads to economic growth in Nigeria.

2.5.3 Higher economic growth leads to increased FDI inflows into host countries: This was revealed by Jackson and Markowski (1995) in the context of some Asian countries; and Chakraborty and Basu (2002) in the Indian context. Another study by Bianca Maria Ludosean (2012) on a higher grade developing country like Romania also concluded that FDI volumes do not initiate growth whereas economic growth proves to be an important factor in terms of attracting FDI in Romania.

2.5.4 Two ways linkage between FDI and economic growth: Hansen and Rand (2006) for 31 developing countries; Basu et al. (2003) for 23 developing countries; Bende-Nabende et al. (2001) for 5 ASEAN countries; and Liu et al. (2002) for China revealed a two way linkage between FDI and economic growth. Another study in the context of Portugal for the period 1977-2004 by Jorge and Rodrigues (2010) revealed that FDI fosters growth in the long-run while in the short-run there is a bi-directional causal relationship between FDI and growth. Sangita Dutta Gupta and Vishal Talwar (2012) in their study on India and some ASEAN countries found that there exists bidirectional causality between FDI and GDP for Malaysia, Philippines and India for the period 1980-2010. Srinivasan et al. (2011) pointed out in their study of SAARC nations that the empirical results of the vector error correction model exhibited a long-run bidirectional causal link between GDP and FDI for the selected SAARC nations except India. The VECM results showed that there is a one-way long-run causal link from GDP to FDI for India.

Thus, it can be seen from the above literature that there are various school of thoughts regarding the causality (both short-run and long-run) between FDI and economic growth, but these studies are either related to a single developing country or a group of developing countries like ASEAN and SAARC. Similar studies have also been

conducted in the context of developed group of countries like European Union. But, none of the previous studies have given attention to explore this causality in the context of the BRICS.

Therefore, the present study attempts to analyze this cause and effect relationship of FDI and economic growth (represented by both economic and institutional determinants) in the context of the BRICS by empirically testing their direction of causality. Along with this, the study also attempts to explore the most important economic and institutional determinants affecting the FDI inflows in the BRICS (both individually and as a group) by formulating various models with the help of chosen determinants (both economic and institutional) as per reviewed literature above.

The study is significant as it not just includes the macro- economic determinants in the model but also the institutional determinants which are based on the several types of risks faced by an economy. Thus, the overall models of this study are a comprehensive explanation for exploring the most crucial factors influencing the FDI decision of the foreign investors which in turn may or may not affect their economic growth.

2.6 Research Gaps

After reviewing the literature, it is seen that there are large gaps related to the studies on FDI and economic growth in the context of BRICS Nations. For simplification, the gaps are highlighted as:

- ***Firstly*****,** various studies have contributed to the literature on the impact of FDI on economic growth by taking real GDP growth rate as a proxy to economic growth. However, no study has taken any economic and institutional determinants representing the economic growth to make a comprehensive model for explaining the causality between FDI and economic growth. *This study is a contribution to literature in this matter.*
- ***Secondly*****,** there are several studies contributing to the literature on the determinants of FDI. However, all those studies have investigated for either the transition economies or developing economies or developed economies or for groups like ASEAN, SAARC and European Union using short time series of data. In the existing literature, research pertaining to BRICS countries is still limited. *This study fills this gap by analyzing the determinants of FDI not just for the BRICS as a group but also*

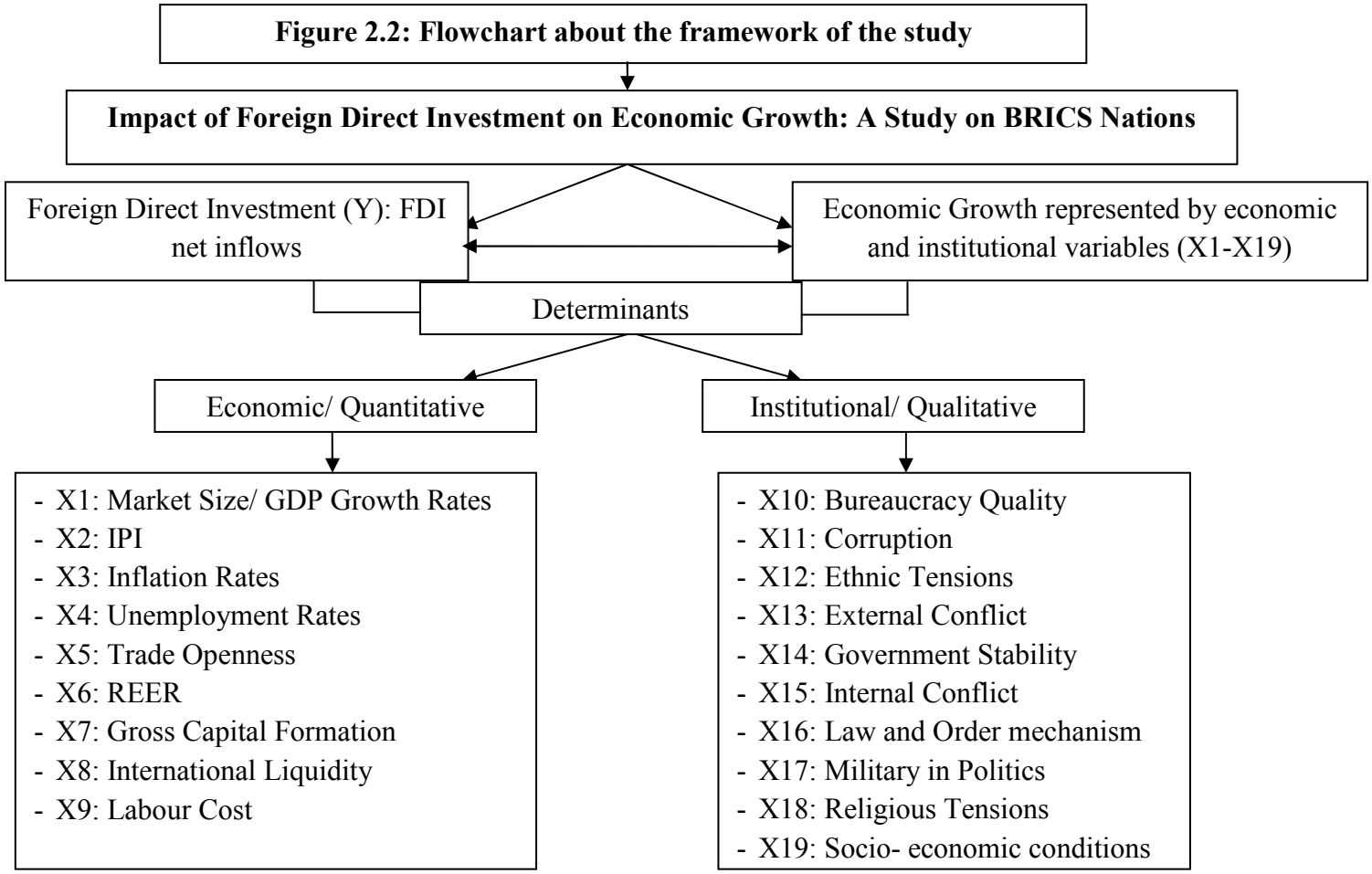
for the five individual countries of the group and that too for a long period of three decades.

- ***Thirdly,*** from the review of literature on the relationship between FDI and economic growth in the context of various developing and developed nations, it still appears that the debate of whether FDI inflows are growth- enhancing or growth- retarding. Moreover, in the context of BRICS economies, it still remains largely an empirical question. *Therefore, this study provides empirical evidences to address this issue and also gives recommendations to the policy makers of these countries in this regard.*

2.7 Framework of the study

Based on the literature review and research gaps identified in this study, the following figure (Figure 2.2) represents the framework of the study:

Figure 2.2: Flowchart about the framework of the study



CHAPTER- 3

CHAPTER: 3- RESEARCH METHODOLOGY

3.1 Introduction

This chapter of the study discusses the research objectives and the research design used for the study. Research design of the study elaborates on the sample size, period, sources of data, determinants (dependent and independent) used and model specification. Further, this chapter provides the details about the methodological framework for analyzing the objectives of the study. This includes a discussion about the statistical software used, hypotheses testing and the techniques applied to analyze these hypotheses.

3.2 Research Objectives

On the basis of the reviewed literature and the research gaps identified under the study, the study aims to achieve the following objectives:

1. *To analyze the causal relationship between FDI and economic growth of Brazil, Russia, India, China and South Africa individually.*
2. *To ascertain significant determinants (both economic and institutional) of FDI inflows in Brazil, Russia, India, China and South Africa individually.*
3. *To estimate the most significant determinants impacting the FDI inflows in BRICS nations as a group.*
4. *To examine the trends and patterns of macro- economic environment and institutional quality, challenges and prospects of BRICS nations.*

3.3 Research Design for the study:

3.3.1 Sample Size for the study:

The research work is conducted on five most powerful and fastest growing emerging countries of the world i.e. BRICS which stands for Brazil, Russia, India, China and South Africa.

3.3.2 Period of the study:

The data set of economic determinants consists of annual dataset from 1983-2015 (33 years) for the four emerging economies namely Brazil, India, China and South Africa and for Russia, the data is available from 1995- 2015 (21 years). The data set of institutional determinants consists of annual risk ratings which is available from 1995-2015 (21 years).

3.3.3 Sources of data for this study:

A. Secondary Data Analysis:

- *For economic determinants*- Since this study is based on extensive secondary data on International Financial Statistics, the authenticity of data is a prime concern. So, after reviewing a lot of literature, the data sources which were found to be reliable are: World Development Indicators published by World Bank; World Economic Outlook published by International Monetary Fund (IMF); Oxford Economics Annual Database and Bruegel Database.
- *For institutional determinants*- However, due to non- availability of data on institutional determinants in the earlier mentioned data sources, country risk ratings are used as a proxy (Malhotra et al. (2014), Savoiu et al. (2013), S. Popa (2012), S. Samara (2012), Basu et al. (2011)). The data on country risk ratings, measuring the institutional quality of these countries, is obtained from the International Country Risk Guide (ICRG) published by the Political Risk Services (PRS) Group, USA. The PRS Group, USA, founded in 1979, is largely used as the most authentic source by investment firms, colleges and universities, multilateral agencies like IMF, etc. The same data source has been used by Arbatli; David et al.; Kinoshita, etc. in 2011 in their respective research works conducted with IMF.

B. Primary Data Analysis:

Conducted with the help of structured interview (Appendix: II- Questionnaire for the interview of Government Officials) consisting of open- ended questions, conducted with the eminent policy makers presently holding offices in Ministry of Finance and Ministry of Commerce and Industry, Government of India.

- Under the Ministry of Finance, Department of Economic Affairs has an Investment Division from which senior level officials from Foreign Investment Promotion Board (FIPB) and Foreign Investment Unit (FIU) were interviewed regarding their opinion on the results derived empirically under this study.
- Further, interviews were also conducted from the officials from Department of Industrial Policy and Promotion (DIPP) which is administered by the Ministry of Commerce and Industry.

3.3.4 Variables used for this study:

The two most important variables in this study are the FDI inflows (represented by FDI net inflows in US billion dollars) and the economic growth (represented by both economic and institutional determinants). All these determinants are carefully chosen, based on previous literature and availability of dataset for the selected period. The detailed definitions and their measurement are reported in Table 3.1 as follows:

Table 3.1: Explanatory Determinants and their measurement

	Symbol	Determinants	Measurement
	Y	Foreign Direct Investment	Net inflows of FDI in Current billion US Dollars
Economic Determinants	X1	Market Size and growth prospects	GDP annual percentage growth rate
	X2	Industrial Production Index	Level of Industrial Production Index (IPI)
	X3	Inflation rates	Annual percentage of inflation rate as per Consumer Price Index (CPI)
	X4	Unemployment rates	Unemployment rates as percentage of total labor force
	X5	Trade Openness	Sum of exports plus imports of goods and services in current US Dollars as a percentage of GDP in current US Dollars
	X6	Exchange Rate	Real Effective Exchange Rate (REER) Index
	X7	Gross Capital Formation	Annual percentage growth rate of Gross Capital Formation
	X8	International Liquidity	Import Cover Ratio in number of months (measured as the proportion of foreign reserves in current US Dollars and imports of goods and services in current US Dollars)
	X9	Labor Cost	Net workers' remittances and compensation in US Dollars
Institutional Determinants	X10	Bureaucracy Quality	#Risk rating based on sub components: the institutional strength and quality of the bureaucracy. Maximum points: 4, Minimum Points: 0
	X11	Corruption	#Risk rating based on assessment of corruption within the political system.

	Symbol	Determinants	Measurement
			Maximum points: 6, Minimum Points: 0
	X12	Ethnic Tensions	# Risk rating based on assessment of the degree of tension within a country attributable to racial, nationality, or language divisions. Maximum points: 6, Minimum Points: 0
	X13	External Conflict	#Risk rating based on sub components: War, Cross-Border Conflict and Foreign Pressures. Maximum points: 12, Minimum Points: 0
	X14	Government Stability	#Risk rating based on sub components: Government Unity, Legislative Strength and Popular Support. Maximum points: 12, Minimum Points: 0
	X15	Internal Conflict	#Risk rating based on sub components: Civil War/Coup Threat, Terrorism/Political Violence and Civil Disorder. Maximum points: 12, Minimum Points: 0
	X16	Law and order	#Risk rating based on sub components: strength and impartiality of the legal system and popular observance of the law. Maximum points: 6, Minimum Points: 0
	X17	Military in Politics	# Risk rating based on assessment of threat of military take-over. Maximum points: 6, Minimum Points: 0
	X18	Religious Tensions	# Risk rating based on assessment of threat by a single religious group that seeks to replace civil law by religious law. Maximum points: 6, Minimum Points: 0
	X19	Socioeconomic Conditions	#Risk rating based on sub components: Unemployment, Consumer Confidence and Poverty. Maximum points: 12, Minimum Points: 0

Notes: 1. Own compilation based on extensive literature review.

2. #Extracted from the ICRG Methodology provided on http://www.prsgroup.com/ICRG_methodology.aspx where points are assigned by ICRG

editors on the basis of a series of pre-set questions for each risk component (accessed on 18-06-2016).

3. Maximum points of each risk ratings equates to very low risk whereas minimum points means very high risk.

3.3.4.1 Explanation of the Determinants:

FDI (Y): *Proxy- FDI net inflows:* Data on FDI flows are presented on net bases (capital transactions' credits less debits between direct investors and their foreign affiliates). Net decreases in assets or net increases in liabilities are recorded as credits, while net increases in assets or net decreases in liabilities are recorded as debits. Hence, FDI flows with a negative sign indicate that at least one of the components of FDI is negative and not offset by positive amounts of the remaining components. These are instances of reverse investment or disinvestment.

(A.) Economic Determinants:

(i) Market size and growth prospects (X1): *Proxy- Gross Domestic Product (annual growth rate %):* GDP growth rate has been taken as a proxy in this study for capturing the effect of increasing market size and growth prospects of these BRICS Nations because it considers the total of all economic activity in one country, regardless of who owns the productive assets and also because multilateral agencies like IMF also consider it as a better measure than GNP to analyze the world's economic growth. GDP represents the sum of value added by all its producers. Value added is the value of the gross output of producers less the value of intermediate goods and services consumed in production, before accounting for consumption of fixed capital in production.

A larger market size provides more opportunities for sales and also profits to foreign firms, and therefore attracts FDI inflows. So, the expected impact of the growing size of the market on FDI is positive (see Severiano, 2011; Singhania and Gupta, 2011; Dhingra and Sidhu, 2011).

(ii) Industrial Production Index (X2): *Proxy- Level of Industrial Production Index (IPI):* The Industrial Production Index (IPI) is an economic indicator that measures the real production output of manufacturing, mining and utilities sector. The exact coverage, the weighting system and the methods of calculation differs from one

country to another. It is a known fact that a better IPI would obviously mean an increased availability of output for both domestic sustenance and export. And thus, it is also expected that higher IPI would positively influence more FDI inflows in any economy (see Sridharan et al., 2009; Sahoo and Mathiyazhagan, 2003).

(iii)Inflation rates (X3): *Proxy- Annual percentage of inflation rate as per Consumer Price Index (CPI):* Inflation is measured by the consumer price index which reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals. There are two schools of thoughts with respect of impact of inflation on FDI inflows. One view is that an MNC would like to invest in the host country in case of higher inflation rates presuming to get better returns by selling its products at a relatively higher rate. This may happen because the market shows better demand prospects and a higher purchasing power in the hands of maximum part of population leading to greater producer surplus which acts as an incentive for the foreign investors. However, the other school of thought opines that the host country's government may bring changes in its fiscal and monetary policies to bring economic stability or controlling inflation which in turn may prove to be a disincentive for the foreign investors, i.e. it might compel them to disinvest their holdings and rather shift them to a more profitable avenue.

Another reason which usually discourages the foreign firms to invest in an inflated economy is that higher inflation leads to a fall in the value of money of the host economy. Such depreciation of host country's currency leads to increase in the relative wealth holdings of foreign firms and also reduces their cost of capital. However consequently, this phenomenon affects the foreign investors at the time of repatriation of their profits. Therefore, the flow of FDI into the host country declines. Hence, the expected relationship between the two is indeterminate (+/–) (See Gupta and Singh, 2014; Singhania and Gupta, 2011; Nonnemberg and Mendonca, 2004)..

(iv) Unemployment rates (X4): *Proxy- Unemployment rates as percentage of total labor force:* The unemployment rate is a measure of the prevalence of unemployment and it is calculated as a percentage by dividing the number of unemployed individuals by all

individuals currently in the labor force. During periods of recession, an economy usually experiences a relatively high unemployment rate.

With a higher rate of unemployment, it is expected to have very less FDI inflows as the people of the host country will have lesser or no purchasing power at all leading to decreased demand and thus acting as a disincentive for the MNCs to setup their industries in such countries. Thus, it is expected to have a negative relationship between unemployment and FDI inflows (see Gupta and Singh, 2014; Billington, 1999; Friedman et al., 1992; Coughlin et al., 1991).

(v) Trade openness (X5): *Proxy- Sum of exports plus imports of goods and services in current US Dollars as a percentage of Gross Domestic Product in current US Dollars:* Goods consist of merchandise imports and exports. Services cover transport, travel, communications, construction, IT, financial, other business, personal and government services, as well as royalties and license fees. This indicator measures a country's 'openness' or 'integration' in the world economy. It represents the combined weight of total trade in its economy, a measure of the degree of dependence of domestic producers on foreign markets and their trade orientation (for exports) and the degree of reliance of domestic demand on foreign supply of goods and services (for imports).

Much of FDI is export oriented and may also require the import of complementary, intermediate and capital goods. In either case, volume of trade is enhanced and thus trade openness is generally expected to be a positive and significant determinant of FDI (see Seetanah and Rojid, 2011; Severiano, 2011; Nonnemberg and Mendonca, 2004).

(vi) Exchange rate (X6): *Proxy- Real Effective Exchange Rate Index:* The real effective exchange rate (REER) is the weighted average of a country's currency relative to an index or basket of other major currencies, adjusted for the effects of inflation. The weights are determined by comparing the relative trade balance of a country's currency against each country within the index. This exchange rate is used to determine an individual country's currency value relative to the other major currencies in the index, such as the U.S. dollar, Japanese yen and the euro.

The effect of exchange rate movements on FDI flows is a fairly well-studied topic, although the direction and magnitude of influence are far from certain. Some researchers stated that a depreciation of the host currency should increase FDI into the host country, and conversely an appreciation of the host currency should decrease FDI. On the contrary, some other researchers claimed that appreciation of the host currency should increase FDI into the host country through increase in expectations of future profitability in terms of the home currency. Therefore, the expected relationship between the two is indeterminate (+/–) (see Severiano, 2011; Maniam and Chatterjee, 1998).

(vii) Gross capital formation (X7): *Proxy- Gross capital formation (annual growth rate %):* GCF is measured by the total value of the gross fixed capital formation, changes in inventories and acquisitions less disposals of valuables for a unit or sector. Gross fixed capital formation (GFCF) refers to the net increase in physical assets (investment minus disposals) within the measurement period.

It is observed that generally with the improvement in the investment climate, more foreign investors tend to route their investments in developing countries. This inflow of funds then enables the producers to manufacture better quality products leading to higher gross capital formation in these countries. On the other hand, because of cut throat competition among the developing countries for attracting more funds in their economies, a better investment climate might not lead to increase in gross capital formation at all. This is simply because each nation tries to make better sustainable strategies than other which ultimately leads to a marginal/ negligible change or even reduction in their gross capital formation. Such unclear relation between FDI inflows and capital formation also holds true in the context of BRICS, the most emerging economies of the world. Therefore, a positive or negative but significant relationship between FDI and Capital Formation is expected (see Vijayakumar et al., 2010).

(viii) International liquidity (X8): *Proxy- Import Cover Ratio (in number of months):* International liquidity measures as to how many months' imports can be covered by the foreign exchange reserves of a country. It is measured as the proportion of foreign

reserves in current US Dollars and imports of goods and services in current US Dollars.

Higher this number, the better it is for the country's financial health and thus better it is for attracting more FDI inflows. Thus, it is expected to have a positive and significant relationship between FDI inflows and international liquidity (see Malhotra et al., 2014; Gupta and Singh, 2014).

(ix) Labor cost (X9): *Proxy- Net workers' remittances and compensation in US Dollars:* It is measured as the difference between the workers' remittances and compensation, received (million US Dollars) and workers' remittances and compensation, paid (million US Dollars).

Higher labor cost would result in higher cost of production and is expected to limit the FDI inflows; therefore, negative and significant relationship between labor cost and FDI is expected (see Vijayakumar et al., 2010; Sawkut et al., 2009; Anh and Thang, 2007; Gilmore et al., 2003; Hong, 2008; Na and Lightfoot, 2006; Ho, 2004 in the specific context of China).

(B.) Institutional Determinants:

(x) Bureaucracy quality (X10): It refers to the institutional strength and quality of the bureaucracy in any country. This has a direct impact on the policy measures taken by a newly elected government. A high risk country usually faces traumatic changes in the policies as well as the administrative controls with the change in the government which in turn adversely impacts the foreign investors to operate in that country (see Malhotra et al., 2014).

(xi) Corruption (X11): Corruption is that evil in any economy which not just distorts the outer reputation of a country but also ruins the roots of that nation. It may exist in various forms in any economy distorting its financial environment leading to discontentment in the minds of foreign investors (see Malhotra et al., 2014).

(xii) Ethnic tensions (X12): This refers to the inherent tensions existing in any economy in terms of racial discrimination, nationality or language differences. This creates an unhealthy environment in which the MNCs from foreign countries might not like to operate (see Malhotra et al., 2014).

(xiii) ***External conflict (X13):*** It may exist in an economy in the form of foreign pressures for trade restrictions, withholding of aids and sanctions, threat of war or cross- border conflicts. This discourages the foreign investors to allocate their economic resources in such countries which are prone to such risks (see Malhotra et al., 2014).

(xiv) ***Government stability (X14):*** It is the measure of stability of the elected government and its commitment in implementing the policies declared by it in due course of time. A conflict from the opposition may dwindle with the position of the present government creating an unstable environment for not just the domestic companies but also for the foreign counterparts (see Malhotra et al., 2014).

(xv) ***Internal conflict (X15):*** This refers to assessment of any possibility of civil war, civil disorder or terrorism within the country leading to a situation of unrest in the economy. This obviously acts as a deterrent to the foreign investors to invest in such countries (see Malhotra et al., 2014).

(xvi) ***Law and order (X16):*** It measures the strength and impartiality of the legal system and also assesses the observance of law in terms of crime rate. Country having a strong judicial system attracts more foreign investment vis-à-vis a country having high illegal mechanisms in place (see Malhotra et al., 2014).

(xvii) ***Military in politics (X17):*** A threat of military takeover may represent a high risk as it is an indication that the government is unable to function effectively and therefore the country has an uneasy environment for foreign businesses (see Malhotra et al., 2014).

(xviii) ***Religious tensions (X18):*** This is the risk of a single religious group dominating the governance of the whole country. In other words, some inexperienced people trying to impose unnecessary policies through civil war leading to an uncertain investment climate and discouraging both domestic and foreign investors to remain invested in such countries (see Malhotra et al., 2014).

(xix) ***Socio-economic conditions (X19):*** These conditions encompass the basic problems at the root level in most of the developing nations. This includes poverty, unemployment, inequality of income, confidence of consumer in the market which

affects the individuals of the economy and the society at large (see Malhotra et al., 2014).

3.4 Methodological framework for Objective # 1: *To analyze the causal relationship between FDI and economic growth in Brazil, Russia, India, China and South Africa individually.*

3.4.1 Statistical Software used for this objective of the study:

E- Views Software (Version 7.0) and SPSS Software (Version 21.0) are used for applying the econometric techniques to test the first objective of the study.

3.4.2 Techniques used for this objective of the study:

Bi- variate Granger's Causality Test is applied in this objective. Following assumptions are checked before applying the appropriate technique for this objective of the study:

I. Checking stationarity: Before applying any econometric technique, all the selected economic determinants for the study have been tested for the presence of stationarity. This is because the time series data of economic determinants are often non-stationary or have means, variances and covariances that change over time. Hence, in the above case, stationarity has been checked for all the economic determinants using Augmented Dickey Fuller (Dickey and Fuller, 1979) (ADF) test by testing the following hypothesis:

H_0: There is a unit root i.e., the time series is non- stationary (reject the null hypothesis if p-value is less than 0.05)

If there is a presence of unit root then the data of economic determinants is transformed either by way of first/ second differencing or converting it into log differenced series (also known as growth series). However, in case of institutional determinants, country risk ratings have been used a proxy, therefore, no need to test for stationarity. This is because the ratings otherwise will lose their original identity and then implications can be drawn wrongly.

II. Identifying cointegration: Secondly, if the data series under study are found to be integrated in an identical order, Johansen's (1988) Cointegration Test can be employed to examine the long-run (cointegrating) relationship between the selected determinants. Once we identify a single cointegration vector among the selected determinants, VECM can be employed to establish the Granger causal direction.

On the other hand, if the determinants are not integrated of the same order, the pair wise Granger's (1969) bivariate causality is performed without including the error correction term. Granger's causality test is a bi-variate technique to check the presence of causality between determinants.

III. Checking and correcting multicollinearity: However, before using all the determinants in a single model, the problem of multicollinearity has to be checked. It is a statistical phenomenon in which two or more predictor determinants in a regression model are highly correlated, which may change the coefficient estimates erratically in response to small changes in the model or the data. The model with correlated predictors can indicate how well the entire bundle of predictors predicts the outcome variable, but it may not give valid results about any individual predictor or about which predictors are redundant with respect to others. This is measured by calculating a correlation matrix where Pearson's correlation coefficients are calculated. Pearson's correlation coefficient (r) measures the strength of linear association between two numerical determinants. It is calculated with the help of following mathematical formula:

$$r = \frac{1}{n-1}\sum \frac{(x_i - \bar{x})(y_i - \bar{y})}{s_x s_y} \quad \text{.....(1)}$$

Multicollinearity is said to be a problem if the *r* value of the correlation matrix is significant; if the variance inflation factor is greater than 1/ 1-R^2 and Tolerance value is less than 1-R^2. The R^2 is the outcome of auxiliary regressions where the regressors have been regressed with other regressors.

One important way to resolve the problem of multicollinearity is to reduce the number of collinear determinants until there is only one remaining out of the set. Drop those determinants whose VIF is more than 5 and Tolerance Level is lesser than 2 till the time all the VIFs of remaining determinants in the model are lesser than 5.

Based on the results of the correlation matrix, VIF and tolerance level, highly correlated determinants have been dropped and the remaining uncorrelated determinants are considered for the Granger's causality test.

IV. Granger's Causality Test: Once the problem of stationarity and multicollinearity are addressed, Granger's causality test has been applied. Using Granger's Causality test, the following specification has been formulated to establish bi- variate causality between

FDI inflows and each of the selected economic and institutional determinants (EV and IV) separately.

$$\mathrm{FDI_t} = c_1 + \sum_{i=1}^{m} \alpha_i \mathrm{FDI_{t-i}} + \sum_{j=1}^{n} \beta_j \mathrm{EV\&}IV_{t-j} + \mu_t \dots\dots (2)$$

$$\mathrm{EV\&}IV_t = c_2 + \sum_{i=1}^{p} \theta_i \mathrm{EV\&}IV_{t-i} + \sum_{j=1}^{q} \lambda_j \mathrm{FDI_{t-j}} + \varepsilon_t \dots\dots (3)$$

3.4.3 Hypotheses testing for this objective of the study:

The following pairs of hypotheses of the Granger's Causality test individually for each of the five countries for all the above mentioned specifications.

H_{01}: Y do not Granger Cause Economic and Institutional determinants (X1-X19)

H_{02}: Economic and institutional determinants (X1-X19) do not Granger Cause Y

Where, Y stands for the FDI inflows and X1-X19 stands for all the economic and institutional determinants.

3.4.4 Interpretation of Result Analysis- Pair- wise Granger's Causality Test:

Based on the estimated Ordinary Least Squares (OLS) coefficients for the equations (2) and (3) four different hypotheses about the relationship between Y and X1-X19 can be formulated:

1. Unidirectional *Granger-causality* from X1-X19 to Y. In this case any of the economic and institutional determinants increase the prediction of FDI inflows but not vice versa. Thus, $\sum_{j=1}^{n} \beta_j \neq 0$ and $\sum_{j=1}^{q} \lambda_j = 0$.
2. Unidirectional *Granger-causality* from Y to X1-X19. In this case FDI inflows increase the prediction of any of the economic and institutional determinants but not vice versa. Thus, $\sum_{j=1}^{n} \beta_j = 0$ and $\sum_{j=1}^{q} \lambda_j \neq 0$.
3. Bidirectional (or feedback) causality. In this, $\sum_{j=1}^{n} \beta_j \neq 0$ and $\sum_{j=1}^{q} \lambda_j \neq 0$, so in this case any of the economic and institutional determinants increase the prediction of FDI inflows and vice versa.

4. Independence between Y and X1-X19. In this case there is no *Granger causality* in any direction, thus $\sum_{j=1}^{n} \beta_j = 0$ and $\sum_{j=1}^{q} \lambda_j = 0$.

Hence by obtaining one of these results it is possible to detect the cause and effect relationship between FDI inflows and the economic growth of all the five countries in the group.

3.5 Methodological framework for Objective # 2: *To ascertain significant determinants (both economic and institutional) of FDI inflows in Brazil, Russia, India, China and South Africa individually.*

3.5.1 Statistical Software used for this objective of the study:

E- Views Software (Version 7.0), SPSS Software (Version 21.0) and STATA Software (Version 12.0) are used for testing this 2nd objective of the study.

3.5.2 Techniques used for this objective of the study:

Without disturbing the previous model tested with the help of Granger Causality test, the study now tries to go one step further and investigate the significance of other country specific determinants on the FDI inflows coming to the country. For this purpose, study has also tested two separated models of multiple regression for each of the five BRICS countries separately (one of all the nine economic determinants as independent determinants and the second one is of all ten institutional determinants as independent determinants and FDI inflows as the dependent variable in both the models).

Simple Ordinary Least Square (OLS) Regression Technique is applied on this annual dataset of thirty three years (1983-2015 for Brazil, India, China and South Africa whereas for Russia, the dataset is available from 1995-2015, i.e. for 21 years). The same technique has been applied by various researchers and is found useful for estimating the direction and magnitude of changes from various independent determinants to FDI inflows. Some of such studies were conducted by Hasli et al. (2014) in the context of China, Singapore and Malaysia; by Panigrahi and Panda (2012) for three countries India, China and Malaysia; by Azam and Lukman (2010) for India, Indonesia and Pakistan; and by Asiedu (2002) from the perspective of African countries.

The models specification for all the five countries individually is as follows:

MODEL I: Includes only economic determinants as independent variables and FDI inflows as the dependent variable.

$$Y_{it} = \alpha + \beta_1 X1_{it} + \beta_2 X2_{it} + \beta_3 X3_{it} + \beta_4 X4_{it} + \beta_5 X5_{it} + \beta_6 X6_{it} + \beta_7 X7_{it} + \beta_8 X8_{it} + \beta_9 X9_{it} + \mu_{it} \quad \ldots\ldots(4)$$

MODEL II: Includes only institutional determinants as independent variables and FDI inflows as the dependent variable.

$$Y_{it} = \theta + \lambda_1 X10_{it} + \lambda_2 X11_{it} + \lambda_3 X12_{it} + \lambda_4 X13_{it} + \lambda_5 X14_{it} + \lambda_6 X15_{it} + \lambda_7 X16_{it} + \lambda_8 X17_{it} + \lambda_9 X18_{it} + \lambda_{10} X19_{it} + \varepsilon_{it} \quad \ldots\ldots...(5)$$

In the above specification,

Y_{it} is net inflows of FDI for Country *i* at time *t.* This represents the dependent variable of the study.

The right hand side of the specification model includes all the independent determinants which are defined as follows:

α and θ are the intercept terms of the two models respectively

$X1_{it}$ is Gross Domestic Product for Country *i* at time *t.*

$X2_{it}$ is Industrial Production Index for Country *i* at time *t.*

$X3_{it}$ is Inflation Rates for Country *i* at time *t.*

$X4_{it}$ is Unemployment Rates for Country *i* at time *t.*

$X5_{it}$ is Trade Openness for Country *i* at time *t.*

$X6_{it}$ is Real Effective Exchange Rate used for Country *i* at time *t.*

$X7_{it}$ is Gross Capital Formation for Country *i* at time *t.*

$X8_{it}$ is International Liquidity for Country *i* at time *t.*

$X9_{it}$ is Labor Cost for Country *i* at time *t.*

$X10_{it}$ is Risk ratings for bureaucracy quality for Country *i* at time *t.*

$X11_{it}$ is Risk ratings for corruption for Country *i* at time *t.*

$X12_{it}$ is Risk ratings for ethnic tensions for Country *i* at time *t.*

$X13_{it}$ is Risk ratings for external conflict for Country *i* at time *t.*

$X14_{it}$ is Risk ratings for government stability for Country *i* at time *t.*

$X15_{it}$ is Risk ratings for internal conflict for Country *i* at time *t.*

$X16_{it}$ is Risk ratings for law and order for Country *i* at time *t.*

$X17_{it}$ is Risk ratings for military in politics for Country *i* at time *t.*

$X18_{it}$ is Risk ratings for religious tensions for Country *i* at time *t.*

$X19_{it}$ is Risk ratings for socioeconomic conditions for Country *i* at time *t.*

μ_{it} and ε_{it} are the stochastic disturbance terms of the two models respectively

β_{it} and λ_{it} are the slope coefficients of the two models respectively.

3.5.3 Hypotheses testing for this objective of the study (BRICS countries individually):

The following hypotheses have been formulated with the help of carefully chosen independent determinants (based on availability of data for the selected period of study):

H_1: Gross Domestic Product (GDP) does not have a significant impact on FDI inflows of Country *i* at time *t*.

H_2: Industrial Production Index (IPI) does not have a significant impact on FDI inflows of Country *i* at time *t*.

H_3: Inflation rates do not have a significant impact on FDI inflows of Country *i* at time *t*.

H_4: Unemployment rates do not have a significant impact on FDI inflows of Country *i* at time *t*.

H_5: Trade openness does not have a significant impact on FDI inflows of Country *i* at time *t*.

H_6: Exchange rates do not have a significant impact on FDI inflows of Country *i* at time *t*.

H_7: Gross capital formation does not have a significant impact on FDI inflows of Country *i* at time *t*.

H_8: International liquidity does not have a significant impact on FDI inflows of Country *i* at time *t*.

H_9: Labor Cost does not have a significant impact on FDI inflows of Country *i* at time *t*.

H_{10}: Bureaucracy quality does not have a significant impact on FDI inflows of Country *i* at time *t*.

H_{11}: Corruption does not have a significant impact on FDI inflows of Country *i* at time *t*.

H_{12}: Ethnic tensions do not have a significant impact on FDI inflows of Country *i* at time *t*.

H_{13}: External conflict does not have a significant impact on FDI inflows of Country *i* at time *t*.

H_{14}: Government stability does not have a significant impact on FDI inflows of Country *i* at time *t*.

H_{15}: Internal conflict does not have a significant impact on FDI inflows of Country *i* at time *t*.

H_{16}: Law and order does not have a significant impact on FDI inflows of Country *i* at time *t*.

H_{17}: Military in politics does not have a significant impact on FDI inflows of Country *i* at time *t*.

H_{18}: Religious tensions do not have a significant impact on FDI inflows of Country *i* at time *t*.

H_{19}: Socio- economic conditions do not have a significant impact on FDI inflows of Country *i* at time *t*.

3.5.4 Interpretation of Result Analysis- Multiple Regression Analysis:

The results of both the multiple regression models (economic determinants only and institutional determinants only) are to be interpreted in the following contextual terms:

1. **Coefficient of determination (R- squared):** The percent of the variance in the dependent variable that can be explained by all of the independent determinants taken together. In other words, it is the proportion of variability in a data set that is accounted for by a statistical model. The term "variability" is defined as the sum of squares (SS). It is represented by the following formula:

$$R^2 = \frac{SS\ Regression}{SS\ Total} \quad \text{.....(6)}$$

Or

$$R^2 = 1 - \frac{SS\ Error}{SS\ Total}$$

2. **Adjusted R- squared:** This is just a slight modification of the R^2. Logically, it only increases if the additional predictor improves the model more than expected otherwise it decreases potentially leading to a negative result. Adjusted R- squared is always lesser than or equal to r- squared. It is represented by the following formula:

$$R^2_{adj} = 1 - \left[\frac{(1-R^2)(n-1)}{n-k-1}\right] \quad \text{.....(7)}$$

where, R^2 is the coefficient of determination

n = number of data points in the sample

k = number of independent regressors

3. **F- statistic:** It tests the overall significance of the regression model. Specifically, it tests the null hypothesis that all of the regression coefficients are equal to zero. This tests the full model against a model with no determinants and with the estimate of the dependent variable being the mean of the values of the dependent variable. The F value is the ratio of the mean regression sum of squares divided by the mean error sum of squares. Its value will range from zero to an arbitrarily large number.
4. **Durbin- Watson statistic:** This statistic indicates the likelihood that the deviation (error) values for the regression have a first-order autoregression component. The regression models assume that the error deviations are uncorrelated. Small values of the Durbin-Watson statistic indicate the presence of autocorrelation. A value less than 0.80 usually indicate that autocorrelation is likely.

3.5.4.1 Residual Diagnostic Testing:

After this, all the other assumptions of Classical Linear Regression Model (CLRM) are also tested to make it a model of best fit. Firstly, the residuals of the model should be normally distributed, secondly they should not be serially correlated and lastly that they do not have the problem of heteroskedasticity. These assumptions have been checked using the following tests:

(a) **Jarque- Bera Test for checking the problem of normality** in the residuals of the model (H_0: Residuals are normally distributed; Check the value of Jarque Bera and its corresponding p-value, reject the null hypothesis if p-value is less than 0.05)**.**

(b) **Breusch-Godfrey Serial Correlation LM Test for checking the problem of serial correlation** in the residuals of the model (H_0: Residuals are serially correlated; Check the value of Observed R- square and its corresponding p-value, reject the null hypothesis if p-value is less than 0.05)**.**

(c) **Breusch-Pagan-Godfrey Test for checking the problem of heteroskedasticity** in the residuals of the model (H_0: Residuals are heteroskedastic; Check the value of

Observed R- square and its corresponding p-value, reject the null hypothesis if p-value is less than 0.05)**.**

3.6 Methodological framework for Objective # 3: *To estimate the most significant determinants impacting the FDI inflows in BRICS nations as a group.*

3.6.1 Statistical Software used for this objective of the study:

STATA software (Version 12.0) is used for estimating the most significant determinants impacting the FDI inflows in BRICS nations as a group.

3.6.2 Techniques used for this objective of the study:

In order to evaluate the potential determinants of FDI inflows for the BRICS countries as a group, Panel Data Analysis has been employed. Along with the Common Constant Model (OLS Regression), both Fixed Effects (FE) model and Random Effects (RE) models have also been tested to explore the key determinants of FDI inflow into BRICS countries due to the fact that the former takes into consideration the country-specific effect and the latter considers the time effect.

To estimate the most significant economic and institutional determinants as mentioned above, following two models are tested in the context of BRICS as a group:

MODEL 1: Includes only economic determinants as independent variables and FDI inflows as the dependent variable.

$$Y_{it} = \alpha + \beta_1 X1_{it} + \beta_2 X2_{it} + \beta_3 X3_{it} + \beta_4 X4_{it} + \beta_5 X5_{it} + \beta_6 X6_{it} + \beta_7 X7_{it} + \beta_8 X8_{it} + \beta_9 X9_{it} + \mu_{it} \quad \text{.....(8)}$$

MODEL 2: Includes only institutional determinants as independent variables and FDI inflows as the dependent variable.

$$Y_{it} = \theta + \lambda_1 X10_{it} + \lambda_2 X11_{it} + \lambda_3 X12_{it} + \lambda_4 X13_{it} + \lambda_5 X14_{it} + \lambda_6 X15_{it} + \lambda_7 X16_{it} + \lambda_8 X17_{it} + \lambda_9 X18_{it} + \lambda_{10} X19_{it} + \varepsilon_{it} \quad \text{.....(9)}$$

All the variables mentioned in equations 8-9 have the same interpretation as done in Section 3.5.2 above.

3.6.3 Hypotheses testing for this objective of the study (BRICS countries as a group):

All the hypothesis are same as mentioned in Section 3.5.3 except for the fact that they are tested in Section 3.5.3 from individual countries perspective whereas in this Section, they are tested from the context of BRICS countries as a group.

3.6.4 Interpretation of Result Analysis- Panel Data Analysis:

In order to evaluate the potential determinants of FDI inflows for the BRICS countries as a group, Panel Data Analysis (Balestra, P. (1992)) has been employed. A panel is a cross-section or group of people who are surveyed periodically over a given time span. A panel data set offers several econometric benefits over traditional pure cross section or pure time series data sets. Panel data analysis is being used extensively in economics and finance research to study cross-country economic issues (Maddala (1999) and Webb and Hall (2009)). The most obvious advantage is that the number of observations is typically much larger in panel data, which will produce more reliable parameter estimates and, thus, enable us to test the robustness of our linear regression results. Panel data also alleviates the problem of multicollinearity, because when the explanatory determinants vary in two dimensions (cross-section and time series), they are less likely to be highly correlated.

Along with the Common Constant Model (OLS Regression), both Fixed Effects (FE) model and Random Effects (RE) models have also been tested to explore the key determinants of FDI inflow into BRICS countries due to the fact that the former takes into consideration the country-specific effect and the latter considers the time effect.

(a) The Common Constant Model (also called as pooled OLS method): It presents result under the main assumption that there are no differences among the data matrices of the cross sectional dimension (N). In other words, the model estimates a Common Constant for all Cross-sections (countries in our study). This model is useful under the hypothesis that the data set is a priori homogeneous. The null hypothesis is that all the constants are the same (homogeneous), and therefore the Common Constant method is applicable:

$$H_0 = \alpha_1 = \alpha_2 = \alpha_N \quad \text{.....(10)}$$

However, this case is quite restrictive and case of more interest involves the inclusion of Fixed and Random effects in the method of estimation.

(b) Fixed Effects (FE) Model: This model treats the constant as group specific, i.e. there are different constants for each groups. It includes a dummy variable for each group. Where, the dummy variable is the one that allows us to take different group-specific estimates for each of the constants for every different section.

The FE Model is specified as under:

$$y_{it} = \alpha_i + \sum_{k=1}^{k} X_{itk}\beta_k + \varepsilon_{it} \quad \text{.....(11)}$$

where, i= 1,2,…..,N

t= 1,2,…..,T

where y_{it} represents the value of the dependent variable, i.e. FDI inflows in cross-section *i* (five countries in our case); *T* is the length of time series, i.e.1983- 2013 for Brazil, India, China and South Africa and 1995-2013 for Russia; *k* is the number of independent determinants explaining the dependent variable. The term α_i denotes unobserved country-specific effects which are assumed to be fixed over time and different across country *i*. X_{it} and β represent the vectors of explanatory determinants and their parameters respectively. The subscript *i* indicates individual countries, while *t* shows different time periods. ε_{it} represents the vector of the error component which is assumed to be independently distributed across *i* and over *t* with mean zero and variance σ^2.

(c) Random Effects (RE) Model: This model of estimation handles the constants for each section as random parameters rather than fixed or constant. Hence the variability of the constant for each section comes.

In the RE case, the model is defined as:

$$y_{it} = \mu + \sum_{k=1}^{k} X_{itk}\beta_k + v_{it} \quad \text{.....(12)}$$

where, i= 1,2,…..,N

t= 1,2,…..,T

$v_{it} = \alpha_i + \varepsilon_{it}$, t= 1,. . . . ,T are the composite errors

For each t, v_{it} is the sum of the unobserved effect and an idiosyncratic error (Wooldridge (2010)). α_i are assumed to be independently distributed across *i,* with mean zero and variance σ_α^2 and uncorrelated with X_{it}. The error term ε_{it} is assumed to be independently distributed across *i* and over *t* with mean zero and variance σ^2.

Finally, it can be seen that in the Panel Data Analysis, the Fixed Effects model assumes that each country differs in its intercept term whereas the Random Effects model assumes that each country differs in its error term.

Hausman Specification Test

Generally, when the Panel is balanced, it is expected the Fixed Effects model would work well and when the Panel is unbalanced, the Random Effects Model would be a better model. However, the Hausman (1978) specification test guides us to choose the appropriate Panel Data model. Therefore in such case, following hypotheses are tested:

Null Hypothesis: H_0: Cov (α_i, X_{it}) = 0 i.e. Random Effect model is suitable, if Null Hypothesis is accepted.

Alternate Hypothesis: H_a: Cov (α_i, X_{it}) ≠ 0 i.e. Fixed Effect model is suitable, if Alternate Hypothesis is accepted.

It is proven that under the null hypothesis, the two estimates, FE and RE could not differ significantly, since they are both consistent. So, the test is based on the difference. Under the null hypothesis, the Hausman statistic is asymptotically distributed as chi-square with *k* degrees of freedom. The Hausman test uses the following test statistic:

$H = \left(\hat{\beta}^{FE} - \hat{\beta}^{RE}\right)\left[Var\left(\hat{\beta}^{FE}\right) - Var\left(\hat{\beta}^{RE}\right)\right]^{-1}\left(\hat{\beta}^{FE} - \hat{\beta}^{RE}\right) \sim \chi^2$ with k degrees of freedom……(13)

where,

H= Hausman Test Statistic

$\hat{\beta}^{FE}$= Vector of Fixed Effects estimates

$\hat{\beta}^{RE}$ = Vector of Random Effects estimates

χ^2 = Chi- Square distribution Statistic

If $p < 0.05 \rightarrow$ FE is suitable

If $p > 0.05 \rightarrow$ RE is suitable

where,

p is the probability value of the test statistic

If the value of the statistic is large, then the difference between the estimates is significant, so the Null Hypothesis can be rejected and Fixed Effects Model can be used. On the contrary, a small value of the Hausman statistic implies the Random effect is more appropriate estimator.

Choosing the best model:

While applying the Panel Data Models, various statistical tests need to be applied to check which model out of the three estimated models (explained in the previous

section) is the model of best fit. Thus, firstly, the study checks whether FE Model is better than the OLS Model. For this purpose, the standard F-test can be used to analyze whether Fixed effects (i.e., different constants for each group) should indeed be included in the model or not.

The F statistics is:

$$\frac{(R^2_{FE} - R^2_{CC})/ (N-1)}{(1 - R^2_{FE})/ (NT-N-k)} \sim F\ (N-1, NT-N-k).....(14)$$

where R^2_{FE} is the coefficient of determination of the FE model and R^2_{CC} is the coefficient of determination of the Common constant model. If F-statistical is bigger than the F-critical then the null hypothesis can be rejected (which assumes that all the constants are homogeneous) and therefore, FE Model should be used as a model of estimation.

Secondly, the comparison is made between the FE Model and RE Model in which Hausman specification test can be useful. If the value of the statistic is large, and the difference between the estimates is significant, the Null Hypothesis can be rejected (which assumes the Hausman statistic is asymptotically distributed as chi-square with *k* degrees of freedom) and the Fixed Effects Model can be used. On the contrary, a small and non significant value of the Hausman statistic implies that the Random effect model is more appropriate estimator.

Lastly, Breusch- Pagan (1980) Lagrange Multiplier test is also computed to test whether the RE Model is preferable over the Common Constant Model (OLS Regression). In other words, it can be proved with the help of this test that whether there is an evidence of significant differences across countries or not. Otherwise, a simple OLS regression model can be run.

3.6.4.1 Residual Diagnostic Testing:

After running and testing the suitability of all the three panel data models, residual diagnostic tests are also conducted in the study to make the appropriate model (as chosen above) as the model of best fit. Following tests are conducted for this purpose:

- ***Testing for time fixed effects*** (The value of F statistic and the probability of this F-test)

- ***Testing for cross-sectional dependence/ contemporaneous correlation*** (Pesaran (2004) cross-sectional dependence (CD) test)
- ***Testing for heteroskedasticity*** (Modified Wald (1945) test for group wise heteroskedasticity) and ***Correcting the problem of heteroskedasticity*** (White (1980) Heteroskedasticity-Consistent Standard Errors & Covariance method or OLS with Robust Standard Errors Model)
- ***Testing for serial correlation*** (Wooldridge (2010) test for autocorrelation)

3.7 Methodological framework for Objective # 4: *To examine the trends and patterns of macro- economic environment and institutional quality, challenges and prospects of BRICS nations.*

3.7.1 Statistical Software used for this objective of the study:

MS- Excel has been used to examine the trends and patterns of macro- economic environment and institutional quality of all the five countries and across the whole period.

3.7.2 Techniques used for this objective of the study:

Country wise and period wise trend analysis has been done to examine the pattern followed by the macro- economic determinants and institutional determinants affecting the economic growth as well as the FDI inflows in all these five countries individually and also as a group. A comparative analysis is also done across all the five countries regarding ranking them across all these parameters and finding out the areas where they are leading or lagging.

3.7.3 Interpretation of Result Analysis- Trend Analysis:

Following statistical tests have been conducted for the trend analysis (both country wise and period wise):

(a) Country wise trend analysis: Trend analysis of all the economic (Y- X9) and institutional (X10- X19) determinants of FDI and economic growth for all the five countries have been conducted. Mean, Median, Standard Deviation, Maximum and Minimum statistics have been calculated for all the determinants for showing how Brazil, Russia, India, China and South Africa have performed as individual countries over the years regarding macro- economic environment (1983- 2015) and institutional quality (1995- 2015).

(b) Period wise trend analysis: Trend analysis is done to assess the trend of macro-economic determinants over the period 1983- 2015 (except Russia for which period is considered from 1995-2015) and of institutional determinants over the period 1995-2015 for BRICS countries as a group.

3.8 Conclusion

This chapter of the study discussed the research objectives and the research design used for the study. Research design of the study elaborates on the sample size, period, sources of data, determinants (dependent and independent) used and model specification. Further, this chapter provided the details about the methodological framework for analyzing the objectives of the study. This also included a discussion about the statistical software used, hypotheses testing and the techniques applied to analyze these hypotheses. The next chapters 4-7 will discuss the results derived from the analysis conducted for each of the objectives of the study mentioned in this chapter.

CHAPTER- 4

(ANALYSIS: I)

CHAPTER: 4- CAUSAL RELATIONSHIP BETWEEN FDI AND ECONOMIC GROWTH IN BRICS NATIONS

4.1 Introduction

New sources of FDI and technology have played an important role in this process of integration. Policy decisions concerning how to deal with large capital flows require an understanding of the factors driving such flows. The most pervasive idea among researchers and policy makers is that FDI enhances growth in diverse ways. It raises the capital base and employment opportunities. It brings technological development to local firms, which improves the productivity of host countries and stimulates economic growth. Various theories exist related to the contribution of FDI inflows to the economic growth of recipient countries.

.An extensive review of literature in this study reveals a gap in the existing literature pertaining to the study of this causal linkage between FDI and economic growth in the context of the Brazil, Russia, India, China and South Africa (BRICS) countries. Thus, this study fills this gap by analyzing this relationship and suggesting the policy makers that in which direction should they make efforts which will help them become supreme powers of the world.

4.2 Models specification

In order to analyze the cause and effect relationship between FDI inflows and economic growth as represented by economic and institutional determinants in the BRICS countries individually, following two models are tested:

$$\mathrm{FDI_t} = \mathrm{c_1} + \sum_{i=1}^{m} \alpha_{i}\, \mathrm{FDI_{t-i}} + \sum_{j=1}^{n} \beta_{j}\, \mathrm{EV\&}IV_{\mathrm{t-j}} + \mu_{\mathrm{t}} \ldots\ldots (1)$$

$$\mathrm{EV\&}IV_{\mathrm{t}} = \mathrm{c_2} + \sum_{i=1}^{p} \theta_{i}\, \mathrm{EV\&}IV_{\mathrm{t-i}} + \sum_{j=1}^{q} \lambda_{j}\, \mathrm{FDI_{t-j}} + \varepsilon_{\mathrm{t}} \ldots\ldots (2)$$

Pair- wise Granger's causality test has been applied for both the above mentioned models and for all the five countries individually.

4.3 Empirical Results and Discussions

4.3.1 MODEL 1: ONLY ECONOMIC DETERMINANTS

(A) Unit Root Test for checking stationarity

The unit root property of the data series is crucial for the causality analysis. The Augmented Dickey Fuller (ADF) test is employed to examine stationary property of the selected data series. Tables 4.1 and 4.2 depict the results of ADF test for all the economic determinants of all the BRICS countries individually and also the type of conversions done to make the non- stationary series into stationary series respectively.

Table 4.1: Results of ADF Unit Root Test (At Levels)

Name of the countries	Determinants	t- statistic		
		Intercept	With Intercept and Trend	Without Intercept and Trend
Brazil	**Y**	-0.9508	-4.0199**	-0.1771
	X1	-4.1262*	-4.0036**	-1.8949***
	X2	-1.1723	-1.8250	1.2538
	X3	-1.7028	-3.8849**	-1.4260
	X4	-1.3194	-1.6870	-0.1463
	X5	-1.3109	-2.0052	0.6028
	X6	-1.9098	-2.3514	-0.4807
	X7	-5.7492*	-4.0876**	-2.8367*
	X8	-1.5716	-2.8566	0.3470
	X9	-1.8622	-1.7159	-0.4905
Russia	**Y**	-1.6471	-1.4327	-1.1002
	X1	-3.5135**	-3.0586	-2.9332*
	X2	-0.4272	-2.1069	2.0702
	X3	-6.0742*	-2.7477	-5.7250*
	X4	-0.7875	-3.2169	-0.6836
	X5	-2.0590	-2.3856	-0.1975
	X6	-1.9078	-2.8310	-0.4308
	X7	-3.6490**	-3.4639***	-3.9411*

Name of the countries	Determinants	t- statistic		
		Intercept	With Intercept and Trend	Without Intercept and Trend
	X8	-1.3943	-2.9530	0.1554
	X9	-1.6768	-2.6693	-1.2445
India	Y	0.0406	-1.8094	0.8258
	X1	-4.8972*	-5.5028*	-0.9856
	X2	0.7938	-1.5883	2.2681
	X3	-3.6293**	-3.6453**	-1.2044
	X4	-3.7581*	-0.9834	-2.0591**
	X5	-0.5843	-1.9070	1.2374
	X6	-3.3405**	-0.5432	-1.4887
	X7	-7.2991*	-7.3764*	-1.7368***
	X8	-1.7935	-2.0810	-0.2066
	X9	2.1832	-1.0778	4.1492
China	Y	2.2175	-2.0061	2.4921
	X1	-4.0501*	-4.2112**	-1.1255
	X2	0.4024	-2.0265	0.2430
	X3	-3.2965**	-4.0317**	-1.8482***
	X4	-1.2454	-2.2941	1.2471
	X5	-1.8137	-1.0567	0.3334
	X6	-3.3377**	-2.3274	-1.5507
	X7	-3.7267*	-3.8688**	-1.9067***
	X8	-1.0180	-2.9543	-0.1867
	X9	1.3397	-0.3905	2.1436
South Africa	Y	-3.1133**	-5.0154*	0.0311
	X1	-3.9526*	-4.0728**	-2.4267**
	X2	-0.8473	-2.4497	0.9764
	X3	-1.3971	-0.8806	-2.5920**

Name of the countries	Determinants	t- statistic		
		Intercept	With Intercept and Trend	Without Intercept and Trend
	X4	-2.4586	-2.6925	0.8462
	X5	-1.5141	-2.7977	0.1012
	X6	0.1012	-5.2727*	-1.3403
	X7	-4.7903*	-4.6979*	-4.4695*
	X8	0.1244	-2.9540	1.0963
	X9	-0.9149	-2.2447	-1.5770

Note: *, ** and *** indicate significance at one percent, five percent and ten percent level respectively. Optimal Lag Length is determined by the automatic selection of Schwarz Information Criteria (SC) for the ADF Test in E-Views 7.0.

In the above table, it can be seen that there are certain data series in all the five countries which are stationary at levels in all the three cases or in any one or two cases (i.e. intercept, trend and intercept and without trend and intercept) and there are certain data series which are not stationary at any level. Therefore, following conversions have been made in the data series by either converting them into first/ second differenced or into log growth series so that they become stationary.

Table 4.2: Type of conversions made in the original data series of economic determinants

Name of the countries	Determinants	Type of conversion
Brazil	Y	First Differencing
	X1	Original
	X2	Log Growth
	X3	First Differencing
	X4	Log Growth
	X5	Log Growth
	X6	Log Growth
	X7	Original

Name of the countries	Determinants	Type of conversion
	X8	Log Growth
	X9	First Differencing
Russia	Y	First Differencing
	X1	First Differencing
	X2	Second Differencing
	X3	Second Differencing
	X4	Second Differencing
	X5	Log Growth
	X6	Second Differencing
	X7	First Differencing
	X8	Log Growth
	X9	Second Differencing
India	Y	Log Growth
	X1	Log Growth
	X2	Second Differencing
	X3	Log Growth
	X4	Second Differencing
	X5	Log Growth
	X6	Log Growth
	X7	First Differencing
	X8	Log Growth
	X9	First Differencing
China	Y	Log Growth
	X1	Log Growth
	X2	Log Growth and then first differencing
	X3	First Differencing
	X4	Log Growth
	X5	Log Growth
	X6	Log Growth
	X7	Log Growth

Name of the countries	Determinants	Type of conversion
	X8	Log Growth
	X9	Log Growth
South Africa	Y	First Differencing
	X1	Original
	X2	Log Growth
	X3	First Differencing
	X4	Log Growth
	X5	Log Growth
	X6	Log Growth
	X7	Original
	X8	Log Growth
	X9	First Differencing

After the above conversions are done in the non- stationary series of economic determinants, the ADF test of unit root is applied again to check the stationarity, the results of which are summarized in Table 4.3:

Table 4.3: Results of ADF Unit Root Test after conversion of data series of economic determinants (At Levels)

Name of the countries	Determinants	t- statistic		
		Intercept	**With Intercept and Trend**	**Without Intercept and Trend**
Brazil	**Y**	-6.5850*	-5.0777*	-6.4624*
	X1	-4.5660*	-4.5006*	-2.7685*
	X2	-4.9959*	-5.0908*	-4.6011*
	X3	-4.8790*	-4.6521*	-4.3499*
	X4	-4.8079*	-4.7543*	-4.8806*
	X5	-5.1615*	-5.0910*	-5.2264*
	X6	-4.7232*	-4.5664*	-4.7888*
	X7	-4.1334*	-4.0278**	-3.3266**
	X8	-5.6864*	-5.5787*	-5.6608*

Name of the countries	Determinants	t- statistic		
		Intercept	With Intercept and Trend	Without Intercept and Trend
	X9	-5.4112*	-5.4559*	-5.4401*
Russia	Y	-4.4574*	-4.5450*	-4.5834*
	X1	-6.0023*	-4.6875*	-6.1817*
	X2	-4.7122*	-5.0261*	-4.8570*
	X3	-18.2355*	-18.2023*	-15.3494*
	X4	-4.8597*	-4.8345*	-4.9892*
	X5	-3.7702**	-3.6167***	-3.8644*
	X6	-3.2733**	-3.3149***	-3.2528*
	X7	-5.7069*	-5.8282*	-5.8827*
	X8	-5.0512*	-3.7696**	-4.5664*
	X9	-4.5959*	-3.8741**	-4.0395*
India	Y	-8.4173*	-8.6166*	-7.2015*
	X1	-4.1474*	-4.0559**	-5.4772*
	X2	-7.0910*	-7.0287*	-7.2096*
	X3	-7.4333*	-7.3106*	-7.5390*
	X4	-5.8421*	-5.7449*	-5.8867*
	X5	-4.9365*	-4.8460*	-2.0750**
	X6	-2.9579**	-4.3551*	-2.9532*
	X7	-6.7819*	-6.6856*	-6.9013*
	X8	-5.0894*	-5.0024*	-5.1576*
	X9	-3.7378*	-4.5054*	-2.9409*
China	Y	-3.7994*	-4.1826**	-3.0708*
	X1	-4.7257*	-6.7779*	4.7945*
	X2	-5.0712*	-5.0134*	-5.1551*
	X3	-4.5416*	-4.5099*	-4.6338*
	X4	-5.5311*	-5.4370*	-5.1693*
	X5	-4.5439*	-5.1708*	-4.3668*
	X6	-4.3961	-5.3638*	-4.4478*

Name of the countries	Determinants	t- statistic		
		Intercept	**With Intercept and Trend**	**Without Intercept and Trend**
	X7	-4.6399*	-4.6513*	-4.6756*
	X8	-4.8171*	-4.8440*	-4.8920*
	X9	-7.4869*	-7.4164*	-7.5442*
South Africa	**Y**	-6.6713*	-6.4881*	-6.6097*
	X1	-4.3125*	-4.2664**	-2.4205**
	X2	-5.1841*	-5.0920*	-5.0642*
	X3	-5.6176*	-5.7133*	-2.3665**
	X4	-6.2191*	-6.5000*	-5.9548*
	X5	-5.9557*	-5.8317*	-5.9783*
	X6	-4.9872*	-4.9641*	-4.8890*
	X7	-3.8273*	-3.9147**	-3.6210*
	X8	-7.7842*	-7.9192*	-7.9192*
	X9	-5.3780*	-5.2979*	5.2979*

Note: *, ** and *** indicate significance at one percent, five percent and ten percent level respectively. Optimal Lag Length is determined by the automatic selection of Schwarz Information Criteria (SC) for the ADF Test in E-Views 7.0.

(B) Correlation Analysis for checking multicollinearity

Once the data becomes stationary, the next step is to apply the Granger's causality test to identify the direction of causality between FDI and all the economic determinants representing the economic growth. However, in general most of the macro- economic determinants may be correlated, so before using them in Granger's specification test, the problem of multicollinearity should be addressed. Therefore, the existence of correlation among the macro-economic determinants has been verified using correlation matrix before applying Granger's causality test. If the value of Pearson correlation coefficient is more than 0.8, then those determinants are highly correlated. Following is the correlation matrix of each of the five countries of all the economic determinants:

Table 4.4: Correlation Matrix of economic determinants representing economic growth in Brazil

Correlations										
		Y	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**	**X7**	**X8**	**X9**
Y	Pearson Correlation	1	.395*	.391*	-.016	-.317	-.024	.324	.313	-.112	-.122
	Sig. (2-tailed)		.023	.024	.929	.072	.896	.066	.076	.537	.500
	N	33	33	33	33	33	33	33	33	33	33
X1	Pearson Correlation	.395*	1	.937**	-.144	-.655**	-.448**	.477**	.816**	-.232	-.052
	Sig. (2-tailed)	.023		.000	.424	.000	.009	.005	.000	.193	.775
	N	33	33	33	33	33	33	33	33	33	33
X2	Pearson Correlation	.391*	.937**	1	-.033	-.585**	-.308	.414*	.682**	-.231	-.080
	Sig. (2-tailed)	.024	.000		.854	.000	.081	.017	.000	.196	.660
	N	33	33	33	33	33	33	33	33	33	33
X3	Pearson Correlation	-.016	-.144	-.033	1	-.001	.080	.189	-.311	.191	-.310
	Sig. (2-tailed)	.929	.424	.854		.995	.657	.293	.078	.286	.079
	N	33	33	33	33	33	33	33	33	33	33
X4	Pearson Correlation	-.317	-.655**	-.585**	-.001	1	.467**	-.401*	-.508**	.283	.050
	Sig. (2-tailed)	.072	.000	.000	.995		.006	.021	.003	.111	.781
	N	33	33	33	33	33	33	33	33	33	33
X5	Pearson Correlation	-.024	-.448**	-.308	.080	.467**	1	-.660**	-.407*	.229	.163
	Sig. (2-tailed)	.896	.009	.081	.657	.006		.000	.019	.201	.364
	N	33	33	33	33	33	33	33	33	33	33
X6	Pearson Correlation	.324	.477**	.414*	.189	-.401*	-.660**	1	.473**	-.269	-.077
	Sig. (2-tailed)	.066	.005	.017	.293	.021	.000		.005	.130	.669
	N	33	33	33	33	33	33	33	33	33	33
X7	Pearson Correlation	.313	.816**	.682**	-.311	-.508**	-.407*	.473**	1	-.317	-.065
	Sig. (2-tailed)	.076	.000	.000	.078	.003	.019	.005		.073	.720
	N	33	33	33	33	33	33	33	33	33	33
X8	Pearson Correlation	-.112	-.232	-.231	.191	.283	.229	-.269	-.317	1	.102
	Sig. (2-tailed)	.537	.193	.196	.286	.111	.201	.130	.073		.574
	N	33	33	33	33	33	33	33	33	33	33
X9	Pearson Correlation	-.122	-.052	-.080	-.310	.050	.163	-.077	-.065	.102	1
	Sig. (2-tailed)	.500	.775	.660	.079	.781	.364	.669	.720	.574	
	N	33	33	33	33	33	33	33	33	33	33
*. Correlation is significant at the 0.05 level (2-tailed).											
**. Correlation is significant at the 0.01 level (2-tailed).											

Table 4.5: Correlation Matrix of economic determinants representing economic growth in Russia

Correlations											
		Y	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**	**X7**	**X8**	**X9**
Y	Pearson Correlation	1	.337	.207	.032	-.096	.002	.419	.226	-.137	-.817**
	Sig. (2-tailed)		.135	.369	.889	.677	.995	.059	.324	.554	.000
	N	21	21	21	21	21	21	21	21	21	21
X1	Pearson Correlation	.337	1	.925**	.289	-.624**	.394	.486*	.824**	.150	-.638**
	Sig. (2-tailed)	.135		.000	.203	.003	.078	.026	.000	.517	.002
	N	21	21	21	21	21	21	21	21	21	21
X2	Pearson Correlation	.207	.925**	1	.124	-.633**	.366	.434*	.823**	.074	-.542*
	Sig. (2-tailed)	.369	.000		.593	.002	.103	.050	.000	.749	.011
	N	21	21	21	21	21	21	21	21	21	21
X3	Pearson Correlation	.032	.289	.124	1	.036	.304	-.310	-.049	.373	-.170
	Sig. (2-tailed)	.889	.203	.593		.876	.180	.172	.832	.096	.461
	N	21	21	21	21	21	21	21	21	21	21
X4	Pearson Correlation	-.096	-.624**	-.633**	.036	1	-.332	-.534*	-.675**	-.143	.416
	Sig. (2-tailed)	.677	.003	.002	.876		.142	.013	.001	.537	.061
	N	21	21	21	21	21	21	21	21	21	21
X5	Pearson Correlation	.002	.394	.366	.304	-.332	1	-.204	.278	.025	-.184
	Sig. (2-tailed)	.995	.078	.103	.180	.142		.375	.222	.915	.425
	N	21	21	21	21	21	21	21	21	21	21
X6	Pearson Correlation	.419	.486*	.434*	-.310	-.534*	-.204	1	.657**	.091	-.507*
	Sig. (2-tailed)	.059	.026	.050	.172	.013	.375		.001	.694	.019
	N	21	21	21	21	21	21	21	21	21	21
X7	Pearson Correlation	.226	.824**	.823**	-.049	-.675**	.278	.657**	1	.249	-.441*
	Sig. (2-tailed)	.324	.000	.000	.832	.001	.222	.001		.277	.045
	N	21	21	21	21	21	21	21	21	21	21
X8	Pearson Correlation	-.137	.150	.074	.373	-.143	.025	.091	.249	1	.154
	Sig. (2-tailed)	.554	.517	.749	.096	.537	.915	.694	.277		.505
	N	21	21	21	21	21	21	21	21	21	21
X9	Pearson Correlation	-.817**	-.638**	-.542*	-.170	.416	-.184	-.507*	-.441*	.154	1
	Sig. (2-tailed)	.000	.002	.011	.461	.061	.425	.019	.045	.505	
	N	21	21	21	21	21	21	21	21	21	21
**. Correlation is significant at the 0.01 level (2-tailed).											
*. Correlation is significant at the 0.05 level (2-tailed).											

Table 4.6: Correlation Matrix of economic determinants representing economic growth in India

Correlations											
		Y	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**	**X7**	**X8**	**X9**
Y	Pearson Correlation	1	-.066	.087	-.373*	-.244	.132	-.099	.086	-.008	.035
	Sig. (2-tailed)		.716	.629	.032	.170	.466	.583	.634	.966	.847
	N	33	33	33	33	33	33	33	33	33	33
X1	Pearson Correlation	-.066	1	.158	.028	-.362*	-.281	.196	.528**	-.159	-.244
	Sig. (2-tailed)	.716		.381	.876	.039	.113	.274	.002	.378	.171
	N	33	33	33	33	33	33	33	33	33	33
X2	Pearson Correlation	.087	.158	1	-.006	-.133	.093	.319	.160	-.077	-.178
	Sig. (2-tailed)	.629	.381		.973	.460	.607	.070	.375	.671	.321
	N	33	33	33	33	33	33	33	33	33	33
X3	Pearson Correlation	-.373*	.028	-.006	1	.301	-.044	.077	-.044	-.100	.020
	Sig. (2-tailed)	.032	.876	.973		.089	.808	.670	.809	.578	.910
	N	33	33	33	33	33	33	33	33	33	33
X4	Pearson Correlation	-.244	-.362*	-.133	.301	1	-.120	-.147	-.172	.334	-.027
	Sig. (2-tailed)	.170	.039	.460	.089		.507	.415	.337	.057	.882
	N	33	33	33	33	33	33	33	33	33	33
X5	Pearson Correlation	.132	-.281	.093	-.044	-.120	1	-.276	-.182	-.334	.197
	Sig. (2-tailed)	.466	.113	.607	.808	.507		.120	.310	.058	.273
	N	33	33	33	33	33	33	33	33	33	33
X6	Pearson Correlation	-.099	.196	.319	.077	-.147	-.276	1	.172	-.037	.241
	Sig. (2-tailed)	.583	.274	.070	.670	.415	.120		.340	.838	.176
	N	33	33	33	33	33	33	33	33	33	33
X7	Pearson Correlation	.086	.528**	.160	-.044	-.172	-.182	.172	1	-.076	-.240
	Sig. (2-tailed)	.634	.002	.375	.809	.337	.310	.340		.673	.178
	N	33	33	33	33	33	33	33	33	33	33
X8	Pearson Correlation	-.008	-.159	-.077	-.100	.334	-.334	-.037	-.076	1	-.068
	Sig. (2-tailed)	.966	.378	.671	.578	.057	.058	.838	.673		.706
	N	33	33	33	33	33	33	33	33	33	33
X9	Pearson Correlation	.035	-.244	-.178	.020	-.027	.197	.241	-.240	-.068	1
	Sig. (2-tailed)	.847	.171	.321	.910	.882	.273	.176	.178	.706	
	N	33	33	33	33	33	33	33	33	33	33
*. Correlation is significant at the 0.05 level (2-tailed).											
**. Correlation is significant at the 0.01 level (2-tailed).											

Table 4.7: Correlation Matrix of economic determinants representing economic growth in China

Correlations											
		Y	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**	**X7**	**X8**	**X9**
Y	Pearson Correlation	1	.399*	.401*	.474**	-.216	.250	-.093	.310	-.423*	.007
	Sig. (2-tailed)		.021	.021	.005	.227	.160	.608	.079	.014	.967
	N	33	33	33	33	33	33	33	33	33	33
X1	Pearson Correlation	.399*	1	.936**	.147	-.578**	.236	-.283	.613**	-.043	.009
	Sig. (2-tailed)	.021		.000	.413	.000	.186	.110	.000	.814	.962
	N	33	33	33	33	33	33	33	33	33	33
X2	Pearson Correlation	.401*	.936**	1	.207	-.628**	.293	-.273	.650**	-.226	-.027
	Sig. (2-tailed)	.021	.000		.247	.000	.098	.125	.000	.207	.881
	N	33	33	33	33	33	33	33	33	33	33
X3	Pearson Correlation	.474**	.147	.207	1	.020	.311	.039	.283	-.399*	-.030
	Sig. (2-tailed)	.005	.413	.247		.911	.078	.828	.110	.021	.866
	N	33	33	33	33	33	33	33	33	33	33
X4	Pearson Correlation	-.216	-.578**	-.628**	.020	1	-.156	.233	-.274	.169	.183
	Sig. (2-tailed)	.227	.000	.000	.911		.387	.192	.123	.346	.309
	N	33	33	33	33	33	33	33	33	33	33
X5	Pearson Correlation	.250	.236	.293	.311	-.156	1	-.721**	.040	-.336	-.183
	Sig. (2-tailed)	.160	.186	.098	.078	.387		.000	.827	.056	.308
	N	33	33	33	33	33	33	33	33	33	33
X6	Pearson Correlation	-.093	-.283	-.273	.039	.233	-.721**	1	.014	.036	.024
	Sig. (2-tailed)	.608	.110	.125	.828	.192	.000		.938	.840	.896
	N	33	33	33	33	33	33	33	33	33	33
X7	Pearson Correlation	.310	.613**	.650**	.283	-.274	.040	.014	1	-.081	.081
	Sig. (2-tailed)	.079	.000	.000	.110	.123	.827	.938		.653	.653
	N	33	33	33	33	33	33	33	33	33	33
X8	Pearson Correlation	-.423*	-.043	-.226	-.399*	.169	-.336	.036	-.081	1	.205
	Sig. (2-tailed)	.014	.814	.207	.021	.346	.056	.840	.653		.252
	N	33	33	33	33	33	33	33	33	33	33
X9	Pearson Correlation	.007	.009	-.027	-.030	.183	-.183	.024	.081	.205	1
	Sig. (2-tailed)	.967	.962	.881	.866	.309	.308	.896	.653	.252	
	N	33	33	33	33	33	33	33	33	33	33
*. Correlation is significant at the 0.05 level (2-tailed).											
**. Correlation is significant at the 0.01 level (2-tailed).											

Table 4.8: Correlation Matrix of economic determinants representing economic growth in South Africa

Correlations										
		Y	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**	**X7**	**X8**	**X9**
Y	Pearson Correlation	1	.175	.101	.217	-.114	.119	-.111	.063	.153	-.007
	Sig. (2-tailed)		.330	.576	.224	.527	.511	.538	.730	.394	.971
	N	33	33	33	33	33	33	33	33	33	33
X1	Pearson Correlation	.175	1	.747**	.109	-.325	.587**	-.135	.684**	-.307	-.089
	Sig. (2-tailed)	.330		.000	.545	.065	.000	.453	.000	.082	.624
	N	33	33	33	33	33	33	33	33	33	33
X2	Pearson Correlation	.101	.747**	1	.152	-.273	.726**	-.279	.655**	-.438*	.045
	Sig. (2-tailed)	.576	.000		.398	.124	.000	.116	.000	.011	.805
	N	33	33	33	33	33	33	33	33	33	33
X3	Pearson Correlation	.217	.109	.152	1	.004	.510**	-.585**	-.123	.099	.318
	Sig. (2-tailed)	.224	.545	.398		.983	.002	.000	.497	.585	.071
	N	33	33	33	33	33	33	33	33	33	33
X4	Pearson Correlation	-.114	-.325	-.273	.004	1	-.122	-.137	-.366*	-.215	.117
	Sig. (2-tailed)	.527	.065	.124	.983		.498	.446	.036	.230	.515
	N	33	33	33	33	33	33	33	33	33	33
X5	Pearson Correlation	.119	.587**	.726**	.510**	-.122	1	-.659**	.292	-.349*	.248
	Sig. (2-tailed)	.511	.000	.000	.002	.498		.000	.099	.047	.164
	N	33	33	33	33	33	33	33	33	33	33
X6	Pearson Correlation	-.111	-.135	-.279	-.585**	-.137	-.659**	1	.132	.275	-.452**
	Sig. (2-tailed)	.538	.453	.116	.000	.446	.000		.465	.121	.008
	N	33	33	33	33	33	33	33	33	33	33
X7	Pearson Correlation	.063	.684**	.655**	-.123	-.366*	.292	.132	1	-.262	-.121
	Sig. (2-tailed)	.730	.000	.000	.497	.036	.099	.465		.140	.502
	N	33	33	33	33	33	33	33	33	33	33
X8	Pearson Correlation	.153	-.307	-.438*	.099	-.215	-.349*	.275	-.262	1	-.136
	Sig. (2-tailed)	.394	.082	.011	.585	.230	.047	.121	.140		.450
	N	33	33	33	33	33	33	33	33	33	33
X9	Pearson Correlation	-.007	-.089	.045	.318	.117	.248	-.452**	-.121	-.136	1
	Sig. (2-tailed)	.971	.624	.805	.071	.515	.164	.008	.502	.450	
	N	33	33	33	33	33	33	33	33	33	33
**. Correlation is significant at the 0.01 level (2-tailed).											
*. Correlation is significant at the 0.05 level (2-tailed).											

It can be seen from the above tables of correlation matrix that in Brazil (Table 4.4), determinants X1, X2 and X7 are correlated with each other with their correlation coefficients as more than 0.8. Similarly in the case of Russia (Table 4.5), determinants X1, X2, X7 and X9 are correlated with each other. On the other hand in case of China (Table 4.7), only determinants X1 and X2 are correlated with each other. However, in case of India (Table 4.6) and South Africa (Table 4.8), none of the economic determinants are found to be correlated.

Furthermore, in order to confirm whether the selected economic determinants are free from the problem of multicollinearity, VIF (Variance Inflation factor) and tolerance level have been used. If individual VIF is more than 5, mean VIF and Tolerance level is lesser than 0.2, then it means that those determinants are highly correlated. Such determinants may be dropped from the model until the VIF values and Tolerance level come within the desired range.

After a number of iterations, following are the remaining determinants with their VIFs and Tolerance level in each country's model after dropping those determinants which were highly correlated:

Table 4.9: Collinearity Statistics of remaining economic determinants used for Granger's Causality in the context of individual BRICS countries

Name of the countries	Determinants	Tolerance Level	Variance Inflation Factor (VIF)
Brazil	**X1**	0.246	4.060
	X3	0.520	1.923
	X4	0.493	2.027
	X5	0.430	2.328
	X6	0.363	2.753
	X7	0.251	3.989
	X8	0.793	1.261
	X9	0.767	1.303
Russia	**X2**	0.469	2.134
	X3	0.496	2.016
	X4	0.440	2.272

Name of the countries	Determinants	Tolerance Level	Variance Inflation Factor (VIF)
	X5	0.589	1.698
	X6	0.323	3.097
	X8	0.610	1.639
	X9	0.418	2.392
India	**X1**	0.550	1.818
	X2	0.747	1.338
	X3	0.826	1.210
	X4	0.644	1.553
	X5	0.618	1.618
	X6	0.620	1.613
	X7	0.689	1.451
	X8	0.737	1.358
	X9	0.704	1.421
China	**X1**	0.393	2.541
	X3	0.643	1.556
	X4	0.577	1.733
	X5	0.309	3.240
	X6	0.350	2.860
	X7	0.544	1.839
	X8	0.698	1.432
	X9	0.867	1.153
South Africa	**X1**	0.327	3.054
	X2	0.222	4.503
	X3	0.512	1.954
	X4	0.719	1.390
	X5	0.202	4.962
	X6	0.345	2.902
	X7	0.371	2.695
	X8	0.590	1.695

Name of the countries	Determinants	Tolerance Level	Variance Inflation Factor (VIF)
	X9	0.755	1.324

The result of Collinearity Statistics (Table 4.9) indicates that tolerance value is not less than $1\text{-}R^2$ and the VIF value is not more than $1/\ 1\text{-}R^2$ in case of the regressors specific to each country as mentioned above. It can be seen from the above table that in case of Brazil and China, variable X2 has been dropped; in Russia, determinants X1 and X7 have been dropped, whereas, in the case of India and South Africa, none of the determinants are dropped, which clearly indicates that the remaining determinants are purely independent among each other. Thus, the remaining economic determinants have been selected to identify pair- wise causality between FDI inflows and economic growth using the Granger's causality test.

(C) Pair- wise Granger's Causality Test

The pair- wise Granger's causality test (Table 4.10) clearly explains the nature of relationship that exists between FDI inflows and economic growth (represented by only the economic determinants in this case) of all the five countries. The results derived of all the five countries are summarized as below:

Table 4.10: Results of Pair- wise Granger's Causality Test of economic determinants of all five BRICS countries

Null hypothesis	Results	Brazil	Russia	India	China	South Africa
X1 does not Granger Cause Y	F- Statistics Accepted/ Rejected Inference	0.0689 Accepted Independent	Dropped due to multi collinearity	0.7924 Accepted Independent	(5.3804)** Rejected X1 → Y	2.1609 Accepted Independent
Y does not Granger Cause X1	F- Statistics Accepted/ Rejected Inference	0.9536 Accepted Independent	Dropped due to multi collinearity	0.5351 Accepted Independent	0.2673 Accepted Independent	1.2060 Accepted Independent
X2 does not Granger Cause Y	F- Statistics Accepted/ Rejected Inference	Dropped due to multi collinearity	1.3165 Accepted Independent	0.4634 Accepted Independent	Dropped due to multi collinearity	1.8141 Accepted Independent
Y does not Granger Cause X2	F- Statistics Accepted/ Rejected Inference	Dropped due to multi collinearity	2.6098 Accepted Independent	0.1895 Accepted Independent	Dropped due to multi collinearity	1.7132 Accepted Independent
X3 does not Granger Cause Y	F- Statistics Accepted/ Rejected Inference	0.1053 Accepted Independent	0.0071 Accepted Independent	0.8015 Accepted Independent	0.8639 Accepted Independent	0.0728 Accepted Independent
Y does not Granger Cause X3	F- Statistics Accepted/ Rejected Inference	0.0220 Accepted Independent	0.0010 Accepted Independent	2.4082 Accepted Independent	(2.7367)*** Rejected Y → X3	1.1337 Accepted Independent
X4 does not Granger Cause Y	F- Statistics Accepted/ Rejected Inference	1.2060 Accepted Independent	1.5362 Accepted Independent	(2.8885)*** Rejected X4 → Y	0.4812 Accepted Independent	(3.3998)** Rejected X4 → Y
Y does not Granger Cause X4	F- Statistics	0.0070	1.0409	1.3519	0.8779	0.6456

Null hypothesis	Results	Brazil	Russia	India	China	South Africa
	Accepted/ Rejected Inference	Accepted Independent	Accepted Independent	Accepted Independent	Accepted Independent	Accepted Independent
X5 does not Granger Cause Y	F- Statistics Accepted/ Rejected Inference	(2.9322)*** Rejected X5 → Y	0.2662 Accepted Independent	0.1602 Accepted Independent	1.9962 Accepted Independent	(2.8842)*** Rejected X5 → Y
Y does not Granger Cause X5	F- Statistics Accepted/ Rejected Inference	0.2942 Accepted Independent	1.1395 Accepted Independent	(2.8851)*** Rejected Y → X5	0.5123 Accepted Independent	(5.1297)** Rejected Y → X5
X6 does not Granger Cause Y	F- Statistics Accepted/ Rejected Inference	1.1461 Accepted Independent	0.1473 Accepted Independent	0.2586 Accepted Independent	(5.3470)** Rejected X6 → Y	1.4158 Accepted Independent
Y does not Granger Cause X6	F- Statistics Accepted/ Rejected Inference	0.7046 Accepted Independent	1.7020 Accepted Independent	0.1088 Accepted Independent	1.3820 Accepted Independent	(3.8838)** Rejected Y → X6
X7 does not Granger Cause Y	F- Statistics Accepted/ Rejected Inference	0.1397 Accepted Independent	Dropped due to multi collinearity	0.1291 Accepted Independent	(3.3062)*** Rejected X7 → Y	1.2260 Accepted Independent
Y does not Granger Cause X7	F- Statistics Accepted/ Rejected Inference	0.0540 Accepted Independent	Dropped due to multi collinearity	0.4091 Accepted Independent	2.5117 Accepted Independent	0.7126 Accepted Independent
X8 does not Granger Cause Y	F- Statistics Accepted/ Rejected Inference	0.3137 Accepted Independent	(3.1826)*** Rejected X8 → Y	(2.6508)*** Rejected X8 → Y	0.0108 Accepted Independent	0.2383 Accepted Independent
Y does not Granger Cause X8	F- Statistics	0.0493	0.3684	0.4777	0.4133	0.13041

Null hypothesis	Results	Brazil	Russia	India	China	South Africa
	Accepted/ Rejected Inference	Accepted Independent	Accepted Independent	Accepted Independent	Accepted Independent	Accepted Independent
X9 does not Granger Cause Y	F- Statistics Accepted/ Rejected Inference	0.44760 Accepted Independent	2.8095 Accepted Independent	1.2674 Accepted Independent	0.0321 Accepted Independent	0.0475 Accepted Independent
Y does not Granger Cause X9	F- Statistics Accepted/ Rejected Inference	1.3368 Accepted Independent	0.9116 Accepted Independent	0.1971 Accepted Independent	0.1500 Accepted Independent	0.5238 Accepted Independent

Note: *, ** and *** indicate significance at one percent, five percent and ten percent level respectively.

(D) Findings

The above table on Granger's Causality test (Table 4.10) reveals that in case of Brazil, none of the determinants except trade openness attracts FDI inflows. The null hypothesis that X5 does not Granger Cause Y can be rejected at 10% level of significance, i.e. there is unidirectional causality running from the variable X5 (trade openness) to variable Y (FDI inflows). However, it is to be noted that out of all the five BRICS countries, Brazil stands at the last position in terms of its trade openness. This means that the measures taken by the Brazilian Government need to be stronger and strengthened in terms of liberalized import export policies that have worked well in fetching FDI inflows so far to this nation during this three decades period.

Therefore, it can be concluded that in case of Brazil, ***it is not FDI inflows that impact the economic growth rather it is the opposite, i.e. FDI inflows get impacted by the economic determinants representing economic growth.***

In the Russian context, international liquidity (measured in terms of import cover ratio) has succeeded in influencing FDI inflows, i.e. the Null Hypothesis X8 does not Granger Cause Y stands rejected at ten percent level of significance (unidirectional causality running from Import Cover Ratio to FDI inflows). Thus, it can be concluded that Russia should have enough foreign exchange reserves to cover its import payments so as to be able to attract more foreign investors to invest in this country in the form of FDI in future too. In case of Russia also, similar conclusion can be drawn like Brazil, i.e. ***it is not FDI inflows that impact the economic growth rather it is the opposite, i.e. FDI inflows get impacted by the economic determinants representing economic growth.***

India has a little different yet same story in terms of having causality between these economic determinants and FDI inflows. Unlike, Brazil and Russia, there are two different significant causations in India. Firstly, the null hypothesis X4 does not Granger Cause Y is rejected at ten percent level of significance (i.e. unidirectional causality running from unemployment rates to FDI inflows). In other words, unemployment rates are having a great influence in restraining the foreign investors to invest in India. This is also proven by the fact that India is among the top two countries in the BRICS consortium to have high level of unemployment rates (after South Africa) and thus having worsened effect on the inflows of FDI. Secondly, the good part of FDI inflows coming to India is this that it is able to improvise the position of trade openness in the Indian economy which is statistically significant at ten percent (Null Hypothesis Y does not Granger Cause X5 is rejected at 10% significance level). It implies unidirectional causality running from FDI inflows to trade openness which signals a better integration of Indian economy with the rest of the world. Lastly, like Russia, India too has a causation running from X8 to Y, i.e. unidirectional causality running from import cover ratio to FDI inflows (Null Hypothesis X8 does not Granger Cause Y is rejected at ten percent level of significance). However, India holds second last place in terms of holding greater foreign exchange reserves among the BRICS countries. In case of India, it can be concluded that it is both **FDI inflows that impact the economic growth and also vice versa.**

In China, there are four significant causations which are unique as compared to the previously discussed three countries. Firstly, null hypothesis X1 does not Granger

Cause Y is rejected at 5% level of significance which means that GDP growth rate influences the FDI inflows in China (unidirectional causality flowing from X1 to Y). It clearly confirms the fact that maximum FDI has flown to China in these last three decades because of largest market size and growth prospects of the Chinese economy. Secondly, the null hypothesis X6 does not Granger Cause Y is also rejected at 5% significance level (unidirectional causality running from X6 to Y), i.e. REER also contributes towards attracting more FDI inflows in China. Thirdly, Granger Causality test reveals that X7 does not Granger Cause Y is also rejected at 10% level of significance. It indicates that the gross capital formation rate in the Chinese economy is also a crucial factor in influencing the FDI inflows. Both these causalities (X6 and X7 causing Y) are also making sense because China is the leading country among all the other countries in the BRICS consortium in terms of REER and Gross Capital Formation annual growth rate. Last fact to be noticed in the context of China is the null hypothesis Y does not Granger Cause X3 getting rejected at 10% significance level i.e. unidirectional causality running from FDI inflows to inflation rates. In case of China also, like India, it can be concluded that it is both **FDI inflows that impact the economic growth and also vice versa.**

Like India, in the case of South Africa, it can be observed that the null hypothesis X4 does not Granger Cause Y is rejected at five percent level of significance (i.e. unidirectional causality running from unemployment rates to FDI inflows). This is also proven by the fact that South Africa is at the top in the BRICS consortium to have highest level of unemployment rates and thus affecting its level of FDI inflows. Another crucial factor for influencing FDI inflows, proven by many researchers in the past, is trade openness which is significantly affecting and getting affected by the FDI inflows as per Granger causality test in the context of South Africa (bidirectional causality flowing from X5 to Y and vice versa). The Null hypothesis X5 does not Granger Cause Y is rejected at 10% level of significance whereas null hypothesis Y does not Granger Cause X5 is rejected at 5% significance level. Lastly, it is proven by the Granger Causality test that FDI inflows coming into South Africa have a great impact on the REER because the null hypothesis Y does not Granger Cause X6 is also rejected at 5% level of significance (unidirectional causality running from Y to X6). In case of South Africa too, like India

and China, it can be concluded that it is both **FDI inflows that impact the economic growth and also vice versa.**

It should be noted here that the Granger Causality Test (Table 4.10 above) only provides inference as to the direction of causality and not about the positive/ negative change and the magnitude of effect between FDI inflows and economic growth (represented by economic determinants only) in this section. Therefore, to delve deeper into this issue, the present study also conducts a multiple regression analysis (considering economic determinants as independent variables and FDI inflows as dependent variable) of each of these five countries in the next chapter.

A similar procedure for testing the cause and effect relationship between FDI inflows and economic growth (represented by institutional determinants this time) is applied in the next section.

4.3.2 MODEL 2: ONLY INSTITUTIONAL DETERMINANTS

(A) Correlation Analysis for checking multicollinearity

Since the country risk ratings are used as a proxy for institutional determinants, it is to be noted that ratings are never tested for stationarity as they will lose their identity and originality upon conversion into other forms. Therefore, for applying the Granger's causality test to identify the direction of causality between FDI and economic growth (represented by all these institutional determinants), only the problem of multicollinearity is assessed. The existence of correlation among these determinants has been verified using correlation matrix before applying Granger's causality test. Following is the correlation matrix of each of the five countries of all the institutional determinants:

Table 4.11: Correlation Matrix of institutional determinants representing economic growth in Brazil

Correlations												
		Y	**X10**	**X11**	**X12**	**X13**	**X14**	**X15**	**X16**	**X17**	**X18**	**X19**
Y	Pearson Correlation	1	.012	-.034	.055	.008	.157	-.115	.077	.[a]	.[a]	.081
	Sig. (2-tailed)		.960	.883	.813	.974	.497	.621	.740	.	.	.727
	N	21	21	21	21	21	21	21	21	21	21	21
X10	Pearson Correlation	.012	1	.165	.727**	.598**	-.362	-.490*	.759**	.[a]	.[a]	.110
	Sig. (2-tailed)	.960		.474	.000	.004	.107	.024	.000	.	.	.634
	N	21	21	21	21	21	21	21	21	21	21	21
X11	Pearson Correlation	-.034	.165	1	.269	.093	.558**	-.157	-.169	.[a]	.[a]	.237

Correlations												
		Y	**X10**	**X11**	**X12**	**X13**	**X14**	**X15**	**X16**	**X17**	**X18**	**X19**
	Sig. (2-tailed)	.883	.474		.239	.690	.009	.498	.464	.	.	.302
	N	21	21	21	21	21	21	21	21	21	21	21
X12	Pearson Correlation	.055	.727**	.269	1	.857**	-.009	-.597**	.525*	.[a]	.[a]	.009
	Sig. (2-tailed)	.813	.000	.239		.000	.967	.004	.014	.	.	.967
	N	21	21	21	21	21	21	21	21	21	21	21
X13	Pearson Correlation	.008	.598**	.093	.857**	1	-.214	-.431	.460*	.[a]	.[a]	.101
	Sig. (2-tailed)	.974	.004	.690	.000		.352	.051	.036	.	.	.662
	N	21	21	21	21	21	21	21	21	21	21	21
X14	Pearson Correlation	.157	-.362	.558**	-.009	-.214	1	.221	-.246	.[a]	.[a]	-.080
	Sig. (2-tailed)	.497	.107	.009	.967	.352		.336	.283	.	.	.730
	N	21	21	21	21	21	21	21	21	21	21	21
X15	Pearson Correlation	-.115	-.490*	-.157	-.597**	-.431	.221	1	-.136	.[a]	.[a]	-.172
	Sig. (2-tailed)	.621	.024	.498	.004	.051	.336		.558	.	.	.455
	N	21	21	21	21	21	21	21	21	21	21	21
X16	Pearson Correlation	.077	.759**	-.169	.525*	.460*	-.246	-.136	1	.[a]	.[a]	-.085
	Sig. (2-tailed)	.740	.000	.464	.014	.036	.283	.558		.	.	.714
	N	21	21	21	21	21	21	21	21	21	21	21
X17	Pearson Correlation	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]
	Sig. (2-tailed)	.	.	.	.	.	.	.	.		.	.
	N	21	21	21	21	21	21	21	21	21	21	21
X18	Pearson Correlation	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]
	Sig. (2-tailed)	.	.	.	.	.	.	.	.	.		.
	N	21	21	21	21	21	21	21	21	21	21	21
X19	Pearson Correlation	.081	.110	.237	.009	.101	-.080	-.172	-.085	.[a]	.[a]	1
	Sig. (2-tailed)	.727	.634	.302	.967	.662	.730	.455	.714	.	.	
	N	21	21	21	21	21	21	21	21	21	21	21
**. Correlation is significant at the 0.01 level (2-tailed).												
*. Correlation is significant at the 0.05 level (2-tailed).												
a. Cannot be computed because at least one of the determinants is constant.												

Table 4.12: Correlation Matrix of institutional determinants representing economic growth in Russia

Correlations												
		Y	**X10**	**X11**	**X12**	**X13**	**X14**	**X15**	**X16**	**X17**	**X18**	**X19**
Y	Pearson Correlation	1	.013	-.004	-.031	.132	.072	.024	.014	-.009	.002	.129
	Sig. (2-tailed)		.955	.987	.893	.570	.758	.916	.953	.968	.993	.576
	N	21	21	21	21	21	21	21	21	21	21	21
X10	Pearson Correlation	.013	1	.459*	-.154	.333	-.691**	.114	-.200	-.887**	-.104	-.135

Correlations												
		Y	**X10**	**X11**	**X12**	**X13**	**X14**	**X15**	**X16**	**X17**	**X18**	**X19**
	Sig. (2-tailed)	.955		.036	.505	.140	.001	.624	.386	.000	.653	.560
	N	21	21	21	21	21	21	21	21	21	21	21
X11	Pearson Correlation	-.004	.459*	1	.559**	-.180	-.273	.344	.277	-.204	.648**	.447*
	Sig. (2-tailed)	.987	.036		.008	.435	.232	.127	.225	.374	.001	.042
	N	21	21	21	21	21	21	21	21	21	21	21
X12	Pearson Correlation	-.031	-.154	.559**	1	-.191	.236	.130	.636**	.332	.710**	.437*
	Sig. (2-tailed)	.893	.505	.008		.406	.302	.574	.002	.141	.000	.048
	N	21	21	21	21	21	21	21	21	21	21	21
X13	Pearson Correlation	.132	.333	-.180	-.191	1	-.395	.151	-.331	-.594**	-.410	-.569**
	Sig. (2-tailed)	.570	.140	.435	.406		.076	.513	.143	.005	.065	.007
	N	21	21	21	21	21	21	21	21	21	21	21
X14	Pearson Correlation	.072	-.691**	-.273	.236	-.395	1	.252	.587**	.786**	.095	.552**
	Sig. (2-tailed)	.758	.001	.232	.302	.076		.271	.005	.000	.684	.009
	N	21	21	21	21	21	21	21	21	21	21	21
X15	Pearson Correlation	.024	.114	.344	.130	.151	.252	1	.219	-.047	-.123	.207
	Sig. (2-tailed)	.916	.624	.127	.574	.513	.271		.341	.841	.596	.367
	N	21	21	21	21	21	21	21	21	21	21	21
X16	Pearson Correlation	.014	-.200	.277	.636**	-.331	.587**	.219	1	.541*	.610**	.786**
	Sig. (2-tailed)	.953	.386	.225	.002	.143	.005	.341		.011	.003	.000
	N	21	21	21	21	21	21	21	21	21	21	21
X17	Pearson Correlation	-.009	-.887**	-.204	.332	-.594**	.786**	-.047	.541*	1	.388	.535*
	Sig. (2-tailed)	.968	.000	.374	.141	.005	.000	.841	.011		.082	.012
	N	21	21	21	21	21	21	21	21	21	21	21
X18	Pearson Correlation	.002	-.104	.648**	.710**	-.410	.095	-.123	.610**	.388	1	.660**
	Sig. (2-tailed)	.993	.653	.001	.000	.065	.684	.596	.003	.082		.001
	N	21	21	21	21	21	21	21	21	21	21	21
X19	Pearson Correlation	.129	-.135	.447*	.437*	-.569**	.552**	.207	.786**	.535*	.660**	1
	Sig. (2-tailed)	.576	.560	.042	.048	.007	.009	.367	.000	.012	.001	
	N	21	21	21	21	21	21	21	21	21	21	21
*. Correlation is significant at the 0.05 level (2-tailed).												
**. Correlation is significant at the 0.01 level (2-tailed).												

Table 4.13: Correlation Matrix of institutional determinants representing economic growth in India

Correlations												
		Y	**X10**	**X11**	**X12**	**X13**	**X14**	**X15**	**X16**	**X17**	**X18**	**X19**
Y	Pearson Correlation	1	.[a]	.016	.224	.186	-.283	-.277	.[a]	-.035	.091	-.065
	Sig. (2-tailed)		.	.946	.330	.419	.214	.224	.	.880	.696	.781

Correlations												
		Y	**X10**	**X11**	**X12**	**X13**	**X14**	**X15**	**X16**	**X17**	**X18**	**X19**
	N	21	21	21	21	21	21	21	21	21	21	21
X10	Pearson Correlation	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]
	Sig. (2-tailed)	.		.	.	.	.	.	.	.	.	.
	N	21	21	21	21	21	21	21	21	21	21	21
X11	Pearson Correlation	.016	.[a]	1	-.065	-.040	.082	.316	.[a]	.290	.808**	.645**
	Sig. (2-tailed)	.946	.		.779	.862	.723	.163	.	.203	.000	.002
	N	21	21	21	21	21	21	21	21	21	21	21
X12	Pearson Correlation	.224	.[a]	-.065	1	.620**	-.188	-.316	.[a]	-.096	.258	.072
	Sig. (2-tailed)	.330	.	.779		.003	.414	.163	.	.680	.258	.756
	N	21	21	21	21	21	21	21	21	21	21	21
X13	Pearson Correlation	.186	.[a]	-.040	.620**	1	-.648**	.197	.[a]	.164	.281	.141
	Sig. (2-tailed)	.419	.	.862	.003		.001	.392	.	.477	.218	.543
	N	21	21	21	21	21	21	21	21	21	21	21
X14	Pearson Correlation	-.283	.[a]	.082	-.188	-.648**	1	-.161	.[a]	-.021	-.057	-.254
	Sig. (2-tailed)	.214	.	.723	.414	.001		.487	.	.926	.806	.267
	N	21	21	21	21	21	21	21	21	21	21	21
X15	Pearson Correlation	-.277	.[a]	.316	-.316	.197	-.161	1	.[a]	.690**	.404	.418
	Sig. (2-tailed)	.224	.	.163	.163	.392	.487		.	.001	.069	.059
	N	21	21	21	21	21	21	21	21	21	21	21
X16	Pearson Correlation	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]
	Sig. (2-tailed)	.	.	.	.	.	.	.		.	.	.
	N	21	21	21	21	21	21	21	21	21	21	21
X17	Pearson Correlation	-.035	.[a]	.290	-.096	.164	-.021	.690**	.[a]	1	.563**	.556**
	Sig. (2-tailed)	.880	.	.203	.680	.477	.926	.001	.		.008	.009
	N	21	21	21	21	21	21	21	21	21	21	21
X18	Pearson Correlation	.091	.[a]	.808**	.258	.281	-.057	.404	.[a]	.563**	1	.709**
	Sig. (2-tailed)	.696	.	.000	.258	.218	.806	.069	.	.008		.000
	N	21	21	21	21	21	21	21	21	21	21	21
X19	Pearson Correlation	-.065	.[a]	.645**	.072	.141	-.254	.418	.[a]	.556**	.709**	1
	Sig. (2-tailed)	.781	.	.002	.756	.543	.267	.059	.	.009	.000	
	N	21	21	21	21	21	21	21	21	21	21	21

**. Correlation is significant at the 0.01 level (2-tailed).

a. Cannot be computed because at least one of the determinants is constant.

Table 4.14: Correlation Matrix of institutional determinants representing economic growth in China

Correlations												
		Y	**X10**	**X11**	**X12**	**X13**	**X14**	**X15**	**X16**	**X17**	**X18**	**X19**
Y	Pearson Correlation	1	-.058	-.096	-.031	-.142	-.006	.202	-.091	.195	-.017	.214
	Sig. (2-tailed)		.804	.678	.896	.540	.980	.381	.694	.398	.943	.351
	N	21	21	21	21	21	21	21	21	21	21	21
X10	Pearson Correlation	-.058	1	.689**	.333	.012	-.825**	.293	.343	-.308	.324	-.039
	Sig. (2-tailed)	.804		.001	.140	.960	.000	.198	.128	.174	.152	.865
	N	21	21	21	21	21	21	21	21	21	21	21
X11	Pearson Correlation	-.096	.689**	1	.087	-.096	-.681**	.066	.516*	.159	.659**	.320
	Sig. (2-tailed)	.678	.001		.709	.680	.001	.776	.017	.491	.001	.158
	N	21	21	21	21	21	21	21	21	21	21	21
X12	Pearson Correlation	-.031	.333	.087	1	.325	-.216	.742**	.206	-.095	.141	-.082
	Sig. (2-tailed)	.896	.140	.709		.151	.347	.000	.370	.681	.541	.725
	N	21	21	21	21	21	21	21	21	21	21	21
X13	Pearson Correlation	-.142	.012	-.096	.325	1	-.105	.332	-.129	.045	-.115	.023
	Sig. (2-tailed)	.540	.960	.680	.151		.650	.141	.578	.846	.618	.921
	N	21	21	21	21	21	21	21	21	21	21	21
X14	Pearson Correlation	-.006	-.825**	-.681**	-.216	-.105	1	-.144	-.198	-.025	-.371	-.373
	Sig. (2-tailed)	.980	.000	.001	.347	.650		.533	.390	.914	.097	.096
	N	21	21	21	21	21	21	21	21	21	21	21
X15	Pearson Correlation	.202	.293	.066	.742**	.332	-.144	1	.194	-.119	.171	-.161
	Sig. (2-tailed)	.381	.198	.776	.000	.141	.533		.399	.606	.460	.485
	N	21	21	21	21	21	21	21	21	21	21	21
X16	Pearson Correlation	-.091	.343	.516*	.206	-.129	-.198	.194	1	-.352	.864**	-.172
	Sig. (2-tailed)	.694	.128	.017	.370	.578	.390	.399		.118	.000	.455
	N	21	21	21	21	21	21	21	21	21	21	21
X17	Pearson Correlation	.195	-.308	.159	-.095	.045	-.025	-.119	-.352	1	-.074	.765**
	Sig. (2-tailed)	.398	.174	.491	.681	.846	.914	.606	.118		.750	.000
	N	21	21	21	21	21	21	21	21	21	21	21
X18	Pearson Correlation	-.017	.324	.659**	.141	-.115	-.371	.171	.864**	-.074	1	.232
	Sig. (2-tailed)	.943	.152	.001	.541	.618	.097	.460	.000	.750		.311
	N	21	21	21	21	21	21	21	21	21	21	21
X19	Pearson Correlation	.214	-.039	.320	-.082	.023	-.373	-.161	-.172	.765**	.232	1
	Sig. (2-tailed)	.351	.865	.158	.725	.921	.096	.485	.455	.000	.311	
	N	21	21	21	21	21	21	21	21	21	21	21
**. Correlation is significant at the 0.01 level (2-tailed).												
*. Correlation is significant at the 0.05 level (2-tailed).												

Table 4.15: Correlation Matrix of institutional determinants representing economic growth in South Africa

Correlations												
		Y	**X10**	**X11**	**X12**	**X13**	**X14**	**X15**	**X16**	**X17**	**X18**	**X19**
Y	Pearson Correlation	1	.124	.152	.084	.232	.140	.325	.068	.300	.184	-.002
	Sig. (2-tailed)		.591	.510	.718	.312	.544	.151	.769	.187	.426	.993
	N	21	21	21	21	21	21	21	21	21	21	21
X10	Pearson Correlation	.124	1	.956**	.596**	.843**	-.340	.761**	.795**	.132	.577**	.824**
	Sig. (2-tailed)	.591		.000	.004	.000	.131	.000	.000	.567	.006	.000
	N	21	21	21	21	21	21	21	21	21	21	21
X11	Pearson Correlation	.152	.956**	1	.464*	.711**	-.272	.675**	.723**	.237	.753**	.877**
	Sig. (2-tailed)	.510	.000		.034	.000	.233	.001	.000	.300	.000	.000
	N	21	21	21	21	21	21	21	21	21	21	21
X12	Pearson Correlation	.084	.596**	.464*	1	.805**	-.641**	.761**	.762**	.447*	-.115	.472*
	Sig. (2-tailed)	.718	.004	.034		.000	.002	.000	.000	.042	.621	.031
	N	21	21	21	21	21	21	21	21	21	21	21
X13	Pearson Correlation	.232	.843**	.711**	.805**	1	-.442*	.788**	.736**	.238	.188	.582**
	Sig. (2-tailed)	.312	.000	.000	.000		.045	.000	.000	.300	.414	.006
	N	21	21	21	21	21	21	21	21	21	21	21
X14	Pearson Correlation	.140	-.340	-.272	-.641**	-.442*	1	-.492*	-.479*	-.025	.178	-.384
	Sig. (2-tailed)	.544	.131	.233	.002	.045		.024	.028	.913	.441	.086
	N	21	21	21	21	21	21	21	21	21	21	21
X15	Pearson Correlation	.325	.761**	.675**	.761**	.788**	-.492*	1	.891**	.327	.278	.630**
	Sig. (2-tailed)	.151	.000	.001	.000	.000	.024		.000	.148	.223	.002
	N	21	21	21	21	21	21	21	21	21	21	21
X16	Pearson Correlation	.068	.795**	.723**	.762**	.736**	-.479*	.891**	1	.330	.359	.778**
	Sig. (2-tailed)	.769	.000	.000	.000	.000	.028	.000		.145	.110	.000
	N	21	21	21	21	21	21	21	21	21	21	21
X17	Pearson Correlation	.300	.132	.237	.447*	.238	-.025	.327	.330	1	.229	.234
	Sig. (2-tailed)	.187	.567	.300	.042	.300	.913	.148	.145		.317	.308
	N	21	21	21	21	21	21	21	21	21	21	21
X18	Pearson Correlation	.184	.577**	.753**	-.115	.188	.178	.278	.359	.229	1	.736**
	Sig. (2-tailed)	.426	.006	.000	.621	.414	.441	.223	.110	.317		.000
	N	21	21	21	21	21	21	21	21	21	21	21
X19	Pearson Correlation	-.002	.824**	.877**	.472*	.582**	-.384	.630**	.778**	.234	.736**	1
	Sig. (2-tailed)	.993	.000	.000	.031	.006	.086	.002	.000	.308	.000	
	N	21	21	21	21	21	21	21	21	21	21	21
**. Correlation is significant at the 0.01 level (2-tailed).												
*. Correlation is significant at the 0.05 level (2-tailed).												

As per the available literature, if the value of Pearson correlation coefficient is more than 0.8, then those determinants are highly correlated. It can be seen from the above tables of correlation matrix (Tables 4.11- 4.15) that in Brazil (Table 4.11), determinants X12 and X13 are correlated with each other with their correlation coefficients as more than 0.8. In the case of Russia (Table 4.12), determinants X10 and X17 are found to be correlated with each other. In India (Table 4.13), determinants X11 and X18 are correlated with each other whereas in China (Table 4.14), determinants X10 and X14, X16 and X18 are correlated with each other. Lastly, in case of South Africa (Table 4.15) X10 is correlated with X11, X13 and X19 and vice versa; X12 and X13 and X15 and X16 are also found to be correlated with each other.

Furthermore, in order to confirm whether the selected institutional determinants are free from the problem of multicollinearity, VIF and tolerance level have been used. If individual VIF is more than 5, mean VIF and Tolerance level is lesser than 0.2, then it means that those determinants are highly correlated. Such determinants may be dropped from the model until the VIF values and Tolerance level come within the desired range.

After a number of iterations, following are the remaining determinants with their VIFs and Tolerance level in each country's model after dropping those determinants which were highly correlated:

Table 4.16: Collinearity Statistics of remaining institutional determinants used for Granger's Causality in the context of individual BRICS countries

Name of the countries	Determinants	Tolerance Level	Variance Inflation Factor (VIF)
Brazil	**X11**	0.531	1.881
	X13	0.624	1.603
	X14	0.537	1.862
	X15	0.734	1.363
	X16	0.730	1.369
	X19	0.866	1.155
Russia	**X12**	0.553	1.807
	X13	0.527	1.896
	X14	0.547	1.829

Name of the countries	Determinants	Tolerance Level	Variance Inflation Factor (VIF)
	X15	0.802	1.248
	X16	0.220	4.538
	X19	0.256	3.912
India	**X11**	0.470	2.127
	X12	0.791	1.264
	X14	0.704	1.421
	X15	0.399	2.508
	X17	0.370	2.702
	X19	0.336	2.972
China	**X11**	0.259	3.866
	X12	0.418	2.393
	X13	0.811	1.233
	X14	0.295	3.394
	X15	0.421	2.374
	X16	0.420	2.384
	X17	0.237	4.225
	X19	0.258	3.881
South Africa	**X13**	0.364	2.747
	X14	0.723	1.383
	X15	0.301	3.324
	X17	0.865	1.156
	X19	0.576	1.735

It can be seen from the above table that in case of Brazil determinants X10, X12, X17 and X18 have been dropped. In Russia, determinants X10, X11, X17 and X18 have been dropped. In India, determinants X10, X13, X16 and X18 have been dropped, whereas, in the case of China, determinants X10 and X18 are dropped, and in South Africa, determinants X10, X11, X12, X16 and X18 are dropped. It is noticeable that determinants X10 (bureaucracy quality) and X18 (religious tensions) are dropped in each

of the five countries whereas there are some other determinants which are dropped in each country differently so as to correct the problem of multicollinearity. Therefore, the results of determinants X10 and X18 are not present in further analysis. The remaining determinants are purely independent among each other and thus have been selected to identify pair- wise causality between FDI inflows and economic growth (represented by institutional determinants in this case) using the Granger's causality test.

(B) Pair- wise Granger's Causality Test

The pair- wise Granger's causality tests (Table 4.17) clearly explain the nature of relationship that exists between FDI inflows and economic growth (represented by institutional determinants) of all the five countries. The results derived of all the five countries are summarized as below:

Table 4.17: Results of Pair- wise Granger's Causality Test of institutional determinants of all five BRICS countries

Null hypothesis	Results	Brazil	Russia	India	China	South Africa
X10 does not Granger Cause Y	F- Statistics Accepted/ Rejected Inference	Dropped due to multi collinearity	Dropped due to multi collinearity	Dropped due to multi collinearity	Dropped due to multi collinearity	Dropped due to multi collinearity
Y does not Granger Cause X10	F- Statistics Accepted/ Rejected Inference	Dropped due to multi collinearity	Dropped due to multi collinearity	Dropped due to multi collinearity	Dropped due to multi collinearity	Dropped due to multi collinearity
X11 does not Granger Cause Y	F- Statistics Accepted/ Rejected Inference	0.0729 Accepted Independent	Dropped due to multi collinearity	0.0005 Accepted Independent	0.0002 Accepted Independent	Dropped due to multi collinearity
Y does not Granger Cause X11	F- Statistics Accepted/ Rejected	0.0041 Accepted	Dropped due to multi collinearity	0.0653 Accepted	0.9776 Accepted	Dropped due to multi collinearity

Null hypothesis	Results	Brazil	Russia	India	China	South Africa
	Inference	Independent		Independent	Independent	
X12 does not Granger Cause Y	F- Statistics Accepted/ Rejected Inference	Dropped due to multi collinearity	0.0908 Accepted Independent	1.1795 Accepted Independent	0.8352 Accepted Independent	Dropped due to multi collinearity
Y does not Granger Cause X12	F- Statistics Accepted/ Rejected Inference	Dropped due to multi collinearity	0.0638 Accepted Independent	0.0737 Accepted Independent	0.6508 Accepted Independent	Dropped due to multi collinearity
X13 does not Granger Cause Y	F- Statistics Accepted/ Rejected Inference	0.1194 Accepted Independent	1.2386 Accepted Independent	Dropped due to multi collinearity	0.0007 Accepted Independent	0.0700 Accepted Independent
Y does not Granger Cause X13	F- Statistics Accepted/ Rejected Inference	0.0062 Accepted Independent	1.5759 Accepted Independent	Dropped due to multi collinearity	0.0276 Accepted Independent	1.9873 Accepted Independent
X14 does not Granger Cause Y	F- Statistics Accepted/ Rejected Inference	0.1506 Accepted Independent	0.0021 Accepted Independent	0.1897 Accepted Independent	0.0001 Accepted Independent	0.2343 Accepted Independent
Y does not Granger Cause X14	F- Statistics Accepted/ Rejected Inference	0.2146 Accepted Independent	0.0238 Accepted Independent	0.7597 Accepted Independent	0.1049 Accepted Independent	2.5926 Accepted Independent
X15 does not Granger Cause Y	F- Statistics Accepted/ Rejected	0.11006 Accepted	0.00273 Accepted	0.07259 Accepted	0.00629 Accepted	0.06516 Accepted

Null hypothesis	Results	Brazil	Russia	India	China	South Africa
	Inference	Independent	Independent	Independent	Independent	Independent
Y does not Granger Cause X15	F- Statistics Accepted/ Rejected Inference	0.97996 Accepted Independent	1.46349 Accepted Independent	0.26560 Accepted Independent	1.45090 Accepted Independent	1.27922 Accepted Independent
X16 does not Granger Cause Y	F- Statistics Accepted/ Rejected Inference	0.31961 Accepted Independent	0.000077 Accepted Independent	Dropped due to multi collinearity	0.28480 Accepted Independent	Dropped due to multi collinearity
Y does not Granger Cause X16	F- Statistics Accepted/ Rejected Inference	0.02859 Accepted Independent	0.00140 Accepted Independent	Dropped due to multi collinearity	0.02221 Accepted Independent	Dropped due to multi collinearity
X17 does not Granger Cause Y	F- Statistics Accepted/ Rejected Inference	Dropped due to multi collinearity	Dropped due to multi collinearity	0.07624 Accepted Independent	1.33390 Accepted Independent	0.61532 Accepted Independent
Y does not Granger Cause X17	F- Statistics Accepted/ Rejected Inference	Dropped due to multi collinearity	Dropped due to multi collinearity	0.08309 Accepted Independent	0.000065 Accepted Independent	0.52373 Accepted Independent
X18 does not Granger Cause Y	F- Statistics Accepted/ Rejected Inference	Dropped due to multi collinearity	Dropped due to multi collinearity	Dropped due to multi collinearity	Dropped due to multi collinearity	Dropped due to multi collinearity
Y does not Granger Cause X18	F- Statistics Accepted/ Rejected	Dropped due to multi collinearity	Dropped due to multi collinearity	Dropped due to multi collinearity	Dropped due to multi collinearity	Dropped due to multi collinearity

Null hypothesis	Results	Brazil	Russia	India	China	South Africa
	Inference					
X19 does not Granger Cause Y	F- Statistics Accepted/ Rejected Inference	0.43779 Accepted Independent	0.01343 Accepted Independent	0.48263 Accepted Independent	1.11444 Accepted Independent	0.10110 Accepted Independent
Y does not Granger Cause X19	F- Statistics Accepted/ Rejected Inference	0.24915 Accepted Independent	0.06883 Accepted Independent	0.83833 Accepted Independent	0.33459 Accepted Independent	0.04649 Accepted Independent

(C) Findings

The above table on Granger's Causality test reveals that there is no unidirectional/ bi-directional causality between the FDI inflows and economic growth (represented by the institutional determinants) in any of the five countries during the given period under study.

4.4 Summary of results derived for Objective 1 (Model 1- Table 4.10 and Model 2- Table 4.17 discussed above in this chapter):

Table 4.18: Summary of results derived for Objective 1

	MODEL 1: ECONOMIC DETERMINANTS ONLY	MODEL 2: INSTITUTIONAL DETERMINANTS ONLY
Brazil	**X5 → Y**	**NONE**
Inference	Unidirectional Granger Causality from X5 to Y i.e. Trade Openness Granger Causes FDI net inflows. It can be concluded that in case of Brazil, it is not FDI inflows that impact the economic growth rather it is the	Independence between Y and X10- X19. No causality exists between institutional determinants representing economic growth and FDI inflows.

	MODEL 1: ECONOMIC DETERMINANTS ONLY	MODEL 2: INSTITUTIONAL DETERMINANTS ONLY
	opposite, i.e. *FDI inflows get impacted by the economic determinants representing economic growth*	
Russia	**X8 → Y**	**NONE**
Inference	Unidirectional Granger Causality from X8 to Y i.e. International Liquidity Granger Causes FDI net inflows. In case of Russia also, it is not FDI inflows that impact the economic growth rather it is the opposite, i.e. *FDI inflows get impacted by the economic determinants representing economic growth.*	Independence between Y and X10- X19. No causality exists between institutional determinants representing economic growth and FDI inflows.
India	**X4 → Y; Y → X5; X8 → Y**	**NONE**
Inference	Unidirectional Granger Causality from X4 and X8 to Y i.e. Unemployment rates and International Liquidity Granger Causes FDI net inflows; also Unidirectional Granger Causality from Y to X5 i.e. FDI net inflows Granger Causes Trade Openness. Both FDI inflows and economic determinants representing economic growth impact each other. In case of India, it can be concluded that it is *both FDI inflows that impact the economic growth and also vice versa.*	Independence between Y and X10- X19. No causality exists between institutional determinants representing economic growth and FDI inflows.
China	**X1 → Y; Y → X3; X6 → Y; X7 → Y**	**NONE**

	MODEL 1: ECONOMIC DETERMINANTS ONLY	**MODEL 2: INSTITUTIONAL DETERMINANTS ONLY**
Inference	Unidirectional Granger Causality from X1, X6 and X7 to Y i.e. GDP, REER and GCF Granger Causes FDI net inflows; also Unidirectional Granger Causality from Y to X3 i.e. FDI net inflows Granger Causes Inflation Rates. Both FDI inflows and economic determinants representing economic growth impact each other. In case of China also, it can be concluded that it is *both FDI inflows that impact the economic growth and also vice versa.*	Independence between Y and X10- X19. No causality exists between institutional determinants representing economic growth and FDI inflows.
South Africa	**X4 → Y; X5 → Y; Y → X5; Y → X6**	**NONE**
Inference	Unidirectional Granger Causality from X4 to Y i.e. Unemployment Rates Granger Causes FDI net inflows; also Unidirectional Granger Causality from Y to X6 i.e. FDI net inflows Granger Causes REER; whereas Bidirectional Granger Causality between Y and X5 i.e. both Trade Openness and FDI net inflows Granger causes each other. Both FDI inflows and economic determinants representing economic growth impact each other. In case of South Africa too, like India and China, it can be concluded that it is *both FDI inflows that impact the economic growth and also vice versa.*	Independence between Y and X10- X19. No causality exists between institutional determinants representing economic growth and FDI inflows.

4.5 Conclusion

It should be noted here that the Granger's Causality Test has its own limitations i.e. it only provides inferences as to the direction of causality and not about the positive/ negative change and the magnitude of effect between the variables tested for causality. Moreover, it is also proven in this chapter that, in all the five countries, it is definitely FDI inflows that get impacted by the economic growth (represented by the economic determinants) and not the vice versa as in the case of Brazil and Russia (exception in case of India, China and South Africa where bi-directional causality is proven). However, no such causality is proven in case of FDI inflows getting impacted by the economic growth (represented by the institutional determinants). Therefore, the study tries to delve deeper into this issue and thus conducts a multiple regression analysis so as to find out the most significant reasons (both economic and institutional) responsible for this phenomenon along with their positive/ negative impact (determined by the sign of coefficient) and also their magnitude (estimated by the value of coefficient) for each of these five countries in the next chapter.

CHAPTER-5
(ANALYSIS: II)

CHAPTER: 5- DETERMINANTS OF FDI INFLOWS IN INDIVIDUAL BRICS NATIONS

5.1 Introduction

The cause and effect relationship is well proven in the previous chapter with the help of results derived from Granger's Causality Test. This chapter tries to explore further the reasons for such strong/ weak/ no link between FDI inflows and economic growth with the help of fitting a Regression Model taking FDI inflows as dependent variable and both economic and institutional determinants as independent variables (as identified in the Literature Review chapter earlier affecting FDI inflows).

This chapter helps to throw light on some very important issues affecting all the five countries of the group such as if FDI inflows impact economic growth positively in any of the countries (as per the Granger's Causality test), then how can these countries try to strengthen this impact. The obvious way out is to attract more such FDI inflows by identifying and acting rigorously on the determinants affecting it positively so that it in turns positively impacts the economic growth in long run.

On the contrary, if there are countries in the BRICS which are seeing that it is rather the economic growth (represented by economic and institutional determinants) that impacts the FDI inflows, then also this chapter helps the policy makers to understand how can these determinants of economic growth be improvised in future so as to make these countries as the most attractive destinations for FDI in the world.

And lastly, if no cause and effect relationship between the FDI inflows and economic growth (like in case of institutional determinants) is proven, then this chapter helps to identify those reasons and finally provides recommendations to such countries so that all these five countries can join hands together to keep the momentum high and remain among the top destinations of the world for attracting foreign investors and improve not just their growth levels but also the overall economic development.

This chapter uses the following two models for ascertaining the positive/ negative change and magnitude of association between these economic and institutional determinants and FDI inflows in BRICS countries individually.

5.2 Models specification:

Model 1:

$$Y_{it} = \alpha + \beta_1 X1_{it} + \beta_2 X2_{it} + \beta_3 X3_{it} + \beta_4 X4_{it} + \beta_5 X5_{it} + \beta_6 X6_{it} + \beta_7 X7_{it} + \beta_8 X8_{it} + \beta_9 X9_{it} + \mu_{it} \ldots\ldots (1)$$

The above model includes only economic determinants as independent variables and FDI inflows as dependent variable.

Model 2:

$$Y_{it} = \alpha + \lambda_1 X10_{it} + \lambda_2 X11_{it} + \lambda_3 X12_{it} + \lambda_4 X13_{it} + \lambda_5 X14_{it} + \lambda_6 X15_{it} + \lambda_7 X16_{it} + \lambda_8 X17_{it} + \lambda_9 X18_{it} + \lambda_{10} X19_{it} + \varepsilon_{it} \ldots\ldots (2)$$

The above model includes only institutional determinants as independent variables and FDI inflows as dependent variable.

The impact of economic determinants on FDI inflows can be better understood with the help of OLS model discussed here under. The same technique has been applied by various researchers in the past for estimating the magnitude of changes from various independent determinants to FDI inflows. Some of such studies were conducted by Hasli et al. (2014) in the context of China, Singapore and Malaysia; by Panigrahi and Panda (2012) for three countries India, China and Malaysia; by Azam and Lukman (2010) for India, Indonesia and Pakistan; and by Asiedu (2002) from the perspective of African countries.

5.3 Assumptions of Multiple Regression Analysis:

For arriving at the results of multiple regression analysis, following assumptions of a Classical Linear Regression Model (CLRM) are tested and any deviations whatsoever are corrected with the help of certain procedures defined as under:

1. *Stationarity*- checked with Augmented Dickey Fuller (ADF) test. Corrected with first/ second differencing or log growth series. These tests are conducted with the help of E- views (Version 7.0) software.
2. *Multicollinearity*- checked with Variance Inflation Factor (VIF) and tolerance level. Corrected by dropping the determinants till the time each variable has VIF value lesser than 5. These tests are conducted with the help of SPSS software (Version 21).
3. *Normality*- checked with Jarque Bera test statistic and next with Shapiro- Wilk (1965) Test of Normality. Corrected by removing the outliers from the specific data series

with the help of identifying them in Boxplot graphs. These tests are conducted with the help of E-views software (Version 7.0) and SPSS software (Version 21) respectively.

4. *Heteroskedasticity*- checked with Breusch-Pagan (1979) -Godfrey (1978) test. Corrected by running linear regression with robust standard errors. These tests are conducted with the help of STATA (Version 12.0) software.
5. *Serial Correlation*- checked with Breusch (1978) - Godfrey (1978) Serial Correlation LM Test: Corrected by running linear regression with robust standard errors. These tests are conducted with the help of STATA (Version 12.0) software.
6. *Autocorrelation*- checked with Durbin- Watson (1950, 1951) statistic. Corrected by running linear regression with robust standard errors. These tests are conducted with the help of STATA (Version 12.0) software.

5.4 Empirical Results and Discussions

5.4.1 MODEL 1: ONLY ECONOMIC DETERMINANTS

(A.) Testing the assumptions of CLRM

Out of the above mentioned six assumptions, first two assumptions of stationarity and multicollinearity have already been tested in the previous chapter. The third assumption of normality is tested with the help of Shapiro- Wilk test. While the Shapiro-Wilk test was conducted, all those variables which were showing a significant value of less than 0.05, of the Shapiro- Wilk statistic, were identified and then the outliers were removed from those data series using the Box-plot Graphs prepared in the SPSS software. Once this process of removing outliers was done, the data series became normally distributed to be used for the regression model. Thereafter, residual diagnostics of the regression model was conducted to test the last three assumptions mentioned above and if any problems of either serial correlation or heteroskedasticity or non- normality of residuals or all were also detected, then either a simple OLS Model or an OLS Model with robust standard errors was run to remove these problems.

(B.) Results of OLS or OLS Robust Models

Following table represents the results of multiple regression analysis conducted with the help of OLS or OLS robust technique (as the case may be). It consists of

economic determinants affecting FDI inflows for the period of 33 years (1983- 2015) for Brazil, India, China and South Africa whereas 21 years (1995- 2015) for Russia.

Table 5.1: Result of OLS or OLS Robust Model (Economic determinants affecting FDI inflows in Brazil, Russia, India, China and South Africa individually)

Countries →	**Brazil (OLS)**	**Russia (OLS Robust)**	**India (OLS Robust)**	**China (OLS Robust)**	**South Africa (OLS Robust)**
Independent Determinants	**Coefficients (t-statistics)**	**Coefficients (t-statistics)**	**Coefficients (t-statistics)**	**Coefficients (t-statistics)**	**Coefficients (t-statistics)**
Intercept	7.9835 (0.72)	2.3599 (0.89)	0.0857 (0.28)	0.0382 (0.85)	-0.1660 (-0.24)
X1	2.1391 (1.29)	Dropped due to multi-collinearity	-1.1038 (-6.15)**	0.3678 (0.83)	0.0167 (0.04)
X2	Dropped due to multi-collinearity	-0.7248 (-1.85)***	-0.1608 (-1.67)	Dropped due to multi-collinearity	-18.4630 (-0.67)
X3	-0.0143 (-2.46)**	-0.0279 (-1.44)	0.5616 (2.64)	0.0197 (4.45)*	0.1764 (0.72)
X4	-20.5063 (-0.83)	3.8046 (1.65)	-312.6346 (-1.44)	0.3695 (0.30)	0.9498 (0.19)
X5	93.8110 (2.63)**	9.7153 (0.29)	-0.9578 (-0.54)	0.9292 (1.90)***	11.8830 (0.96)
X6	75.6172 (2.97)**	0.1046 (0.32)	-12.9350 (-3.05)***	1.9652 (2.63)**	-3.0179 (-0.46)
X7	-0.4454 (-1.11)	Dropped due to multi-collinearity	0.0132 (2.97)***	-0.0557 (-0.37)	0.0226 (0.36)
X8	19.8201 (2.24)**	8.6171 (0.99)	-2.2186 (-5.14)**	0.4486 (1.86)***	1.4676 (0.89)

X9	-19.6916 (-2.88)**	-3.4774 (-5.45)*	0.0243 (0.88)	-0.0691 (-0.72)	0.8481 (0.27)
LagY= Y(-1)	-0.0893 (-0.39)	-	-	-	-0.8399 (-2.87)**
LagY1= Y(-2)	-	-	-	-	-0.4814 (-1.85)***
LagY2= Y(-3)	-	-	-	-	-0.5036 (-2.16)**
LagX1= X1(-1)	-6.1227 (-1.33)	-	-	-	0.2219 (0.75)
LagX2= X2(-1)	223.9083 (1.17)	-	-	-	-
LagX3= X3(-1)	0.0066 (0.98)	-	-	-	-
LagX4= X4(-1)	34.3812 (1.58)	-	-	-	-
LagX5= X5(-1)	-113.1939 (-2.67)**	-	-	-	-
LagX6= X6(-1)	-17.9149 (-0.54)	-	-	-	-
LagX7= X7(-1)	1.0349 (1.98)***	-	-	-	-
LagX8= X8(-1)	3.0863 (0.34)	-	-	-	-
LagX9= X9(-1)	-2.6263 (-0.43)	-	-	-	-
R-squared	0.7750	0.8001	0.9491	0.7651	0.6053
Adjusted R-squared	0.4635	0.6925	0.7199	0.5303	0.2846
F-statistic	2.49**	16.74*	110.17*	15.52*	2.55**
Prob.(F-statistic)	0.0497	0.0000	0.0090	0.0004	0.0393

Durbin-Watson statistic	2.24	2.32	2.52	3.28	1.86

Notes: 1. *, ** and *** denote the significance at one, five and ten percent level, respectively. 2. Figures in parentheses are t-statistics

The descriptive statistics of both the dependent variable (Y) and independent economic variables (X1-X9) (Table 5.6 and 5.9 respectively), the results of Shapiro-Wilk test of normality (Table 5.7 and 5.10 respectively), and the name of outliers removed from the data series with the help of Box- plot graph (Table 5.8 and 5.11 respectively), for India and China are shown as Appendix-I at the end of thesis.

The results of multiple regression models as per Table 5.1 above are explained as under for each of the five countries in the consortium one after another:

1. Brazil

It can be seen that in case of Brazil, FDI inflows gets impacted by various independent determinants that are significant at various levels. Variable X3, inflation rates, negatively affects the FDI inflows i.e. a one percent change in inflation rates leads to downfall in FDI inflows in Brazil by 0.01%. Another significant factor is variable X5, trade openness, which has a positive influence on FDI inflows coming into Brazil. A one percent change in trade openness i.e. ratio of export plus import vis-à-vis GDP of the country, leads to a 93.81% change in FDI inflows. This is in conformity with results of Granger's Causality test conducted for Brazil above in Table 10. On the similar lines, variable X6 is also extremely useful in explaining the change in FDI inflows (one percent change in REER leads to 75.62% increase in FDI inflows) in Brazil. This is simply because of increase in expectations of future profitability in terms of the home currency. Better financial health of a country which is indicated by variable X8 i.e. international liquidity also induces FDI inflows in Brazil by 19.82%. However, as expected, a negative and significant relationship can be seen between variable X9 (labour cost) and FDI inflows. Almost 19.69% change in FDI inflows is accounted for with one percent change in labour cost in Brazil. All these determinants (X3, X5, X6, X8 and X9) are significant at 5% level of significance. The model of Brazil also consists of lag determinants of all the dependent and independent determinants so as to remove the problem of serial correlation from the model. Out of all the lagged determinants, LagX5 (one year past

values of trade openness significant at 5% level of significance) and LagX7 (one year past values of gross capital formation significant at 10% level of significance) also impact the FDI inflows negatively (-113.19%) and positively (1.03%) respectively.

A simple OLS model is run in the case of Brazil because OLS model with robust standard errors was not providing better estimates, i.e. a low R-squared and a non-significant F-statistic. Therefore, results of simple OLS model are discussed here. The R-squared of the model explains the overall explanatory power of the model which is 77.50% with an adjusted R-squared of 46.35%. Durbin- Watson statistic is 2.24 which is within the desired range of 1.5-2.5, thus the model does not suffer from the problem of auto correlation. The F-statistic of the model is 2.49 which is significant at 5% level of significance implying that all the independent determinants jointly are significantly influencing the change in FDI inflows in Brazil and is thus a model of best fit.

2. Russia

In case of Russia, only determinants X2 (Industrial Production Index) and X9 (Labour Cost) appear to be the most significant determinants of FDI inflows. Variable X2 though is expected to positively influence the level of FDI inflows in the country is not true in the case of Russia. A negative but significant (at 10% level of significance) coefficient value of variable X2 implies that a one percent increase in IPI levels will lead to a 0.72% decrease in FDI inflows in Russia. This might be because an increase in real production output of manufacturing, mining and utilities sector is just sufficient in contributing only to domestic sustenance and not letting the foreign players getting the advantage of such increase, thereby reducing them to enter into Russian market. On the other hand variable X9 (labour cost) is negatively impacting, as expected, the FDI inflows and is significant at 1% level of significance. This means that one percent increase in labour cost in Russia will lead to 3.48% decrease in the level of FDI inflows coming into the country. It is to be noted here that as such the results of Granger's Causality test of Russia are not confirmed with this OLS model.

An OLS Robust model is run in the case of Russia as the simple OLS model was not providing better estimates in terms of less number of significant regressors. With the help of OLS robust model, two regressors are explaining the variation in FDI inflows with a better R- squared. Durbin- Watson statistic is 2.32 which shows that the model

does not suffer from the problem of auto correlation. The R-squared of this model is 80.01% with an adjusted R-squared of 69.25% implying that the model is able to explain 69.25% variation in FDI inflows in Brazil. The F-statistic is 16.74 and is significant at 1% level of significance which infers that all the independent determinants are able to explain the variations in FDI inflows significantly and also that this is the model of best fit.

3. India

For both India and China, initially the residuals of their models were not normally distributed. This was tested with the help of Shapiro- Wilk test of normality. Therefore, with the help of Boxplot Graph, outliers were identified in the data series and then regression models were run respectively for both the countries (see Appendix I).

In the regression model of India, it can be seen that determinants X1, X6, X7 and X8 are significantly impacting the dependent variable FDI inflows. Variable X1 (GDP growth rates) has a negative sign of coefficient which implies that even when there is a one percent increase in the GDP growth rates in India, FDI inflows tend to become lesser by 1.10%. This finding is statistically significant at 5% level of significance. Theoretically and as per the available literature, increased level of market size and growth prospects leads to more FDI inflows. However, as per the findings in this model, it can be inferred that probably the restrictive FDI policies of the Indian Govt. are a major reason for restraining the foreign players to enter into the Indian market and operate freely. However, it is also to be noted here that this is an average result with respect to past three decades but with the newly elected government, more liberalized trade policies and campaigns like Make in India launched by the government, more and more foreign participants are motivated to invest in India. This is also reflected in the increased levels of FDI inflows in the past three years i.e. since 2014 till date (new government came into power on 26-05-2014). The highest levels of FDI inflows are achieved by India in year 2015 only, i.e. 44.21 billion USD.

Another significant variable impacting the FDI inflows in India is Variable X6, REER, which is significant at 10% level of significance. Negative coefficient of REER signifies that an appreciation of Indian Rupee acts as a deterrent for the foreign investors to invest in India. One percent increase in the value of Indian Rupee will lead to a

12.31% decline in the FDI inflows. This is simply because the foreign investors find it unprofitable to remit their earnings in their home country while the value of host currency has appreciated. Variable X7 (Gross Capital Formation) has a positive (coefficient value of 0.0132) and significant (at 10% level of significance) impact on the FDI inflows coming into India. It implies that a better investment climate in India leads to a 0.01% increase in FDI inflows. An explanation of another significant (at 10% level of significance) regressor (Variable X8, International Liquidity) is noteworthy here. Due to continuous deficits in the Balance of Payment, the Indian economy is running out of its foreign exchange reserves to meet the increasing demand and making import payments. This has led to a negative impact on the mindset of foreign players making investments in India. This is evident from a negative coefficient value of variable X8 (-2.2186). It is also important to highlight here that India stands at the second last position (next is South Africa) in terms of covering its import payments from the foreign exchange reserves among the BRICS countries.

The results of Granger's Causality test conducted above confirm with the results of OLS model partly (i.e. it also indicated that variable X8 causes variable Y). Durbin-Watson statistic (2.52) is little higher than the desirable range of 1.5-2.5 displaying the problem of auto correlation in the model. Therefore, OLS Robust model is run so as to avoid the problems of auto correlation, less number of significant regressors and an insignificant F- statistic, correction of which will make it a model of best fit.

The R-squared of the model is 94.91% and adjusted R- squared is 71.99% which is quite impressive in explaining the variations in FDI inflows. The F-statistic is 110.17 which is significant at 1% level of significance implying that all the independent determinants jointly are able to influence FDI inflows in India making it a model of best fit.

4. China

The OLS Model for China shows that Variable X3 (inflation rates) plays a significant (at 1% level of significance) role in inviting foreign investors to invest in their country via FDI. A one percent change in inflation in China leads to 0.02% increase in FDI inflows. This may happen because the market shows better demand prospects and a higher purchasing power in the hands of maximum part of population leading to greater

producer surplus which acts as an incentive for the foreign investors. As per Granger causality test conducted above, the direction of causality is though opposite, i.e. it is indeed the FDI inflows that lead to increase in inflation rates in Chinese economy. Trade openness (Variable X5) is also found to significant (at 10% level of significance) determinant affecting FDI inflows in China. A one percent change in trade openness ratio leads to 0.93% increase in FDI inflows. In China, Variable X6 (REER) is also significant (at 5% level of significance) factor for inducing FDI inflows. A positive coefficient of REER indicates that a one percent change in REER will lead to a 1.97% increase in FDI inflows because of increase in expectations of future profitability in terms of the home currency. Lastly, variable X8 (international liquidity) is also positively impacting the FDI inflows in the Chinese economy. It is having a positive and significant (at 10% level of significance) coefficient value implying the country has an excellent financial health in terms of very high foreign exchange reserves to meet its import payments and thus signaling the foreign investors to invest in their country. A one percent increase in the import cover ratio of the country leads to 0.45% increase in FDI inflows.

For China, OLS model with robust standard errors is run so as to get more significant independent determinants, to correct the problem of auto correlation (which is reflected in a high Durbin- Watson statistic (3.32) which is beyond the desired range of 1.5-2.5) and to get a significant F- statistic. The R-squared of this model is 76.51% with an adjusted R- squared of 53.03% which means that the model is able to explain almost 53% variations in FDI inflows in China. An F- statistic of 15.52 is also significant at 1% level of significance implying that jointly all the independent determinants are able to affect the dependent variable, FDI inflows and thus making it a model of best fit.

5. South Africa

For South Africa, robust command with OLS model is executed so as to identify some significant determinants impacting FDI inflows (which are not present in case of simple OLS Model) and also to correct the problem of serial correlation. Problem of negative adjusted R- squared and an insignificant F- statistic is corrected by adding lagged values of variable Y up to last three years and lagged value of variable X1 up to last one year. Only lagged values of these two determinants are to be added was decided

after a number of iterations were tested for other alternatives. This process has finally provided a model of best fit.

In case of this country, only the lagged values of dependent variable, Y, FDI inflows of past three lags are found to be significant determinant in affecting FDI inflows. It may be because more foreign investors plan to invest in this country by looking at the past trends of investment and profitable avenues available in the country. As such none of the other nine economic determinants are significantly impacting the FDI inflows in South Africa. It is to be noted that variable X5 (trade openness) is having the highest and positive coefficient value impacting the FDI inflows, however the value is not found to be significant.

The model provides an R- squared value of 60.53% with an obviously very low adjusted R- squared of 28.46% (only three lagged determinants of dependent variable itself found to be significantly impacting the dependent variable). The model is still able to determine a significant (at 5% level of significance) F-statistic of 2.55 implying that all the independent determinants are jointly able to explain the variation in FDI inflows in South Africa, concluding it to be a model of best fit.

(C.) Residual Diagnostics in Multiple Regression Analysis

Along with the Regression Modeling, it is mandatory for the econometric investigation to conduct the residual diagnostic testing for providing a model of best fit. Thus, Breusch-Godfrey Lagrange Multiplier (Breusch, 1978; Godfrey, 1978) test for diagnosing the problem of serial correlation, Breusch and Pagan (1979) test for examining heteroskedasticity and Jarque- Bera (1980) test for verifying the normality of residuals is also conducted and it is proven that the model of all the five countries is of best fit and is not suffering from any of these problems. The results of all these diagnostic tests are presented in Table 5.2 below:

Table 5.2: Results of Residual Diagnostics of the OLS Model (Economic Determinants) in Brazil, Russia, India, China and South Africa individually

S. No.	Test for Residual Diagnostics	Brazil	Russia	India	China	South Africa
1.	**Test for Serial Correlation:** *Null Hypothesis: Residuals are not serially correlated*	Breusch-Godfrey Serial Correlation LM Test: Observed R-squared = 2.06	Breusch-Godfrey Serial Correlation LM Test: Observed R-squared = 0.84	Breusch-Godfrey Serial Correlation LM Test: Observed R-squared = 1.48	Breusch-Godfrey Serial Correlation LM Test: Observed R-squared = 9.40	Breusch-Godfrey Serial Correlation LM Test: Observed R-squared = 5.38
	Result Interpretation	Since corresponding p-value of above statistic is 0.3568 which is more than 0.05, Null Hypothesis can't be rejected and thus it can be concluded that the residuals are not serially correlated in the model.	Since corresponding p-value of above statistic is 0.6564 which is more than 0.05, Null Hypothesis can't be rejected and thus it can be concluded that the residuals are not serially correlated in the model.	Since corresponding p-value of above statistic is 0.4763 which is more than 0.05, Null Hypothesis can't be rejected and thus it can be concluded that the residuals are not serially correlated in the model.	Since corresponding p-value of above statistic is 0.0091which is less than 0.05, Null Hypothesis can be rejected and thus it can be concluded that the residuals are serially correlated in the model. Therefore, OLS Robust Model is run that removes the problem of serial correlation automatically.	Since corresponding p-value of above statistic is 0.0679 which is more than 0.05, Null Hypothesis can't be rejected and thus it can be concluded that the residuals are not serially correlated in the model. Still, OLS Robust Model is run so as to remove the problem of serial correlation automatically and completely.

S. No.	Test for Residual Diagnostics	Brazil	Russia	India	China	South Africa
2.	**Test for heteroskedasticity** *Null Hypothesis: Residuals are not heteroscedastic*	Breusch-Pagan-Godfrey Heteroskedasticity Test: Observed R-squared = 22.08	Breusch-Pagan-Godfrey Heteroskedasticity Test: Observed R-squared = 3.24	Breusch-Pagan-Godfrey Heteroskedasticity Test: Observed R-squared = 11.78	Breusch-Pagan-Godfrey Heteroskedasticity Test: Observed R-squared = 5.79	Breusch-Pagan-Godfrey Heteroskedasticity Test: Observed R-squared = 12.86
	Result Interpretation	Since the corresponding p-value of the above statistic is 0.2285 which is more than 0.05, the Null Hypothesis can't be rejected, i.e. Residuals are not heteroscedastic, i.e. they are homoscedastic.	Since the corresponding p-value of the above statistic is 0.8620 which is more than 0.05, the Null Hypothesis can't be rejected, i.e. Residuals are not heteroscedastic, i.e. they are homoscedastic.	Since the corresponding p-value of the above statistic is 0.2262 which is more than 0.05, the Null Hypothesis can't be rejected, i.e. Residuals are not heteroscedastic, i.e. they are homoscedastic.	Since the corresponding p-value of the above statistic is 0.6710 which is more than 0.05, the Null Hypothesis can't be rejected, i.e. Residuals are not heteroscedastic, i. e. they are homoscedastic.	Since the corresponding p-value of the above statistic is 0.4586 which is more than 0.05, the Null Hypothesis can't be rejected, i.e. Residuals are not heteroscedastic, i. e. they are homoscedastic.
3.	**Test for Normality** *Null Hypothesis: Residuals are not normally distributed.*	Jarque- Bera Test for Normality: Test Statistic= 0.3467	Jarque- Bera Test for Normality: Test Statistic= 0.2485	Jarque- Bera Test for Normality: Test Statistic= 0.0518	Jarque- Bera Test for Normality: Test Statistic= 0.3636	Jarque- Bera Test for Normality: Test Statistic= 0.8696
	Result	Since the corresponding p-	Since the corresponding p-	Since the corresponding p-	Since the corresponding p-	Since the corresponding p-

S. No.	Test for Residual Diagnostics	Brazil	Russia	India	China	South Africa
	Interpretation	value of above statistic is 0.8408 which is more than 0.05, the Null Hypothesis can't be rejected, i.e. Residuals are normally distributed.	value of above statistic is 0.8832 which is more than 0.05, the Null Hypothesis can't be rejected, i.e. Residuals are normally distributed.	value of above statistic is 0.9745 which is more than 0.05, the Null Hypothesis can't be rejected, i.e. Residuals are normally distributed.	value of above statistic is 0.8338 which is more than 0.05, the Null Hypothesis can't be rejected, i.e. Residuals are normally distributed.	value of above statistic is 0.6474 which is more than 0.05, the Null Hypothesis can't be rejected, i.e. Residuals are normally distributed.

From the above analysis of residual diagnostics of the OLS model conducted for each of the five countries, it can be concluded that none of the countries' model suffer from any problem of normality, heteroskedasticity and serial correlation. Even if there was a problem of auto correlation or serial correlation diagnosed (as in the case of China and South Africa), it is corrected with the help of running an OLS model with robust standard errors as mentioned in the explanation for the OLS models above.

5.4.2 MODEL 2: ONLY INSTITUTIONAL DETERMINANTS

(A.) Testing the assumptions of CLRM

Out of the above mentioned six assumptions, second assumption of multicollinearity has already been tested in the previous chapter. Since the institutional determinants used in this multiple regression analysis are nothing but the country risk ratings, thus the assumption of stationarity and normality are not to be checked as the data will lose its identity. Therefore, only post estimation of the model, residual diagnostic testing is done to ensure that the model is of best fit and does not suffer from the problem of serial correlation or heteroskedasticity or non- normality of residuals and is thus appropriate to explain the variations in the dependent variable.

(B.) Results of OLS or OLS Robust Models

Following table represents the results of multiple regression analysis conducted with the help of OLS robust technique. It consists of institutional determinants affecting FDI inflows for the period of 21 years for all the five countries individually.

Table 5.3: Result of OLS Robust Model (Institutional determinants affecting FDI inflows in Brazil, Russia, India, China and South Africa individually)

Countries →	**Brazil**	**Russia**	**India**	**China**	**South Africa**
Independent Determinants	**Coefficients (t-statistics)**	**Coefficients (t-statistics)**	**Coefficients (t-statistics)**	**Coefficients (t-statistics)**	**Coefficients (t-statistics)**
Intercept	-69.5396 (-1.75)	10.25392 (0.87)	34.25541 (2.15)**	-107.2831 (-1.19)	-47.19761 (-3.93)*
X10	Dropped due to multi collinearity	Dropped due to multi collinearity	Dropped due to multi collinearity	Dropped due to multi collinearity	Dropped due to multi collinearity
X11	-5.1340 (-2.46)**	Dropped due to multi collinearity	7.4861 (2.79)**	11.6348 (1.62)	Dropped due to multi collinearity
X12	Dropped due to multi collinearity	4.3203 (1.62)	0.8218 (0.17)	40.6281 (2.36)**	Dropped due to multi collinearity

X13	3.4795 (0.64)	-2.0809 (-1.24)	Dropped due to multi collinearity	0.1370 (0.03)	0.3341 (0.19)
X14	4.3502 (2.88)**	0.2597 (0.67)	-3.2343 (-3.23)*	17.5490 (2.40)**	0.7330 (1.61)
X15	-0.7459 (-0.45)	-0.5789 (-0.84)	-4.2887 (-3.05)*	-18.4384 (-2.09)***	2.4700 (1.84)***
X16	5.5679 (1.62)	0.1554 (0.04)	Dropped due to multi collinearity	-21.6490 (-2.24)***	Dropped due to multi collinearity
X17	Dropped due to multi collinearity	Dropped due to multi collinearity	7.1735 (3.09)*	-23.2129 (-1.54)	4.3014 (1.99)***
X18	Dropped due to multi collinearity	Dropped due to multi collinearity	Dropped due to multi collinearity	Dropped due to multi collinearity	Dropped due to multi collinearity
X19	0.9336 (0.21)	0.9246 (0.63)	-4.4573 (-2.17)**	10.07864 (3.43)*	-1.3377 (-1.31)
R-squared	0.4884	0.4798	0.3765	0.6001	0.3052
Adjusted R-squared	0.1047	0.1677	0.1093	0.2001	0.0736
F-statistic	14.59*	2.72***	2.74***	4.43**	37.10*
Prob.(F-statistic)	0.0006	0.0784	0.0563	0.0250	0.0000
Durbin-Watson statistic	2.46	2.23	2.21	0.50	2.48

Notes: 1. *, ** and *** denote the significance at one, five and ten percent level, respectively. 2. Figures in parentheses are t-statistics

The results of multiple regression models as per Table 5.3 above are explained as under for each of the five countries one after another:

1. Brazil

It can be seen in the above table that variable X11 has negatively influenced the FDI inflows. As per the ICRG methodology issued by the PRS Group from where the data on country risk ratings has been taken; the higher the risk ratings, the lower the risk a particular country has and vice versa. Because of a lower rating on corruption levels during these three decades period of the study, FDI inflows have decreased in Brazil by 5.13% which is statistically significant at 5% level of significance. As per the results, another significant (at 5% level of significance) institutional factor impacting the FDI inflows positively in Brazil is variable X14 (government stability). It has contributed to 4.35% increase in the FDI inflows into the country.

The R-squared of the OLS Robust model is 48.84% with an adjusted R- squared of 10.47% which means that almost 10.47% variation in FDI inflows in Brazil can be explained by these institutional determinants. The Durbin- Watson statistic is also falling within the desired range 1.5- 2.5 solving the problem of autocorrelation. The F-statistic of the model is 15.59 which is statistically significant at 1% level of significance meaning that all these institutional determinants are able to explain the changes in FDI inflows jointly making it a model of best fit.

2. Russia

It can be concluded from the above analysis in table 20 that although none of the independent determinants (X10- X19) are significant in inducing FDI inflows individually in Russia, still a significant F- statistic (2.72 significant at 10% level of significance) shows that all of them jointly are able to explain he variation in FDI inflows. An R-squared of 47.98% with an adjusted R- squared of 16.77% explains that all the ten institutional determinants (though insignificant) able to explain 16.77% variation in FDI inflows.

3. India

A positive and significant intercept of the model explains that even if in case all the independent determinants remain constant or not present in the model, still FDI is ought to flow in India and increase by 34.26% (significant at 5% level of significance). This is a good signal to showcase how a positive environment and strong fundamentals lead to motivate foreign investors to operate freely in a country. An important significant

(at 5% significance level) variable for India is X11 (corruption). On an average, an improvised rating in terms of high risk points (lower corruption levels) has motivated the foreign investors to make fresh investments in India by an increase in FDI inflows by 7.49%. An obvious significant factor (at 1% significance level) which acts as a deterrent to the FDI inflows coming to India is variable X14 (government stability). A common scenario in India is the conflict from the opposition which disrupts the operations of the present government (like frequent changes in policies) creating an unstable environment for not just the domestic companies but also for the foreign counterparts. This has led to fall in FDI inflows by 3.23%.

Another worldwide known significant (at 1% significance level) factor affecting the internal environment of the Indian economy is variable X15 (internal conflict) which includes terrorism within the country that acts as a major hurdle for the foreign investors to stay invested in India. This reason has resulted in decline of FDI inflows by 4.29%. Variable X17 (military in politics) also shows a significantly positive (coefficient value of 7.1735 significant at 1% level of significance) influence on FDI inflows. India has a least risk of control of military over the system and therefore it acts as a positive signal for the MNCs to put their money into India. On the contrary variable X19 (socio economic conditions) is worsening the situation of FDI inflows flowing to the country (low risk points indicating higher risk). It is because of the poor performance of the country in the past three decades in terms of poverty alleviation, employment generation, equality of income etc. which negatively affects not just the confidence of consumers but also the domestic as well as foreign producers. This factor has a negative coefficient value of -4.4573 meaning thereby a decline of FDI inflows by 4.46%.

The R-squared of the model is 37.65% with an adjusted R- squared value of 10.93% which explains the percentage of variation in dependent variable that is determined by this model. Durbin- Watson statistic of 2.21 infers that it is within the range of 1.5-2.5 and thus the model does not have problem of auto- correlation. The F-statistic (2.74) of the model is statistically significant at 10% level of significance implying that all the independent determinants are able to explain the variation in FDI inflows jointly making it a model of best fit.

4. China

The first and foremost significant factor affecting the FDI inflows in China is variable X12 (ethnic tensions) which is significant at 5% level of significance. Because of least inherent tensions (expressed by high ratings) existing in the Chinese economy in terms of racial discrimination, nationality or language differences, FDI inflows have increased by 40.63%. Another significant determinant (at 5% significance level) for higher FDI inflows in China is variable X14 (government stability). Although there is stability with the one-party system that leads to higher ratings for political stability (evident from an increase in FDI inflows by 17.55%), still there is also very little transparency in rules and other aspects of doing business, which make it challenging for foreign investors. Variable X15 (internal conflict) is another significant (at 10% significance level) variable negatively influencing the FDI inflows coming to China. A lower rating of China on this parameter indicates a greater risk of civil disorder or high risk of terrorism within the country which has led to a decline in FDI by 18.44%. The ratings of China have also reduced on account of improper law and order mechanism in terms of partial judicial system or rising crime rate within the country leading to a decline in FDI inflows by 21.65% (significant at 10% significance level). On the contrary, the Chinese economy is the one the fastest growing economies of the world which is eradicating its root level problems within the economy, like poverty, unemployment, inequality of income, etc., boosting the ratings of socio- economic conditions existing in the country. That is the reason for a positive and significant (at 1% significance level) impact of variable X19 (socio- economic conditions) on the FDI inflows (increased by 10.08%).

The R- squared of the model is 60.01% with an adjusted R- squared of 20.01% implying that almost 20% of the variation in FDI inflows can be explained by this model. The Durbin- Watson statistic, however, is quite low than the desired range of 1.5- 2.5, thus indicating a possibility of auto correlation. Therefore, OLS model with robust standard errors is used in the study to solve this problem. It provides an F- statistic of 4.43 which is statistically significant at 5% significance level making it a model of best fit.

5. South Africa

Though the intercept of the model is significant in influencing the FDI inflows coming to South Africa, however unlike India, it impacts the dependent variable negatively (coefficient value of -47.20 significant at 1% level of significance). This precisely means that if all the institutional determinants are to be held as constant, then there would have been more of outflows of FDI rather than making more investments in South Africa. It may be because of the overall perception in the minds of foreign investors who presume it to be still in the nascent stage of growth and has not much to offer to the foreign investors in terms of skills, infrastructure etc. But, this is to be noted here that merely perception doesn't work in real world scenario and there are practically various factors which are contributing towards the FDI inflows growing in South Africa as shown by the model under this study. There are two such factors (both of them significant at 10% level of significance) identified by the OLS Model with robust standard errors in this case. One of them is variable X15 (internal conflict) which is positively contributing to FDI inflows coming into the country (an increase of FDI inflows by 2.47% is clearly indicated due to this reason). Higher ratings on this account indicate a better position of the country in terms of lower risks of civil disorder or terrorism within the country, motivating the foreign players to make fresh investments. Another crucial determinant of FDI inflows proven by this model is X17 (military in politics) having a positive coefficient value of 4.30. This means that there is least risk of any military takeover in South Africa (displayed by higher ratings getting improvised over the past two decades) which has led to an increase of FDI inflows by 4.30%.

The R- squared of the model is 30.52% with an adjusted R-squared of 7.36% which explain the overall variations in FDI inflows up to this level in South Africa. The Durbin- Watson statistic is 2.48 falling within the desired range of 1.5- 2.5 solving the problem of autocorrelation. The F-statistic is 37.10 statistically significant at 1% significance level explaining that all the independent determinants are jointly impacting the FDI inflows significantly making it a model of best fit.

(C.) Residual Diagnostics in Multiple Regression Analysis

Along with the Regression Modeling, it is mandatory for the econometric investigation to conduct the residual diagnostic testing for providing a model of best fit. Thus, Breusch-Godfrey Lagrange Multiplier (Breusch, 1978; Godfrey, 1978) test for diagnosing the problem of serial correlation, Breusch and Pagan (1979) test for examining heteroskedasticity and Jarque Bera test for verifying the normality of residuals is also conducted and it is proven that the model of all the five countries is of best fit and is not suffering from any of these problems. The results of all these diagnostic tests are presented in Table 5.4 below:

Table 5.4: Results of Residual Diagnostics of the OLS Model (Institutional Determinants) in Brazil, Russia, India, China and South Africa individually

S. No.	Test for Residual Diagnostics	Brazil	Russia	India	China	South Africa
1.	**Test for Serial Correlation:** *Null Hypothesis: Residuals are not serially correlated*	Breusch-Godfrey Serial Correlation LM Test: Observed R-squared = 10.79	Breusch-Godfrey Serial Correlation LM Test: Observed R-squared = 3.90	Breusch-Godfrey Serial Correlation LM Test: Observed R-squared = 1.94	Breusch-Godfrey Serial Correlation LM Test: Observed R-squared = 1.78	Breusch-Godfrey Serial Correlation LM Test: Observed R-squared = 3.33
	Result Interpretation	Since corresponding p-value of above statistic is 0.0045 which is less than 0.05, Null Hypothesis is accepted and thus it can be concluded that the residuals are serially	Since corresponding p-value of above statistic is 0.1420 which is more than 0.05, Null Hypothesis can't be rejected and thus it can be concluded that the	Since corresponding p-value of above statistic is 0.3790 which is more than 0.05, Null Hypothesis can't be rejected and thus it can be concluded that the	Since corresponding p-value of above statistic is 0.4111 which is more than 0.05, Null Hypothesis can't be rejected and thus it can be concluded that the	Since corresponding p-value of above statistic is 0.1895 which is more than 0.05, Null Hypothesis can't be rejected and thus it can be concluded that the residuals

S. No.	Test for Residual Diagnostics	Brazil	Russia	India	China	South Africa
		correlated in the model. Therefore, OLS Robust Model is run that removes the problem of serial correlation automatically.	residuals are not serially correlated in the model.	residuals are not serially correlated in the model.	residuals are not serially correlated in the model.	are not serially correlated in the model.
2.	**Test for heteroskedasticity** *Null Hypothesis: Residuals are not heteroscedastic*	Breusch-Pagan-Godfrey Heteroskedasticity Test: Observed R-squared = 5.88	Breusch-Pagan-Godfrey Heteroskedasticity Test: Observed R-squared = 9.54	Breusch-Pagan-Godfrey Heteroskedasticity Test: Observed R-squared = 3.25	Breusch-Pagan-Godfrey Heteroskedasticity Test: Observed R-squared = 5.11	Breusch-Pagan-Godfrey Heteroskedasticity Test: Observed R-squared = 5.54
	Result Interpretation	Since the corresponding p-value of the above statistic is 0.4366 which is more than 0.05, the Null Hypothesis can't be rejected, i.e. Residuals are not heteroscedastic, i.e. they are homoscedastic.	Since the corresponding p-value of the above statistic is 0.1452 which is more than 0.05, the Null Hypothesis can't be rejected, i.e. Residuals are not heteroscedastic, i.e. they are homoscedastic.	Since the corresponding p-value of the above statistic is 0.7764 which is more than 0.05, the Null Hypothesis can't be rejected, i.e. Residuals are not heteroscedastic, i.e. they are homoscedastic.	Since the corresponding p-value of the above statistic is 0.7463 which is more than 0.05, the Null Hypothesis can't be rejected, i.e. Residuals are not heteroscedastic, i. e. they are homoscedastic.	Since the corresponding p-value of the above statistic is 0.3541 which is more than 0.05, the Null Hypothesis can't be rejected, i.e. Residuals are not heteroscedastic, i. e. they are homoscedastic.
3.	**Test for Normality**	Jarque- Bera Test for Normality:	Jarque- Bera Test for Normality:	Jarque- Bera Test for Normality:	Jarque- Bera Test for Normality:	Jarque- Bera Test for Normality:

S. No.	Test for Residual Diagnostics	Brazil	Russia	India	China	South Africa
	Null Hypothesis: Residuals are not normally distributed.	Test Statistic= 4.58	Test Statistic= 0.33	Test Statistic= 9.42	Test Statistic= 5.61	Test Statistic= 0.3131
	Result Interpretation	Since the corresponding p-value of above statistic is 0.10 which is more than 0.05, the Null Hypothesis can't be rejected, i.e. Residuals are normally distributed.	Since the corresponding p-value of above statistic is 0.8482 which is more than 0.05, the Null Hypothesis can't be rejected, i.e. Residuals are normally distributed.	Since the corresponding p-value of above statistic is 0.0090 which is less than 0.05, the Null Hypothesis can be rejected, i.e. Residuals are not normally distributed. However, the data on ratings can't be normalized as it will lose its identity otherwise.	Since the corresponding p-value of above statistic is 0.0604 which is more than 0.05, the Null Hypothesis can't be rejected, i.e. Residuals are normally distributed.	Since the corresponding p-value of above statistic is 0.8551 which is more than 0.05, the Null Hypothesis can't be rejected, i.e. Residuals are normally distributed.

From the above analysis of residual diagnostics of the OLS model with robust standard errors conducted on institutional determinants for each of the five countries, it can be concluded that none of the countries' model suffer from any problem of heteroskedasticity and serial correlation.

5.5 Summary of results derived for Objective 2 (Model 1- Table 5.1 and Model 2- Table 5.3 discussed above in this chapter):

Table 5.5: Summary of results derived for Objective 2

	Model 1: Economic Determinants Only (Significant determinants at 1%, 5% or 10%)	**Model 2: Institutional Determinants Only (Significant determinants at 1%, 5% or 10%)**
Brazil	X5, X6, X8, LAGX7, -X3, -X9, -LAGX5	X14, -X11
Inference	Trade openness, REER, international liquidity and one year past value of gross capital formation positively affect whereas inflation, labour cost and one year past value of trade openness negatively affect whereas FDI inflows.	Government stability positively affects whereas higher corruption level negatively affects FDI inflows.
Russia	-X2, -X9	NONE
Inference	IPI and labour cost negatively affect FDI inflows.	None of the institutional variables affects FDI inflows in Russia.
India	X7, -X1, -X6, -X8	INTERCEPT, X11, X17, -X14, -X15, -X19
Inference	Gross Capital Formation positively affects whereas GDP growth rates, REER and international liquidity negatively affect FDI inflows.	Positive intercept, lower corruption level and lower involvement of military in politics positively affect whereas lower government stability, higher internal conflicts and poor socio- economic conditions negatively affect FDI inflows.
China	X3, X5, X6, X8	X12, X14, X19, -X15, -X16

	Model 1: Economic Determinants Only (Significant determinants at 1%, 5% or 10%)	**Model 2: Institutional Determinants Only (Significant determinants at 1%, 5% or 10%)**
Inference	Inflation, trade openness, REER and international liquidity positively affect FDI inflows.	Lower ethnic tensions, higher government stability and good socio- economic conditions positively affect whereas internal conflict and improper law and order mechanism negatively affect FDI inflows.
South Africa	-LAGY, -LAGY1, -LAGY2	X15, X17, -INTERCEPT
Inference	The past three years values of FDI inflows itself negatively affect the FDI inflows.	Lower internal conflicts and lower involvement of military in politics positively affect whereas the intercept of the model negatively affects the FDI inflows.

5.6 Conclusion

Thus, it can be concluded that each country is unique in its own way and thus has varied determinants impacting its FDI inflows. As proven above in this chapter, both the models (economic and institutional determinants) are models of best fit and doing justification in explaining the variations in FDI inflows in Brazil, Russia, India, China and South Africa individually. Although there are differences in the factors impacting the FDI inflows coming into these nations individually, it will be equally interesting to examine whether these countries share some commonalities too. With this objective, the next chapter of the study further ponders upon the common determinants of FDI inflows into these nations as a group.

CHAPTER-6
(ANALYSIS: III)

CHAPTER: 6- DETERMINANTS OF FDI INFLOWS IN BRICS NATIONS AS A GROUP

6.1 Introduction

The previous chapter of the study focused on the determination of most significant economic and institutional determinants impacting FDI inflows in each of the five BRICS countries individually. However, persistent economic activities coupled with a growth-oriented strategy since the 1990s have resulted in significant infrastructural and other favorable changes in all the BRICS countries. These changes have transformed BRICS countries into attractive destinations for FDI. With this background, this chapter attempts to estimate the most significant determinants influencing the increased FDI inflows in these countries as a group.

Panel Data regression analysis is employed to meet this objective of the study. Under this technique, all the three regression models i.e. Common Constant (Ordinary Least Square), Fixed Effects and Random Effects are tested to explore the determinants of FDI in BRICS countries over thirty one years' period, i.e. 1983-2013 (except for Russia whose data is available from 1995-2013 for the selected determinants in the study).

6.2 Models specification

In order to determine the most significant economic and institutional determinants, following two models are tested:

Model 1:

$$Y_{it} = \alpha + \beta_1 X1_{it} + \beta_2 X2_{it} + \beta_3 X3_{it} + \beta_4 X4_{it} + \beta_5 X5_{it} + \beta_6 X6_{it} + \beta_7 X7_{it} + \beta_8 X8_{it} + \beta_9 X9_{it} + \mu_{it}$$

The above model includes only economic determinants as independent determinants and FDI inflows as dependent variable.

Model 2:

$$Y_{it} = \alpha + \lambda_1 X10_{it} + \lambda_2 X11_{it} + \lambda_3 X12_{it} + \lambda_4 X13_{it} + \lambda_5 X14_{it} + \lambda_6 X15_{it} + \lambda_7 X16_{it} + \lambda_8 X17_{it} + \lambda_9 X18_{it} + \lambda_{10} X19_{it} + \varepsilon_{it}$$

The above model includes only institutional determinants as independent determinants and FDI inflows as dependent variable.

6.3 Empirical Results and Discussions

6.3.1 MODEL 1: ONLY ECONOMIC DETERMINANTS

(i) Summarizing the data and calculating the correlation between dependent and independent economic determinants:

As a part of preliminary investigations, the descriptive statistics and correlation matrix of the selected economic determinants in the study is given in Table 6.1 and 6.2 respectively. The total number of observations for all the selected determinants (both dependent and independent) is 153 for all the five panels with an average time period of 30.6.

Table 6.1: Descriptive statistics of dependent and independent economic determinants in the study

Variable		Mean	Std. Dev.	Min	Max
i	overall	3.08	1.44	1	5
	between		1.58	1	5
	within		0.00	3.08	3.08
t	overall	17.82	9.39	1	33
	between		2.68	17	23
	within		9.15	1.82	33.82
Y	overall	30.65	56.70	-0.45	290.93
	between		32.74	2.39	85.93
	within		47.81	-54.65	235.64
X1	overall	4.99	4.24	-7.82	15.21
	between		3.30	2.25	9.95
	within		2.97	-5.70	12.12
X2	overall	76.27	36.89	4.55	181.03
	between		17.40	47.24	91.57
	within		33.14	13.72	176.58
X3	overall	83.82	357.46	-1.41	2947.73
	between		151.00	5.39	349.36
	within		328.96	-262.34	2682.20

Variable		Mean	Std. Dev.	Min	Max
X4	overall	10.10	7.08	1.80	27.80
	between		7.04	3.24	21.80
	within		2.72	0.84	16.10
X5	overall	0.38	0.16	0.12	0.73
	between		0.14	0.22	0.54
	within		0.10	0.13	0.64
X6	overall	103.31	25.25	49.92	198.30
	between		12.50	86.91	112.68
	within		22.83	65.98	188.93
X7	overall	6.24	13.18	-45.20	75.20
	between		3.83	3.01	11.69
	within		12.71	-42.45	77.95
X8	overall	8.31	5.61	0.84	29.30
	between		3.83	2.84	13.08
	within		4.37	-0.50	24.52
X9	overall	4.44	15.06	-30.47	66.19
	between		11.27	-9.76	21.12
	within		11.46	-16.27	49.51

Note: Own compilation based on results derived from STATA SE 12.0

From the above table, it is observed that out of the total standard deviation, the maximum variation in series Y (FDI inflows), X2 (Industrial Production Index), X3 (inflation), X6 (exchange rate), X7 (gross capital formation) and X8 (international liquidity) is explained from the variations within each country over this time period in terms of country specific economic factors and a very small variation in these series is due to difference between the countries. On the other hand, the variation in series X1 (market size and growth prospects), X4 (unemployment rates), X5 (trade openness) and X9 (labor cost) is explained because of differences between the countries.

It can also be inferred from the above table that during this period, the value of FDI inflows is maximum in China i.e. $290.92 billion in the year 2013. China is again the leader in having maximum GDP growth rate of 15.21% in the year 1985 whereas the

growth rate of Russia went as low as -7.82% in the year 2009 because of the global economic crisis that hit almost the whole world. In terms of the real production output, i.e. IIP, India stands at the top in the year 2015 due to the policy initiatives made by the newly elected government. In terms of inflation, Brazil had a maximum rate of as high as 2947.33% in the year 1990 whereas China was facing deflationary pressures in the year 1999 with a negative inflation rate of 1.41%. South Africa had the maximum unemployment rate among all these five countries, i.e. 27.8% in the year 2002 whereas China gets the advantage of having least unemployment rate of as low as 1.8% in the year 1985 which is much lower than the average unemployment rate of 10% in all the five countries. In terms of liberalized trade regimes, South Africa is at the apex with the maximum trade openness as a percentage of GDP of 0.73 in the year 2008. In the year 1983, the REER (which is inflation adjusted) of Chinese Yuan was the strongest as compared to other currencies in the index whereas the Russian Ruble was the weakest in the year 1999. The annual percentage growth rate of Russia is the maximum among all the five countries, i.e. 75.2% in the year 2000 which is much higher than the overall average (6.24%) of all five countries. In terms of international liquidity, the table shows that China is able to cover its imports for about 29 months out of its foreign reserves in the year 2009 which implies that the financial health of the country was much better than the other countries in spite of the global economic crisis that hit the world in that period. Labor cost which is calculated as net workers' remittances and compensation on an hourly basis is highest in India in the year 2015 i.e. $66.19 which is almost 18 times higher the average cost of all these five countries.

Therefore, from the above analysis it can be implied that China is the leader in attracting FDI inflows because of very high market size and growth prospects, a relatively lesser inflation and unemployment rates, a strong REER of Chinese Yuan vis-à-vis the other currencies and also the ability to cover its import for a fairly long period of time out of its foreign reserves. On the other hand, the other four countries are seemingly laggards because of various reasons. Russia, for instance, has a sluggish growth rate and also a weaker currency as compared to others. Brazil suffers from very high inflationary pressures. South Africa, though has very liberalized trade regime, suffers from the basic economic problem of unemployment. Last but not the least, India, though has started

improving on account of real production output in its major sectors very recently and has also seen a good track record of receiving highest workers' remittances and compensation, still has to go a long way to become at par with China.

The above analysis is very preliminary and needs strong evidences to accept/ reject the conclusions drawn. Therefore, to understand these independent determinants and their impact on the dependent variable more deeply, correlation matrix has been calculated, the analysis of which is as follows. This is followed by an elaborated regression analysis to analyze the magnitude of these relationships.

Pair- wise correlation is also run to detect any significant correlation among the dependent and independent determinants. This is to check the problem of multicollinearity. The thumb rule to analyze the matrix is where ever the values of correlation coefficient is more than 0.8, either of those determinants should be dropped and then a simple regression needs to be run to check its impact on the value of R-square.

Table 6.2: Correlation matrix of dependent and independent economic determinants in the study

	Y	X1	X2	X3	X4	X5	X6	X7	X8	X9
Y	1.000									
X1	0.278	1.000								
X2	0.316	-0.194	1.000							
X3	-0.114	-0.169	-0.071	1.000						
X4	-0.357	-0.425	0.229	-0.159	1.000					
X5	0.198	0.001	0.450	-0.259	0.361	1.000				
X6	0.157	0.104	-0.041	-0.120	0.045	-0.169	1.000			
X7	0.076	0.701	-0.063	-0.097	-0.167	0.004	0.041	1.000		
X8	0.762	0.325	0.179	-0.087	-0.550	0.066	0.085	0.141	1.000	
X9	0.168	0.258	0.540	-0.053	-0.162	0.054	0.048	0.088	0.039	1.000

Note: Own compilation based on results derived from STATA SE 12.0

Other important information that can be gathered from Table 2 reveals that almost all the determinants of FDI inflows in the model have turned out to be in the expected direction except for labor cost. These signs of determinants have been expected as per the

available theories in literature which is reviewed in Chapter-2 earlier. Only X3 (Inflation Rates) and X4 (Unemployment Rates) are showing a negative sign meaning thereby an inverse relationship with the dependent variable, i.e. FDI inflows are adversely affected by the upward movement in these two determinants. Other than these two determinants, X1 (GDP growth rates), X2 (Industrial Production Index), X5 (Trade Openness), X6 (Exchange Rates), X7 (Gross Capital Formation) and X8 (International Liquidity) are positively correlated with the FDI inflows as expected. X9 (Labor Cost) is showing an opposite sign of correlation with FDI inflows which is to be investigated further in the study with the help of regression analysis. Further, the results in Table 2 display that none of the independent determinants are found to be correlated with each other (values of correlation coefficients is lesser than 0.8), hence, solving the multicollinearity problem in the model.

(ii) Checking the stationarity of all the dependent and independent determinants in the study:

Once the preliminary investigations are done, as a first step to the regression analysis, to test the stationarity of all the series, the Fisher Type Panel Unit Root Test along with the Augmented Dickey Fuller (ADF) settings is chosen as it estimates the results well on the unbalanced panels. The overall panel here is unbalanced because for the five countries, i.e. 'i= 5', the time period for the selected determinants under study is not uniform, i.e. for Brazil, India, China and South Africa, 't' is from 1983- 2015 (33 years), however, for Russia the data is available only from 1995- 2015 (21 years).

Following hypothesis is tested under the Fisher Panel Unit Root Test for all the series of independent determinants and dependent variable:

Null Hypothesis: H_o: All panels contain unit roots

Alternate Hypothesis: H_a: At least one panel is stationary

The results derived from the Fisher Panel Unit Root Test with the help of STATA software are presented as follows:

Table 6.3: Panel Unit Root Test applying Fisher Unit-root test on Unbalanced Panel of Economic Determinants (Original Series)

Variable	Inverse chi-squared(10) P	Inverse normal Z	Inverse logit t(29) L*	Modified inv. chi-squared Pm	Null Hypothesis (Accepted/ Rejected)	Inference about the data series for all five panels (stationary/ non-stationary)
Y Statistic	4.9437	1.8848	1.9665	-1.1306	Accepted	Non- stationary
p-value	0.8949	0.9703	0.9706	0.8709		
X1 Statistic	42.0258	-4.6397	-5.2217	7.1612	Rejected	Stationary
p-value	0.0000	0.0000	0.0000	0.0000		
X2 Statistic	2.2213	2.7167	2.8403	-1.7394	Accepted	Non- stationary
p-value	0.9943	0.9967	0.9959	0.9590		
X3 Statistic	29.6339	-3.3458	-3.5112	4.3903	Rejected	Stationary
p-value	0.0010	0.0004	0.0007	0.0000		
X4 Statistic	7.1403	0.2676	0.2498	-0.6394	Accepted	Non- stationary
p-value	0.7121	0.6055	0.5977	0.7387		
X5 Statistic	8.3063	0.1198	0.1040	-0.3787	Accepted	Non- stationary
p-value	0.5989	0.5477	0.5411	0.6476		
X6 Statistic	22.6696**	-2.5894	-2.5730	2.8330	Rejected	Stationary
p-value	0.0120	0.0048	0.0077	0.0023		
X7 Statistic	55.9897	-5.9519	-7.0217	10.2836	Rejected	Stationary
p-value	0.0000	0.0000	0.0000	0.0000		
X8 Statistic	4.6174	1.3478	1.3251	-1.2036	Accepted	Non- stationary

Variable	Inverse chi-squared(10) P	Inverse normal Z	Inverse logit t(29) L*	Modified inv. chi-squared Pm	Null Hypothesis (Accepted/ Rejected)	Inference about the data series for all five panels (stationary/ non-stationary)
p-value	0.9152	0.9111	0.9023	0.8856		
X9 Statistic	4.7286	2.4665	2.9892	-1.1787	Accepted	Non- stationary
p-value	0.9086	0.9932	0.9972	0.8807		

* and ** denote the significance at the 1% and 5% levels, respectively. The above table is own compilation based on computations done on STATA (Version 12.0).

It can be seen from table 3 above that series X1, X3, X6 and X7 are stationary at one per cent significance level whereas series X2, X4, X5, X8 and X9 are not stationary. Therefore, to avoid the problem of spurious results and to get the most proximate estimates, some of the series of chosen economic determinants are converted into growth series by taking either log differences or first differences (because of both positive and negative values in the series) and some other are taken in their original form (because they are annual percentage growth rates). Series Y, X3 and X9 are converted into first differencing series. Series X1 and X7 are used in their original form as they are annual percentage growth rates. Series X2, X4, X5, X6 and X8 are converted into log differences series.

Once the conversion of the original series into growth series happens, Fisher Type Panel Unit Root Test along with the Augmented Dickey Fuller (ADF) settings is applied again to check the stationarity of the data, the results of which are shown in Table 4 below. The above process is repeated to ensure that the regression model is of best fit and does not provide spurious results:

Table 6.4: Panel Unit Root Test applying Fisher Unit-root test on Unbalanced Panel of Economic Determinants (Growth Series)

Variable	Inverse chi-squared (10) P	Inverse normal Z	Inverse logit t(29) L*	Modified inv. chi-squared Pm	Null Hypothesis (Accepted/ Rejected)	Inference about the data series for all five panels (stationary/ non-stationary)
Y Statistic	88.0116*	-7.5510*	-11.0156	17.4439	Rejected	Stationary
p-value	0.0000	0.0000	0.0000	0.0000		
X1 Statistic	42.0258	-4.6397	-5.2217	7.1612	Rejected	Stationary
p-value	0.0000	0.0000	0.0000	0.0000		
X2 Statistic	49.9965	-5.4296	-6.2598	8.9435	Rejected	Stationary
p-value	0.0000	0.0000	0.0000	0.0000		
X3 Statistic	164.2137	-11.7270	-20.6159	34.4832	Rejected	Stationary
p-value	0.0000	0.0000	0.0000	0.0000		
X4 Statistic	60.8840	-5.8082	-7.5911	11.3780	Rejected	Stationary
p-value	0.0000	0.0000	0.0000	0.0000		
X5 Statistic	54.2918	-5.6681	-6.7768	9.9039	Rejected	Stationary
p-value	0.0000	0.0000	0.0000	0.0000		
X6 Statistic	65.9126	-6.1234	-8.1671	12.5024	Rejected	Stationary
p-value	0.0000	0.0000	0.0000	0.0000		
X7 Statistic	55.9897	-5.9519	-7.0217	10.2836	Rejected	Stationary
p-value	0.0000	0.0000	0.0000	0.0000		
X8 Statistic	97.6744	-8.1735	-12.2538	19.6046	Rejected	Stationary
p-value	0.0000	0.0000	0.0000	0.0000		

Variable	Inverse chi-squared (10) P	Inverse normal Z	Inverse logit t(29) L*	Modified inv. chi-squared Pm	Null Hypothesis (Accepted/ Rejected)	Inference about the data series for all five panels (stationary/ non-stationary)
X9 Statistic	53.5264	-5.5490	-6.6897	9.7328	Rejected	Stationary
p-value	0.0000	0.0000	0.0000	0.0000		

* denotes the significance at the 1% level. The above table is own compilation based on computations done on STATA (Version 12.0).

(iii) Regression Analysis:

After testing the stationarity, in order to capture the distribution of FDI across the BRICS countries over thirty three years period (except for Russia, i.e. 21 years), the estimates of following equation are generated with the following panel data regression models: (1) Pooled Ordinary Least Square (OLS) Regression Model (2) Fixed Effects (FE) Model and (3) Random Effects (RE) Model.

$$Y_{it} = \alpha + \beta_1 X1_{it} + \beta_2 X2_{it} + \beta_3 X3_{it} + \beta_4 X4_{it} + \beta_5 X5_{it} + \beta_6 X6_{it} + \beta_7 X7_{it} + \beta_8 X8_{it} + \beta_9 X9_{it} + \mu_{it} \ldots\ldots\ldots (1)$$

I. Results of Pooled OLS Regression Model

Table 6.5: Pooled OLS Regression Model on Economic Determinants

Dependent Variable: FDI inflows	
Independent Determinants	**Coefficients with their t-statistics**
Intercept	-3.1231 (-1.49)
X1	1.2934 (1.98)**
X2	-9.7144 (-0.21)
X3	-0.0033 (-0.84)
X4	-8.2857

Dependent Variable: FDI inflows	
Independent Determinants	**Coefficients with their t-statistics**
	(-0.71)
X5	56.3599 (3.49)*
X6	49.4247 (3.51)*
X7	-0.1670 (-1.19)
X8	1.0967 (0.26)
X9	-0.6189 (-1.34)
F- Test	{3.84}*
R- squared	0.1948

*, ** and *** denote the significance at 1%, 5% and 10% significance levels respectively. Figures in parenthesis () represent the t- statistic. The above table is own compilation based on computations done on STATA (Version 12.0).

From the above analysis, it is clear that all the determinants have same signs of coefficients as were expected. Variable X1 (market size and growth prospects) is statistically significant at 5 per cent significance level whereas Variable X5 (trade openness) and X6 (exchange rate) are significant at one per cent significance level. The F- statistic of the above model is also significant at one per cent significance level meaning that all the determinants are jointly able to influence the dependent variable i.e. FDI inflows. The R- square of the model is though quite low which means that these determinants are able to explain only 19.48% variation in FDI inflows, however, in panel data even this is well enough to explain the variations.

Once the Pooled OLS regression model is run, regression diagnostics needs to be conducted to check the problems of multicollinearity and heteroskedasticity and then arriving at the model of best fit by removing these problems if they exist.

(a) Checking the problem of multicollinearity:

Immediately after running the above regression model, Variance Inflation Factor (VIF) is estimated to check the problem of multicollinearity. The literature points out that there is indication of multicolinearity if the VIF of individual determinants is greater than 5 (Judge *et al.,* 1982) or the mean VIF is greater than 10. The VIF of Variable X1 and Variable X2 are 5.60 and 5.49 respectively, indicating that these determinants are suffering from the problem of multicollinearity. The mean VIF, however, is 2.40 which is much lesser than 10, thus solving the problem of multicollinearity in the overall model.

Correcting the multicollinearity problem:

Since the VIF value of X1 and X2 is more than 5, it can be inferred that they are collinear with each other and thus a regression model should be run by dropping each of them one by one and then again calculating the value of VIF. Following results are derived after the two determinants X1 and X2 are dropped one by one:

Table 6.6: Pooled OLS Regression Model on Economic Determinants for correcting the problem of multicollinearity

Independent Determinants	**Alternative I (Drop Variable X1)**	**Alternative II (Drop Variable X2)**
	Coefficients with their t-statistics	
Intercept	-0.3724 (-0.23)	-2.9863 (-1.50)
X2 (for alternative I)/ X1 (for alternative II)	62.9466 (2.18)**	1.1857 (2.97)*
X3	-0.0033 (-0.84)	-0.0033 (-0.86)
X4	-9.2408 (-0.78)	-8.1567 (-0.70)
X5	51.4218 (3.19)*	55.5990 (3.54)*
X6	47.5972 (3.35)*	49.3671 (3.51)*
X7	-0.0890	-0.1709

Independent Determinants	Alternative I (Drop Variable X1)	Alternative II (Drop Variable X2)
	Coefficients with their t-statistics	
	(-0.66)	(-1.24)
X8	1.2507 (0.30)	1.1819 (0.29)
X9	-0.6608 (-1.42)	-0.6333 (-1.39)
R- squared	0.1727	0.1946
F- test	{3.76}*	{4.35}*
VIF of Variable X1	-	2.11
VIF of Variable X2	2.07	-
Mean VIF	1.58	1.59

*, ** and *** denote the significance at 1%, 5% and 10% significance levels respectively. Figures in parenthesis () represent the t- statistic. The above table is own compilation based on computations done on STATA (Version 12.0).

It can be seen from the above table that now none of the VIF values is more than 5, and thus no problem of multicollinearity is seen. In both the alternatives, it can be seen that the F-statistic is significant at 1% significance level. However, the r- square value in alternative I is 17.27% whereas in alternative II it is 19.46%. Therefore, alternative II model can be considered as a better explanatory of the changes in FDI inflows with X1 (market size and growth prospects), X5 (trade openness) and X6 (exchange rate) as the significant determinants at 1% significance level.

(b) Checking the problem of heteroskedasticity:

Since it was proved above that X2 should be dropped to solve the problem of multicollinearity, the linear regression model with Y as dependent variable and X1, X3, X4, X5, X6, X7, X8 and X9 as independent determinants can be used hereafter to check the problem of heteroskedasticity. Breusch-Pagan (B-P)/ Cook-Weisberg test for heteroskedasticity is used with the null hypothesis of constant variance in the model. Based on the p-values of B-P test, i.e. 0.000 with the Chi- square value of 23.45, null

hypothesis can be rejected as the p- value is less than 0.05. Thus, it can be concluded that there is substantial amount of heteroskedasticity in the model.

Correcting the heteroskedasticity problem:

The easiest way to correct the problem of heteroskedasticity is to use the regression command with the robust option. This yields heteroskedastic corrected robust standard errors (especially if the structure of heteroskedasticity is unknown). White Heteroskedasticity-Consistent Standard Errors & Covariance method in STATA is used to run the regression model with robust option which automatically corrects the problem of heteroskeadsticity. Following results are obtained for pooled OLS regression model with the robust option:

Table 6.7: Pooled OLS Regression Model on Economic Determinants with robust option for correcting heteroskedasticity

Dependent Variable: FDI inflows	
Independent Determinants	**Coefficients with their p- values**
Intercept	-2.9864 (-1.81)***
X1	1.1857 (2.87)*
X3	-0.0034 (-2.19)**
X4	-8.1568 (-0.88)
X5	55.5990 (2.80)*
X6	49.3671 (3.43)*
X7	-0.1709 (-1.70)***
X8	1.1819 (0.43)
X9	-0.6333

Dependent Variable: FDI inflows	
Independent Determinants	**Coefficients with their p- values**
	(-1.00)
F- Test	{3.21}*
R- squared	0.1946

*, ** and *** denote the significance at 1%, 5% and 10% significance levels respectively. Figures in parenthesis () represent the t- statistic. The above table is own compilation based on computations done on STATA (Version 12.0).

Based on the above results, it can be seen that determinants X1 (market size and growth prospects), X5 (trade openness) and X6 (exchange rate) are positively impacting the FDI inflows and are statistically significant at 1 per cent significance level. Also, determinants X3 (inflation rates) and X7 (gross capital formation) are negatively impacting the FDI inflows and are statistically significant at 5 per cent and 10 per cent level of significance respectively. The R- square of the above model explains 19.46% variation of the FDI inflows and the F- test tells that all the independent determinants are jointly influencing the variation in the FDI inflows and it is statistically significant at 1% significance level.

II. Results of FE and RE Models:

The estimation results of both the models, i.e. FE and RE are presented in Table 8 below:

Table 6.8: FE and RE regression models on Economic Determinants

Dependent Variable: FDI inflows		
Independent Determinants	**Fixed Effects Model (FE)**	**Random Effects Model (RE)**
Intercept	-5.0733 (-1.69)***	-2.9864 [-1.50]
X1	1.6505 (2.55)**	1.1857 [2.97]*
X3	-0.0036 (-0.91)	-0.0034 [-0.86]
X4	-7.7116	-8.1568

Dependent Variable: FDI inflows		
Independent Determinants	**Fixed Effects Model (FE)**	**Random Effects Model (RE)**
	(-0.62)	[-0.70]
X5	57.6118 (3.62)*	55.5990 [3.54]*
X6	51.3214 (3.59)*	49.3671 [3.51]*
X7	-0.2311 (-1.53)	-0.1709 [-1.24]
X8	1.7642 (0.42)	1.1819 [0.29]
X9	-0.4507 (-0.92)	-0.6333 [-1.39]
F- Test	{3.93}*	-
Wald χ^2	-	(34.79)*
R^2 within	0.1836	0.1803
R^2 between	0.7316	0.7156
R^2 overall	0.1894	0.1946
Hausman Test (p- value)	2.26 (0.9439)	
Breusch-Pagan Lagrange multiplier (LM) Test: Var(u) = 0	-	χ^2= 0.00 Prob> χ^2 = 1.0000

Note: Parentheses ( ) and [ ] show the *t*-value and *z*-statistics, respectively. *, ** and *** denote the significance at the 1%, 5% and 10% levels, respectively. The above table is author's own compilation based on computations done on STATA (Version 12.0).

From the above analysis, it is indicated that the Pooled OLS model is better than FE Model due to F test that all u_i=0: where F(4, 140)= 0.68 which is not statistically significant at 5 per cent level and thus reveals that the null hypothesis (OLS model) can not be rejected. So, Pooled OLS model is preferred to FE model.

The next concern is the choice between FE and RE models. To select appropriate model for the empirical analysis, Hausman specification test is conducted. The Chi-square value as per this test is 2.26 which is not significant at five per cent significance level, suggesting that the Generalized Least Squares (GLS) estimators of the RE model are the preferred ones.

Lastly, when the RE Model is compared with the pooled OLS Model with the help of Breusch-Pagan Lagrange Multiplier (LM) test, it is observed that the Prob > χ^2 is more than 0.05. Therefore, the null hypothesis can not be rejected (that variance across the five countries is zero) suggesting that random effects is not appropriate. In other words, there is no evidence of significant difference across countries and thus a pooled OLS regression can be run.

However, as pointed out earlier, the problem with OLS methodology is that it implies that there are no differences between the estimated cross-sections (BRICS in our case) and it is useful under the hypothesis that the data set is a *priori* homogeneous. Therefore, this case is quite restrictive but it is conducted in the study as it allows checking for the existence of multicollinearity in the model by way of VIF. Therefore, RE model is more preferable instead of pooled OLS model because of two reasons, one that the results of latter observed to be similar with the former and two because the Hausman Specification test also favoured the RE Model in comparison with FE Model. Moreover, the Random effects method has more estimation advantages than the pooled OLS method, since in OLS the data classification seems to be a *priori* homogeneous. The estimation ensures homogeneity by choosing the sample countries (BRICS in this study), which are assumed to be the most emerging economies of the world in terms of their growth and market potentials. Therefore, it is decided to drop the Pooled OLS Model and not discuss its results further in this study.

However, once the above results are arrived at, one needs to analyze the residual diagnostics like the test of heteroskedasticity, the test of cross sectional dependence/ contemporaneous correlation, test of serial correlation and test for time fixed effects of both the models to derive the model of best fit to explain the dependent variable (FDI inflows in this study). If in case any of these assumptions pertaining to residual diagnostics are violated, then corrections are to be made in the aforesaid models by

incorporating these assumptions and a robust model can be arrived at. This will be done to make sure about the robustness of parameter co-efficient in explaining the factors that determine the FDI inflows to the BRICS countries.

(a) Testing for time fixed effects:

After running the FE Model, this is tested to see if time fixed effects are needed when running an FE model. It is a joint test to see the null hypothesis that if the dummies for all years are equal to 0, if they are then no time fixed effects are needed. The value of F (32, 108) is 1.31 and the probability of this F- test is greater than 0.05 (i.e. 0.1530), so the null hypothesis can not be rejected that the coefficients for all years are jointly equal to zero, therefore no time fixed effects are needed in this case.

(b) Testing for cross-sectional dependence/ contemporaneous correlation:

After running the FE Model, this test for checking cross-sectional dependence of residuals is conducted. Cross-sectional dependence is more of an issue in macro panels with long time series (over 20-30 years) than in micro panels. Pasaran CD (cross-sectional dependence) test is used to test whether the residuals are correlated across entities. Cross-sectional dependence can lead to bias in tests results (also called contemporaneous correlation). The null hypothesis is that residuals are not correlated. The value of Pesaran's test of cross sectional independence is equal to -0.564 and its probability is equal to 0.5724. Since the p- value is more than 0.05, we can't reject the null hypothesis, i.e. there is no cross- sectional dependence or residuals across entities are not correlated.

(c) Testing for heteroskedasticity:

After running the FE Model, Modified Wald test for group wise heteroskedasticity is run with the null hypothesis of constant variance across all entities. The value of Chi- square distribution as per this test is 311.01 which is statistically significant at 5% significance level. Thus, the null hypothesis is rejected suggesting the problem of heteroskedasticity in the model.

(d) Testing for serial correlation:

Serial correlation tests are applied to macro panels with long time series (over 20-30 years). It is usually not a problem in micro panels (with very few years). Serial correlation causes the standard errors of the coefficients to be smaller than they actually

are with a higher R-squared. Wooldridge test for autocorrelation in panel data is applied to test the same with the null hypothesis of no first- order autocorrelation. The value of F-statistic as per this test is 0.348 which is not statistically significant at 5% significance level (i.e. p- value= 0.5869) implying that the null hypothesis can not be rejected and the data does not have first-order autocorrelation.

Correcting the problem of heteroskedasticity:

From the above results, it is evident that the FE model is suffering from the problem of heteroskedasticity and as such there is no test available for the RE Models to test the same. Therefore, for both FE and RE Models, the Robust option in STATA (Version 12.0) can be applied along with the regression command so as to produce robust standard error estimates for both the panel models. This would solve the problem of heteroskeadsticity (Daniel Hoechle (2007)).The results as per both modified models are presented in Table 6.9.

Table 6.9: Economic Determinants of FDI inflows as per both the modified FE and RE models (with Robust option)

Dependent Variable: FDI inflows		
Independent Determinants	**FE Model (Robust)**	**RE Model (Robust)**
Intercept	-5.0733 (-2.03)**	-2.9864 [-1.60]
X1	1.6505 (3.52)*	1.1857 [4.28]*
X2	Dropped to remove multicollinearity problem	Dropped to remove multicollinearity problem
X3	-0.0036 (-2.33)**	-0.0034 [-2.47]**
X4	-7.7116 (-0.81)	-8.1568 [-1.03]
X5	57.6118 (3.04)*	55.5990 [2.28]**
X6	51.3214 (3.65)*	49.3671 [2.48]**

Dependent Variable: FDI inflows		
Independent Determinants	**FE Model (Robust)**	**RE Model (Robust)**
X7	-0.2311 (-2.49)**	-0.1709 [-2.43]**
X8	1.7642 (0.64)	1.1819 [1.02]
X9	-0.4507 (-0.64)	-0.6333 [-0.89]
F- Test	{3.47}*	-
R^2 within	-	0.1803
R^2 between	-	0.7156
R^2 overall	0.21	0.1946

Note: Parentheses ( ) and [ ] show the *t*-value and *z*-statistics, respectively. *, ** and *** denote the significance at the 1%, 5% and 10% levels, respectively. The above table is author's own compilation based on computations done on STATA (Version 12.0).

In the above table, both the FE and RE models with the robust option for the selected study period are estimated. The robustness of parameter coefficients is used to explain the relationship between FDI inflows and the selected independent determinants. The FE model was rejected based on Hausman specification test (1978) conducted above. Therefore, only the results of RE model (with robust option) are discussed in this study as this is the model of best fit.

III. Findings

The empirical results of the RE model (with robust option) presented in Table 6.9 reveal that X1 (market size and growth prospects for which GDP growth rates are used as proxy) are statistically significant determinant impacting the FDI inflows at 1% significance level. Coefficient value of X1 (1.185) represents both the within- country and between- country effects, i.e. the average effect of GDP growth rate over FDI inflows when it changes across time and between countries by one unit. It simply means that a larger market size of BRICS countries provides more opportunities for sales and also

profits to foreign firms, and therefore attracts greater FDI inflows (results confirm with Severiano, 2011; Singhania and Gupta, 2011; Dhingra and Sidhu, 2011).

Results show that inflation rates (X3) showing a negative sign of coefficient is significant determinant in influencing FDI inflows in BRICS at 5% level of significance (results confirm with Gupta and Singh, 2014; Singhania and Gupta, 2011; Nonnemberg and Mendonca, 2004). It implies that as the inflation rates increase in these emerging economies, the resultant effect on FDI inflows is negative as the MNCs might not like to enter in such a market where their cost of production would increase. This might cut down their margins and thus acts as a de-motivating factor for them while analyzing the alternative of making long term investment into BRICS countries.

Trade openness (X5) is also acting as a major factor (largest coefficient value of 55.59899 and statistically significant at 5% level of significance) in attracting more FDI inflows into BRICS. In simple words, one per cent change in the trade openness in BRICS lead to 55.60% per cent change in FDI inflows. A positive coefficient of trade openness, as expected, shows that all the BRICS countries are following a liberal trade regime and are thus able to successfully attract increasing FDI inflows (results confirm with Seetanah and Rojid, 2011; Severiano, 2011; Nonnemberg and Mendonca, 2004).

The results also reveal a positive sign of coefficient and a statistically significant value of Real Effective Exchange Rate (coefficient value of 49.367 and p-value lesser than 0.05) implying that there is a direct and very strong relationship between FDI inflows and exchange rate movements in the host country. In other words, one per cent change in the exchange rate leads to 49.36% change in the value of FDI inflows in BRICS countries. It implies that due to appreciation of the host currencies of BRICS, FDI inflows have increased into these countries in expectations of future profitability in terms of the home currency at the time of repatriation of profits (results are in conformity with Severiano, 2011; Maniam and Chatterjee, 1998).

Another important factor which is found to be significant as per the RE model is gross capital formation which is statistically significant at 5% level of significance. However the negative sign of coefficient implies that the ownership changes brought by FDI made by the MNEs in the host country do not affect gross capital formation of BRICS countries and it also means the vice versa i.e. the cut throat competition among

the developing countries do not lead to attracting more FDI inflows in a single country because each country brings newer strategies to compete with each other (see the results derived by Vijayakumar et al., 2010).

Besides, the results also show that other determinants such as unemployment rate and labor cost negatively impact and the level of international liquidity measured in terms of import cover ratio positively influence the FDI inflows in BRICS countries though they are not proven to be statistically significant determinants. Finally, it can be asserted from the findings that all the determinants are behaving in the same direction as expected in other developing countries of the world and are extremely useful in attracting FDI inflows in BRICS.

The between R^2 is "How much of the variance between separate panel units i.e. five countries in the present case does this model account for" which in this case means that only 18% variance between these five countries is jointly explained by all these determinants in this model. The within R^2 is "How much of the variance within the panel units does this model account for", i.e. 71.56% variance within each country in this case is explained with the help of RE Model which is the model of best fit and the R^2 overall is a weighted average of these two, i.e. 19.46% variation in totality between the countries and within each country together is explained by this model.

The findings are well supported by the theories that exist in the international business environment which determines the movement of FDI flows to a specific country.

6.3.2 MODEL 2: ONLY INSTITUTIONAL DETERMINANTS

(i) Summarizing the data and calculating the correlation between dependent and independent institutional determinants:

As a part of preliminary investigations, the descriptive statistics and correlation matrix of the selected determinants in the study is given in Table 6.10 and 6.11 respectively. The total number of observations for all the selected determinants (both dependent and independent) is 105 for all the five panels.

Table 6.10: Descriptive statistics of dependent and independent Institutional Determinants in the study

Variable		Mean	Std. Dev.	Min	Max
Y	overall	43.5454	64.3799	0.5503	290.9284
	between		50.5210	3.7349	130.5289
	within		45.6425	-51.1342	203.945
X10	overall	2.0762	0.6606	1	3
	between		0.6748	1.0952	3
	within		0.2621	1.9333	3.0285
X11	overall	2.4063	0.7410	1	5
	between		0.4465	1.8333	2.9048
	within		0.6241	1.2003	4.5016
X12	overall	3.2926	0.8935	2	5
	between		0.8037	2.2857	4.2725
	within		0.5260	2.4831	4.9117
X13	overall	9.9147	1.2822	5	12
	between		0.8433	9.0598	10.9385
	within		1.0342	5.8549	12.8319
X14	overall	9.1915	1.7623	5	12
	between		1.1623	8.3023	10.7423
	within		1.4193	4.0479	11.8892
X15	overall	9.0420	1.2483	4	11.5
	between		0.8923	7.8787	10.2053
	within		0.9566	4.5146	11.5146
X16	overall	3.4067	0.9927	1.5	5
	between		1.0204	2.1289	4.5714
	within		0.3799	2.335	4.8353
X17	overall	3.9762	0.8503	2	5
	between		0.8374	2.6429	4.9524
	within		0.3957	2.7381	4.9286
X18	overall	4.7762	1.3480	1	6

Variable		Mean	Std. Dev.	Min	Max
	between		1.3917	2.3810	6
	within		0.5027	2.7761	5.7762
X19	overall	5.5015	1.4643	2	9
	between		1.0595	4.6137	7.2354
	within		1.1124	2.2661	7.8878

Note: Own compilation based on results derived from STATA SE 12.0

From the above table, it is observed that out of the total standard deviation, the maximum variation in series X11(corruption), X13 (external conflict), X14 (government stability), X15 (internal conflict) and X19 (socio-economic conditions) is explained from the variations within each country over this time period in terms of country specific institutional factors and a very small variation in these series is due to difference between the countries. On the other hand, the variation in series X10 (bureaucracy quality), X12 (ethnic tensions), X16 (law and order), X17 (military in politics) and X18 (religious tensions) is explained because of differences between the countries. It can also be inferred from the above table that during this period, the value of FDI inflows is maximum in China i.e. $290.92 billion in the year 2013.

To understand these independent determinants and their impact on the dependent variable more deeply, correlation matrix has been calculated, the analysis of which is as follows. This is followed by an elaborated regression analysis to analyze the magnitude of these relationships.

Pair- wise correlation is run to detect any significant correlation among the dependent and independent determinants. This is to check the problem of multicollinearity. The thumb rule to analyze the matrix is where ever the values of correlation coefficient is more than 0.8, either of those determinants should be dropped and then a simple regression needs to be run to check its impact on the value of R-square.

Table 6.11: Correlation matrix of dependent and independent Institutional Determinants in the study

	Y	X10	X11	X12	X13	X14	X15	X16	X17	X18	X19
Y	1.000										
X10	-0.099	1.000									
X11	-0.108	0.495	1.000								
X12	0.278	-0.022	0.200	1.000							
X13	-0.051	0.127	0.271	0.475	1.000						
X14	0.353	-0.472	-0.363	0.105	-0.372	1.000					
X15	0.276	-0.093	0.166	0.540	0.381	0.168	1.000				
X16	0.347	0.099	-0.235	0.077	-0.377	0.370	0.064	1.000			
X17	-0.462	-0.082	0.292	-0.253	0.014	-0.275	-0.245	-0.521	1.000		
X18	0.135	-0.548	0.203	0.506	0.382	0.121	0.452	-0.401	0.081	1.000	
X19	0.685	-0.041	0.141	0.415	0.012	0.305	0.457	0.375	-0.353	0.315	1.000

From the above matrix, it can be seen that FDI inflows in BRICS countries, as a group, is positively correlated to X12 (ethnic tensions), X14 (government stability), X15 (internal conflict), X16 (law and order), X18 (religious tensions) and X19 (socio economic conditions). In other words, it can be said that the ratings on these determinants positively impact the FDI inflows in the BRICS countries. On the other hand, the determinants like X10 (bureaucracy quality), X11 (corruption), X13 (external conflict) and X17 (military in politics) have a negative correlation with FDI inflows. However, to delve deeper into this issue, a detailed regression analysis need to be conducted, the results of which are discussed here under.

(ii) Checking the stationarity of only the dependent variable in this model:

Once the preliminary investigations are done, as a first step to the regression analysis, to test the stationarity of the series, the Levin- Lin- Chu (2002) Panel Unit Root Test along with the Augmented Dickey Fuller (ADF) settings of 1 lag is chosen as it estimates the results well on the balanced panels. The overall panel here is balanced because for the five countries, i.e. 'i= 5', the time period for the selected determinants under study is uniform, i.e. for all five countries,'t' is from 1995- 2015 (21 years). No stationarity needs to be checked for the country risk ratings (the independent

determinants X10- X19) as the data will lose its heterogeneity if it is converted into growth series like the economic determinants. Therefore, the institutional determinants are tested for the regression analysis in their original form and without making any modifications in their trend.

Following hypothesis is tested under the Levin- Lin- Chu Panel Unit Root Test for the FDI inflows, the dependent variable:

Null hypothesis: H_o: Panels contain unit roots

Alternative Hypothesis: H_a: Panels are stationary

The p-value obtained in the test is 0.4700 which is more than 5% significance level, therefore the null hypothesis can not be rejected and it can be inferred that the FDI inflows series is suffering from the unit root problem. To convert the series into stationary form, the log difference is created and again tested for Levin-Lin-Chu panel unit root test. Now, the p-value of the t-statistic under this test becomes 0.0186 which is less than significance level of 0.05. Thus, the null hypothesis can be rejected and it can be concluded that the FDI inflows series is stationary.

(iii) Regression Analysis:

After testing the stationarity, in order to capture the distribution of FDI across the BRICS countries over twenty one year period, the estimates of following equation are generated with the following panel data regression models: (1) Pooled Ordinary Least Square (OLS) Regression Model (2) Fixed Effects (FE) Model and (3) Random Effects (RE) Model.

$$Y_{it} = \alpha + +\beta_{10} X10_{it} + \beta_{11} X11_{it} + \beta_{12} X12_{it} + \beta_{13} X13_{it} + \beta_{14} X14_{it} + \beta_{15} X15_{it} + \beta_{16} X16_{it} + \beta_{17} X17_{it} + \beta_{18} X18_{it} + \beta_{19} X19_{it} + \mu_{it} \ldots\ldots (2)$$

I. Results of Pooled OLS Regression Model

Table 6.12: Pooled OLS Regression Model on Institutional Determinants

Dependent Variable: FDI inflows	
Independent Determinants	**Coefficients with their t-statistics**
Intercept	-3.0660 (-1.98)***
X10	0.1967 (0.77)

Dependent Variable: FDI inflows	
Independent Determinants	**Coefficients with their t-statistics**
X11	0.0384 (0.23)
X12	-0.1399 (-1.16)
X13	0.1609 (2.02)**
X14	0.0632 (1.14)
X15	-0.0089 (-0.12)
X16	0.1291 (1.08)
X17	0.0676 (0.58)
X18	0.0643 (0.48)
X19	0.0065 (0.10)
F- Test	{3.84}*
R- squared	0.1948

*, ** and *** denote the significance at 1%, 5% and 10% significance levels respectively. Figures in parenthesis () represent the t- statistic. The above table is own compilation based on computations done on STATA (Version 12.0).

From the above analysis, it can be seen that only the intercept and variable X13 (external conflict) is statistically significant at 10 percent and 5 per cent significance level respectively. The F- statistic of the above model is also not significant that all the institutional determinants are jointly also not able to influence the dependent variable i.e. FDI inflows. The R- square of the model is also quite low which means that these determinants are able to explain only 7.32% variation in FDI inflows, however, in panel data even this is well enough to explain the variations.

Once the Pooled OLS regression model is run, regression diagnostics needs to be conducted to check the problems of multicollinearity and heteroskedasticity and then arriving at the model of best fit by removing these problems if they exist.

(a) Checking the problem of multicollinearity:

Immediately after running the above regression model, Variance Inflation Factor (VIF) is estimated to check the problem of multicollinearity. The VIF of Variable X10 and Variable X18 are 5.99 and 6.99 respectively, indicating that these determinants are suffering from the problem of multicollinearity. The mean VIF, however, is 3.17 which is much lesser than 10, thus solving the problem of multicollinearity in the overall model.

Correcting the multicollinearity problem:

Since the VIF value of X10 and X18 is more than 5, it can be inferred that they are collinear with each other and thus a regression model should be run by dropping each of them one by one and then again calculating the value of VIF. Following results are derived after the two determinants X10 and X18 are dropped one by one:

Table 6.13: Pooled OLS Regression Model on Institutional Determinants for correcting the problem of multicollinearity

Independent Determinants	**Alternative I (Drop Variable X18)**	**Alternative II (Drop Variable X10)**
	Coefficients with their t-statistics	
Intercept	-2.689 (-2.03)**	-2.3453 (-1.90)***
X10 (for alternative I)/ X18 (for alternative II)	0.0992 (0.65)	-0.0192 (-0.24)
X11	0.0853 (0.63)	0.1341 (1.18)
X12	-0.1140 (-1.07)	-0.1112 (-0.97)
X13	0.1646 (2.09)**	0.1674 (2.12)**
X14	0.0598 (1.09)	0.0490 (0.94)

Independent Determinants	Alternative I (Drop Variable X18)	Alternative II (Drop Variable X10)
	Coefficients with their t-statistics	
X15	-0.0047 (-0.06)	-0.0080 (-0.11)
X16	.0973 (0.98)	0.1015 (0.89)
X17	0.0517 (0.47)	0.0309 (0.29)
X19	0.0178 (0.29)	0.0173 (0.26)
R- squared	0.0710	0.0674
F- test	0.81	0.76
VIF of Variable X18	-	2.49
VIF of Variable X10	2.13	-
Mean VIF	1.98	2.03

*, ** and *** denote the significance at 1%, 5% and 10% significance levels respectively. Figures in parenthesis () represent the t- statistic. The above table is own compilation based on computations done on STATA (Version 12.0).

It can be seen from the above table that now none of the VIF values is more than 5, and thus no problem of multicollinearity is seen. However, in both the alternatives, it can be seen that the F-statistic is not significant. The r- square value in alternative I is 7.10% whereas in alternative II it is 6.47%. Therefore, alternative I model can be considered as a better explanatory of the changes in FDI inflows with the intercept and X13 (threat of external conflict) as the significant determinants at 5% significance level.

(b) Checking the problem of heteroskedasticity:

Since it was proved above that X18 should be dropped to solve the problem of multicollinearity, the linear regression model with Y as dependent variable and X11, X12, X13, X14, X15, X16, X17 and X19 as independent determinants can be used hereafter to check the problem of heteroskedasticity. Breusch-Pagan (B-P)/ Cook-Weisberg (1983) test for heteroskedasticity is used with the null hypothesis of constant variance in the model. Based on the p-values of B-P test, i.e. 0.1058 with the Chi- square

value of 2.62, null hypothesis can not be rejected as the p- value is more than 0.05. Thus, it can be concluded that there is no heteroskedasticity in the model.

II. Results of FE and RE Models:

The estimation results of both the models, i.e. FE and RE are presented in Table 6.14 below:

Table 6.14: FE and RE regression models on Institutional Determinants

Dependent Variable: FDI inflows		
Independent Determinants	**Fixed Effects Model (FE)**	**Random Effects Model (RE)**
Intercept	-3.9761 (-2.58)**	-2.6889 [-2.03]
X10	0.8348 (1.84)***	0.0992 [0.65]
X11	-0.0646 (-0.40)	0.0853 [0.63]
X12	-0.0173 (-0.10)	-0.1140 [-1.07]
X13	0.1423 (1.77)***	0.1646 [2.09]**
X14	0.1054 (1.77)***	0.0598 [1.09]
X15	0.0315 (0.39)	-0.0047 [-0.06]
X16	-0.1620 (-0.63)	0.0973 [0.98]
X17	0.0285 (0.12)	0.0517 [0.47]
X19	0.0636 (0.73)	0.0178 [0.29]
F- Test	1.26	-
Wald χ^2	-	7.26
R^2 within	0.1111	0.0750

Dependent Variable: FDI inflows		
Independent Determinants	**Fixed Effects Model (FE)**	**Random Effects Model (RE)**
R^2 between	0.1609	0.2440
R^2 overall	0.0294	0.0710
Hausman Test (p- value)	4.44 (0.8800)	
Breusch-Pagan Lagrange multiplier (LM) Test: Var(u) = 0	-	χ^2= 0.00 Prob> χ^2 = 1.0000

Note: Parentheses ( ) and [ ] show the *t*-value and *z*-statistics, respectively. *, ** and *** denote the significance at the 1%, 5% and 10% levels, respectively. The above table is author's own compilation based on computations done on STATA (Version 12.0).

From the above analysis, it is indicated that the Pooled OLS model is better than FE Model due to F test that all u_i=0: where F(4, 91)= 1.11 which is not statistically significant at 5 per cent level and thus reveals that the null hypothesis (OLS model) can not be rejected. So, Pooled OLS model is preferred to FE model.

The next concern is the choice between FE and RE models. To select appropriate model for the empirical analysis, Hausman specification test is conducted. The Chi-square value as per this test is 4.44 which is not significant at five per cent significance level, suggesting that the Generalized Least Squares (GLS) estimators of the RE model are the preferred ones.

Lastly, when the RE Model is compared with the pooled OLS Model with the help of Breusch-Pagan Lagrange Multiplier (LM) test, it is observed that the Prob > χ^2 is more than 0.05. Therefore, the null hypothesis can not be rejected (that variance across the five countries is zero) suggesting that random effects is not appropriate. In other words, there is no evidence of significant difference across countries and thus a pooled OLS regression can be run.

However, as pointed out earlier, the problem with OLS methodology is that it implies that there are no differences between the estimated cross-sections (BRICS in our case) and it is useful under the hypothesis that the data set is a *priori* homogeneous. Therefore, this case is quite restrictive but it is conducted in the study as it allows

checking for the existence of multicollinearity in the model by way of VIF. Therefore, RE model is more preferable instead of pooled OLS model because of two reasons, one that the results of latter observed to be similar with the former and two because the Hausman Specification test also favoured the RE Model in comparison with FE Model. Moreover, the Random effects method has more estimation advantages than the pooled OLS method, since in OLS the data classification seems to be a *priori* homogeneous. The estimation ensures homogeneity by choosing the sample countries (BRICS in this study), which are assumed to be the most emerging economies of the world in terms of their growth and market potentials. Therefore, it is decided to drop the Pooled OLS Model and not discuss its results further in this study.

However, once the above results are arrived at, one needs to analyze the residual diagnostics like the test of heteroskedasticity, the test of cross sectional dependence/ contemporaneous correlation, test of serial correlation and test for time fixed effects of both the models to derive the model of best fit to explain the dependent variable (FDI inflows in this study). If in case any of these assumptions pertaining to residual diagnostics are violated, then corrections are to be made in the aforesaid models by incorporating these assumptions and a robust model can be arrived at. This will be done to make sure about the robustness of parameter co-efficient in explaining the factors that determine the FDI inflows to the BRICS countries.

(i) Testing for time fixed effects:

After running the FE Model, this is tested to see if time fixed effects are needed when running an FE model. It is a joint test to see the null hypothesis that if the dummies for all years are equal to 0, if they are then no time fixed effects are needed. The value of F (20, 71) is 1.23 and the probability of this F- test is greater than 0.05 (i.e. 0.2549), so the null hypothesis can not be rejected that the coefficients for all years are jointly equal to zero, therefore no time fixed effects are needed in this case.

(ii) Testing for cross-sectional dependence/ contemporaneous correlation:

After running the FE Model, this test for checking cross-sectional dependence of residuals is conducted. Cross-sectional dependence is more of an issue in macro panels with long time series (over 20-30 years) than in micro panels. Pasaran CD (cross-sectional dependence) test is used to test whether the residuals are correlated across

entities. Cross-sectional dependence can lead to bias in tests results (also called contemporaneous correlation). The null hypothesis is that residuals are not correlated. The value of Pesaran's test of cross sectional independence is equal to 1.665 and its probability is equal to 0.0959. Since the p- value is more than 0.05, we can't reject the null hypothesis, i.e. there is no cross- sectional dependence or residuals across entities are not correlated.

(iii)Testing for heteroskedasticity:

After running the FE Model, Modified Wald test for group wise heteroskedasticity is run with the null hypothesis of constant variance across all entities. The value of Chi- square distribution as per this test is 672.39 which is statistically significant at 5% significance level. Thus, the null hypothesis is rejected suggesting the problem of heteroskedasticity in the model.

(iv) Testing for serial correlation:

Serial correlation tests are applied to macro panels with long time series (over 20-30 years). It is usually not a problem in micro panels (with very few years). Serial correlation causes the standard errors of the coefficients to be smaller than they actually are with a higher R-squared. Wooldridge test for autocorrelation in panel data is applied to test the same with the null hypothesis of no first- order autocorrelation. The value of F- statistic as per this test is 2.070 which is not statistically significant at 5% significance level (i.e. p- value= 0.2237) implying that the null hypothesis can not be rejected and the data does not have first-order autocorrelation.

Correcting the problem of heteroskedasticity:

From the above results, it is evident that the FE model is suffering from the problem of heteroskedasticity and as such there is no test available for the RE Models to test the same. Therefore, for both FE and RE Models, the Robust option in STATA (Version 12.0) can be applied along with the regression command so as to produce robust standard error estimates for both the panel models. This would solve the problem of heteroskeadsticity (Daniel Hoechle (2007)).The results as per both modified models are presented in Table 6.15.

Table 6.15: Institutional Determinants of FDI inflows as per both the modified FE and RE models (with Robust option)

Dependent Variable: FDI inflows		
Independent Determinants	**FE Model (Robust)**	**RE Model (Robust)**
Intercept	-3.9761 (-3.02)*	-2.6889 [-1.48]
X10	0.8348 (2.74)*	0.0992 [0.73]
X11	-0.06456 (-0.59)	0.08526 [0.72]
X12	-0.01734 (-0.11)	-0.11399 [-1.17]
X13	01423 (2.48)	0.1646 [2.40]**
X14	0.1054 (1.82)	0.0598 [0.90]
X15	0.0315 (0.48)	-0.0047 [-0.11]
X16	-0.1620 (-0.57)	0.0973 [2.40]**
X17	0.0285 (0.19)	0.0517 [0.62]
X18	Dropped due to multicollinearity problem	Dropped due to multicollinearity problem
X19	0.0636 (1.14)	0.0178 [0.43]
F- Test	(1.85)***	-
R^2 within	-	0.0750
R^2 between	-	0.2440
R^2 overall	0.1142	0.0710

Note: Parentheses ( ) and [ ] show the *t*-value and *z*-statistics, respectively. *, ** and *** denote the significance at the 1%, 5% and 10% levels, respectively. The above table is author's own compilation based on computations done on STATA (Version 12.0).

In the above table, both the FE and RE models with the robust option for the selected study period are estimated. The robustness of parameter coefficients is used to explain the relationship between FDI inflows and the selected independent determinants. The FE model was rejected based on Hausman specification test (1978) conducted above. Therefore, only the results of RE model (with robust option) are discussed in this study as this is the model of best fit.

III. Findings

The empirical results of the RE model (with robust option) presented in Table 6.15 reveal that X13 (ratings for the threat of external conflict to a country) and X16 (ratings for the law and order situation in the country) are statistically significant determinants impacting the FDI inflows at 5% significance level. Also, the sign of coefficients of both these determinants is positive, symbolizing that higher the ratings for these two determinants for the country, lesser these countries are prone to such risks which in turn implies better investment environment for the foreign investors in BRICS countries. It can also be inferred from the above analysis of RE model with robust option that all these institutional determinants (except variable X18, i.e. religious tensions) are able to explain almost 24.40% variation in the FDI inflows.

6.4 Summary of results derived for Objective 3 (Model 1- Table 6.9 and Model 2- Table 6.15 discussed above in this chapter)

Table 6.16: Summary of results derived for Objective 3

Model of Best Fit: **RE Model Robust** (Proven by Hausman Specification Test)	**Model 1: Economic Determinants Only**	**Model 2: Institutional Determinants Only**
Significant Determinants	X1, -X3, X5, X6, -X7	X13, X16
Inference	Market size and growth prospects for which GDP growth rates are used as proxy, Trade Openness and	Higher ratings of 'Threat of external conflict' and 'Law and Order Mechanism' indicate that the countries

	REER positively affect whereas Inflation rates and Gross Capital Formation negatively affect FDI inflows in BRICS nations as a group.	are at least risk in these two areas commonly and positive coefficients of these two determinants indicate that they are positively affecting FDI inflows in BRICS nations as a group.
Percentage of Variation explained by the model	R- SQUARED: 0.7156	R- SQUARED: 0.2440
Inference	This model of all the economic (quantitative) determinants together is able to explain 71.56% variation in the FDI inflows in the BRICS countries as a group.	This model of all the institutional (qualitative) determinants together is able to explain 24.40% variation in the FDI inflows in the BRICS countries as a group.

6.5 Conclusion

Both the models tested above proved that all the five countries in the group do share some commonalities in both economic and institutional determinants affecting FDI inflows. Market size and growth prospects, trade openness and REER positively affect whereas inflation rates and gross capital formation negatively affect FDI inflows in BRICS nations as a group. In terms of institutional determinants, least threat of external conflicts and better law and order mechanism positively affecting FDI inflows in BRICS nations as a group. Both the models in this chapter were also tested for residual diagnostics and were proven to be the models of best fit in explaining the variations in FDI inflows in BRICS nations as a group.

After individual country and group wise analysis done in chapter- 4 and 5 respectively, the next obvious questions are: (a) which country in the BRICS stands as a leader and which remains a laggard in attracting FDI inflows and also in terms of economic growth and (b) why should an MNC invest in BRICS? The next chapter in the study is an attempt to address these two issues along with a detailed analysis of the strengths and weaknesses of these respective countries along with their phases of economic development.

CHAPTER- 7
(ANALYSIS: IV)

CHAPTER: 7- TRENDS AND PATTERNS OF MACRO-ECONOMIC ENVIRONMENT AND INSTITUTIONAL QUALITY, CHALLENGES AND PROSPECTS OF BRICS NATIONS

7.1 Introduction

This chapter of the study throws light on the most important issue related to the growing importance of Brazil, Russia, India, China and South Africa (BRICS) in the world forum in terms of attracting FDI inflows. The objective of this chapter is to conduct a comparative analysis of BRICS countries so as to address the question 'why should an MNC make FDI in BRICS countries?' To fulfill this objective, this chapter highlights the various strengths and weaknesses possessed by these nations that should be considered by the foreign investors while choosing these five countries as their investment destination.

The chapter also analyzes the concern of policy makers of these countries (i.e. how these countries can sustain their position as the fastest growing economies of the world) with the help of elaborating the current structure of these most emerging economies of the world, their phases of economic development and also the trends and patterns of FDI inflows coming into each of these five countries. The chapter ends with the discussion on the prospects of BRICS countries as group so as to analyze their prospects of becoming the supreme power in the world.

7.2 Trends and Patterns of FDI inflows and its determinants in BRICS (both country wise and period wise)

The present study has already determined the most significant factors (both economic and institutional) considered by the foreign investors for making FDI in Brazil, Russia, India, China and South Africa individually and also in BRICS nations as a group. Now, it is essential to analyze that as per the data related to these determinants, which nations out of the BRICS have come out as leaders and which are still laggards (see table 7.1). Moreover, the period under study is quite long, covering three decades (two decades, 1995-2015 for Russia), therefore it will be interesting to examine the journey of BRICS in terms of their performance in the context of these determinants considered under this study during this period of time (table 7.2).

Table 7.1: A summary of the economic determinants used in this study to analyze macroeconomic environment of each of the BRICS countries for the period 1983 – 2015 (except for Russia, 1995-2015)

ECONOMIC DETERMINANTS										
Countries	**Statistics**	**Y**	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**	**X7**	**X8**	**X9**
BRAZIL	**Mean**	27.12	2.72	78.20	349.36	6.95	0.22	90.35	3.67	8.40	1.43
	Median	16.59	3.20	73.69	8.45	6.75	0.21	90.81	5.83	8.18	1.57
	Standard Deviation	31.63	3.04	15.16	716.09	2.49	0.05	20.49	11.47	3.72	0.93
	Minimum	0.35	-3.85	52.74	3.20	3.35	0.14	63.59	-23.61	2.20	0.01
	Maximum	101.16	7.99	102.50	2947.73	12.32	0.30	127.81	31.68	16.83	2.97
RUSSIA	**Mean**	24.52	2.86	76.96	26.84	8.13	0.54	86.91	3.49	10.64	-9.76
	Median	15.40	4.50	80.65	13.68	7.70	0.53	87.07	3.94	11.57	-3.39
	Standard Deviation	24.74	5.09	19.32	43.07	2.43	0.07	20.65	25.37	6.31	10.48
	Minimum	2.07	-7.82	47.96	5.08	5.20	0.47	49.92	-45.20	2.11	-30.47
	Maximum	74.78	10.00	101.48	197.47	13.30	0.69	117.73	75.20	21.04	0.27
INDIA	**Mean**	11.05	6.37	87.65	7.89	9.68	0.30	108.20	8.36	7.41	21.12
	Median	3.58	6.64	71.66	8.35	9.86	0.24	96.89	8.03	7.05	11.09
	Standard Deviation	14.70	2.13	52.06	3.03	2.81	0.15	27.78	9.51	2.29	22.49
	Minimum	0.01	1.06	25.10	3.26	5.53	0.12	79.78	-9.98	2.49	2.20
	Maximum	44.21	10.26	181.03	13.87	13.54	0.56	179.61	31.74	13.09	66.19

ECONOMIC DETERMINANTS											
Countries	**Statistics**	**Y**	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**	**X7**	**X8**	**X9**
CHINA	**Mean**	85.93	9.95	47.24	5.39	3.24	0.39	112.68	11.69	13.08	4.76
	Median	43.75	9.62	30.61	3.06	3.10	0.38	107.04	10.98	12.09	1.52
	Standard Deviation	96.19	2.70	43.69	6.35	0.87	0.13	25.67	7.89	6.67	6.97
	Minimum	0.64	3.93	4.55	-1.41	1.80	0.14	75.35	0.15	4.28	0.00
	Maximum	290.93	15.21	147.54	24.24	4.30	0.65	198.30	35.58	29.30	25.76
SOUTH AFRICA	**Mean**	2.39	2.25	91.57	8.91	21.80	0.52	112.46	3.01	2.84	-0.52
	Median	0.82	2.60	89.45	7.35	23.00	0.51	111.31	3.22	2.52	-0.43
	Standard Deviation	3.00	2.18	11.58	4.41	4.07	0.08	18.95	9.01	1.48	0.28
	Minimum	-0.45	-2.14	73.38	1.39	12.54	0.39	75.99	-19.92	0.84	-1.06
	Maximum	9.89	5.59	111.27	18.65	27.80	0.73	172.40	21.70	5.84	-0.15

Table 7.1 above provide an overview of the macroeconomic environment of each of the BRICS countries in terms of economic determinants for three decades long period (except for Russia, 21 years period), which is summarized as follows on an average basis:

- China has attracted the maximum FDI inflows followed by Brazil, Russia, India and South Africa.

- China has been leading in terms of largest market size and growth prospects as well. Its GDP growth rates are the highest among the other four countries which follow its path in this order: India, Russia, Brazil and South Africa.
- South Africa has the highest pace in terms of real production output in manufacturing, mining and utilities sector measured by the Industrial Production Index followed by India, Brazil, Russia and China.
- Brazil has been suffering from high inflation rates for long. Its average is the highest followed by Russia, South Africa, India and China.
- In terms of unemployment rates, South Africa stands at the top followed by India, Russia, Brazil and China.
- Trade openness, a measure of an economy's integration with the world economy, is highest in Russia followed by South Africa, China, India and Brazil.
- Real effective exchange rate is highest for Chinese Yuan followed by South African Rand, Indian Rupee, Brazilian Real and Russian Ruble.
- China has the highest gross capital formation growth rate during this period followed by India, Brazil, Russia and South Africa.
- China again is at the apex in terms of international liquidity by having maximum foreign exchange reserves to cover its import payments followed by Russia, Brazil, India and South Africa.
- Labour cost which is measured in terms of net workers' remittances is highest in India followed by China, Brazil, South Africa and Russia. It does not mean that the Indian labour is highest paid. Rather, its vice versa, the Indian labour is the least paid and that is why the net workers' remittances (workers' remittances received minus workers' remittances paid) are highest for India immediately followed by China. It is to be noted that both South Africa and Russia rather have a negative net workers' remittances on an average during this period. This is because the remittances paid are higher than remittances received in these two countries.

Table 7.2: A summary of the institutional determinants used in this study to analyze macroeconomic environment of each of the BRICS countries for the period 1995-2015

INSTITUTIONAL DETERMINANTS											
Countries	**Statistics**	**X10**	**X11**	**X12**	**X13**	**X14**	**X15**	**X16**	**X17**	**X18**	**X19**
BRAZIL	**Mean**	2.10	2.71	3.38	10.94	8.40	9.50	2.13	4.00	6.00	5.74
	Median	2.00	3.00	3.00	11.00	8.89	9.65	2.00	4.00	6.00	6.00
	Standard Deviation	0.30	0.59	0.74	0.59	1.28	0.68	0.38	0.00	0.00	0.79
	Minimum	2.00	1.50	3.00	10.00	5.00	8.00	1.50	4.00	6.00	4.00
	Maximum	3.00	4.00	5.00	12.00	10.00	10.50	3.00	4.00	6.00	7.00
RUSSIA	**Mean**	1.10	1.83	2.71	9.08	10.14	8.53	3.76	4.24	5.17	5.13
	Median	1.00	2.00	3.00	9.00	11.00	8.50	4.00	4.50	5.50	5.81
	Standard Deviation	0.30	0.48	0.46	1.41	1.99	1.38	0.44	0.46	0.53	1.55
	Minimum	1.00	1.00	2.00	7.00	5.00	4.00	3.00	3.00	4.00	2.00
	Maximum	2.00	3.00	3.00	12.00	11.50	11.00	4.00	4.50	5.50	6.50
INDIA	**Mean**	3.00	2.52	2.29	9.06	8.30	7.88	4.00	4.05	2.38	4.79
	Median	3.00	2.50	2.50	9.83	8.12	7.62	4.00	4.00	2.50	4.95
	Standard Deviation	0.00	0.43	0.25	1.52	1.20	1.12	0.00	0.59	0.55	0.87
	Minimum	3.00	1.50	2.00	5.00	5.00	6.00	4.00	3.00	1.00	3.50
	Maximum	3.00	3.00	2.50	11.00	11.00	10.00	4.00	5.00	3.00	7.00

INSTITUTIONAL DETERMINANTS											
Countries	**Statistics**	**X10**	**X11**	**X12**	**X13**	**X14**	**X15**	**X16**	**X17**	**X18**	**X19**
CHINA	**Mean**	2.05	2.06	4.27	9.97	10.74	10.21	4.57	2.64	5.00	7.24
	Median	2.00	2.00	4.02	10.00	10.70	10.00	4.50	3.00	5.00	7.50
	Standard Deviation	0.22	0.64	0.50	0.61	0.76	0.62	0.29	0.48	0.71	1.37
	Minimum	2.00	1.00	3.50	9.00	8.00	9.00	4.00	2.00	3.00	4.00
	Maximum	3.00	4.00	5.00	11.00	12.00	11.50	5.00	3.00	6.00	9.00
SOUTH AFRICA	**Mean**	2.14	2.90	3.81	10.52	8.37	9.10	2.57	4.95	5.33	4.61
	Median	2.00	2.50	4.00	10.50	8.00	9.00	2.50	5.00	5.00	4.31
	Standard Deviation	0.36	0.92	0.60	0.73	1.69	0.86	0.58	0.15	0.48	0.87
	Minimum	2.00	2.00	3.00	9.00	5.00	7.50	1.50	4.50	5.00	4.00
	Maximum	3.00	5.00	5.00	12.00	11.00	11.00	4.00	5.00	6.00	7.00

In terms of institutional determinants summarized in Table 7.2 above, following observations can be made for each of the BRICS countries:

- India has the highest rating on bureaucracy quality followed by South Africa, Brazil, China and Russia. This means that India is the most stable country among the group to have policy measures relatively untouched when its government changes.
- In terms of corruption, South Africa gets the maximum ratings on an average followed by Brazil, India, China and Russia. It means that South Africa is the least corrupt country among the BRICS countries.
- China stands at the top in terms of highest ratings on the threat of ethnic tensions within the economy i.e. at the lowest risk followed by South Africa, Brazil, Russia and India. India as a country of cultural diversities and various languages stands at the highest risk of ethnic tensions among the BRICS.
- The threat of external conflict is almost negligible in Brazil which has the maximum ratings near to the maximum score followed by South Africa, China, Russia and India. India since has the lowest ratings among BRICS is prone to foreign pressures on trade restrictions, threat of war etc.
- Chinese government seems to be the most stable among the BRICS as China has got the maximum ratings in government stability. It is followed by Russia, Brazil, South Africa and India. India in this case also stands at the last because of more than one political party fighting to get on the power, thus leading to large scams, red tapism, etc. at the root level.
- China has the least risk of any internal conflict within the economy in terms of any civil disorder or terrorism within the country. It is followed by Brazil, South Africa, Russia and India. India again has the lowest ratings among BRICS in this case meaning thereby that the risk of civil violence or terrorism is inherent in the Indian economy.
- China in the case of law and order mechanisms also comes at the first level among the BRICS followed by India, Russia, South Africa and Brazil. It signifies that the strength and impartiality of legal system in China is much better than the other counterparts in the consortium.
- South Africa has the highest ratings on the risk of involvement of military in politics. It is followed by Russia, India, Brazil and China. As per these ratings, China has the highest risk of military take over.

- In terms of religious tensions, Brazil stands at the top having the maximum ratings indicating no such threat at all. It is followed by South Africa, Russia, China and India. These ratings indicate that India has the highest risk of one religious group dominating the governance of the whole country.
- This is the most crucial factor in terms of institutional factors as this encompasses the basic problems at the root level in most of the developing nations. This includes poverty, unemployment, inequality of income, confidence of consumer in the market which affects the individuals of the economy and the society at large. China has the highest ratings in socio- economic conditions indicating the goodness of the overall macro- economic environment. It is followed by Brazil, Russia, India and South Africa.

The above results indicate that China has been the most preferred destination for the foreign investors because of the above mentioned economic and institutional factors followed by Brazil, Russia, India and South Africa.

A further analysis is done to assess the trend of macro- economic determinants over the period 1983- 2015 (except Russia for which period is considered from 1995-2015) and of institutional determinants over the period 1995-2015 for BRICS countries as a group. Table 7.3 and 7.4 below analyze the trend over the said period to highlight the development process of BRICS nations:

Table 7.3: A summary of the economic determinants used in this study to analyze the macroeconomic environment of BRICS countries as a group for the period 1983 – 2015 (except for Russia, 1995-2015)

ECONOMIC DETERMINANTS										
Years	**Statistics**	**Y**	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**	**X7**	**X8**	**X9**
1983	Mean	0.58	3.20	40.22	40.17	8.77	0.24	155.30	-0.85	6.50	0.54
	Standard Deviation	0.74	6.90	32.25	63.43	5.26	0.15	57.32	16.50	5.67	1.53
1984	Mean	0.82	7.35	43.07	53.69	9.04	0.25	140.13	7.35	6.98	0.46
	Standard	0.73	5.28	33.98	92.36	5.66	0.16	51.56	10.05	4.25	1.32

ECONOMIC DETERMINANTS											
Years	**Statistics**	**Y**	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**	**X7**	**X8**	**X9**
	Deviation										
1985	Mean	0.69	6.39	44.70	64.29	8.97	0.27	125.06	14.16	5.37	0.51
	Standard Deviation	1.02	6.13	33.31	107.90	6.47	0.18	46.81	25.50	3.07	1.34
1986	Mean	0.57	5.43	46.91	45.26	8.74	0.26	112.21	2.07	4.51	0.47
	Standard Deviation	0.88	4.02	33.79	68.13	6.98	0.18	37.38	8.56	2.30	1.27
1987	Mean	0.88	5.35	47.66	65.13	8.89	0.26	111.85	6.61	5.36	0.46
	Standard Deviation	1.12	4.32	32.40	108.87	7.14	0.17	34.11	10.48	2.52	1.53
1988	Mean	1.56	6.26	49.62	167.50	9.08	0.27	110.51	11.90	4.48	0.39
	Standard Deviation	1.67	5.21	33.33	307.76	7.33	0.17	29.93	7.33	2.44	1.35
1989	Mean	1.14	3.96	51.28	366.76	9.13	0.25	117.91	5.88	3.93	0.45
	Standard Deviation	1.60	1.52	34.05	709.34	7.41	0.16	15.71	4.60	2.18	1.48
1990	Mean	1.16	1.51	48.85	743.52	9.45	0.26	110.33	-5.68	3.95	0.49
	Standard Deviation	1.61	3.94	29.66	1469.48	7.52	0.13	9.06	15.28	3.07	1.38
1991	Mean	1.45	2.70	48.32	116.38	9.86	0.26	99.75	4.21	4.44	0.99
	Standard	2.00	4.51	27.95	211.00	8.04	0.12	18.88	11.80	3.67	1.67

ECONOMIC DETERMINANTS											
Years	**Statistics**	**Y**	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**	**X7**	**X8**	**X9**
	Deviation										
1992	Mean	3.37	4.29	48.01	245.91	10.32	0.27	95.84	4.20	4.61	1.13
	Standard Deviation	5.27	7.42	25.75	470.50	8.29	0.10	25.21	12.72	2.74	1.51
1993	Mean	7.34	6.15	50.46	489.66	10.50	0.27	96.70	8.20	5.47	1.08
	Standard Deviation	13.46	5.45	25.84	958.89	8.68	0.10	24.52	17.94	3.40	1.62
1994	Mean	9.55	7.07	53.80	529.82	10.46	0.30	95.18	16.92	6.19	1.90
	Standard Deviation	16.20	4.25	26.14	1030.74	9.09	0.13	22.82	3.36	3.38	2.59
1995	Mean	9.23	4.39	56.68	59.86	8.92	0.35	92.12	8.87	5.16	1.52
	Standard Deviation	14.94	5.66	23.53	80.47	5.41	0.16	24.56	11.74	3.12	2.91
1996	Mean	11.44	4.08	58.43	17.63	9.85	0.33	96.50	-1.83	5.76	2.06
	Standard Deviation	16.57	5.21	23.87	17.16	6.65	0.15	16.40	9.31	4.05	3.73
1997	Mean	15.23	4.13	60.88	8.05	10.62	0.33	103.05	6.01	6.18	2.96
	Standard Deviation	17.57	3.01	24.08	4.33	7.28	0.14	15.47	8.20	4.23	4.65
1998	Mean	16.32	1.92	60.92	10.03	12.06	0.35	98.84	-7.06	6.12	2.48
	Standard	20.10	5.24	23.28	11.14	8.69	0.17	19.11	21.52	4.51	4.13

ECONOMIC DETERMINANTS											
Years	**Statistics**	**Y**	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**	**X7**	**X8**	**X9**
	Deviation										
1999	Mean	14.86	5.15	63.02	19.81	11.37	0.39	84.33	1.71	6.19	3.03
	Standard Deviation	17.55	3.56	21.87	36.96	7.58	0.20	22.19	12.47	3.61	4.71
2000	Mean	16.46	6.12	67.74	7.48	10.67	0.42	86.89	17.01	5.94	2.68
	Standard Deviation	19.53	2.89	21.97	7.84	7.47	0.19	19.09	33.00	2.47	5.45
2001	Mean	17.10	4.51	69.67	7.68	11.80	0.41	85.10	7.74	6.80	2.95
	Standard Deviation	18.56	2.56	21.50	8.04	8.40	0.16	16.82	7.79	3.13	5.93
2002	Mean	15.96	4.88	72.71	7.41	12.07	0.44	81.54	4.19	7.90	3.36
	Standard Deviation	21.56	2.43	21.64	6.13	9.21	0.16	16.45	6.66	3.69	6.32
2003	Mean	16.08	5.85	75.65	7.84	12.20	0.44	84.18	10.09	8.96	4.66
	Standard Deviation	23.66	3.68	19.32	6.05	9.09	0.14	15.85	8.18	4.25	8.60
2004	Mean	21.57	7.10	81.72	5.30	11.34	0.47	86.90	16.46	9.30	4.35
	Standard Deviation	26.98	2.11	19.83	3.62	8.14	0.13	15.90	8.98	4.15	7.57
2005	Mean	29.77	7.10	86.68	5.80	10.73	0.48	92.61	8.95	9.42	4.18
	Standard	41.78	3.24	19.83	4.26	8.04	0.14	10.87	5.32	4.80	9.54

ECONOMIC DETERMINANTS											
Years	**Statistics**	**Y**	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**	**X7**	**X8**	**X9**
	Deviation										
2006	Mean	42.18	7.93	93.46	5.22	10.43	0.50	95.97	13.25	10.95	4.57
	Standard Deviation	52.57	3.38	20.85	3.01	7.63	0.15	5.26	4.15	5.85	13.16
2007	Mean	57.70	8.55	102.18	6.17	9.89	0.50	100.00	14.95	13.55	5.33
	Standard Deviation	58.21	3.47	23.72	2.08	7.57	0.16	0.00	5.23	6.68	18.38
2008	Mean	70.07	5.41	106.23	9.11	9.53	0.53	101.63	8.01	11.44	6.22
	Standard Deviation	61.29	2.51	25.54	3.67	7.39	0.16	8.50	5.92	6.27	25.31
2009	Mean	48.47	1.65	101.84	6.77	10.15	0.43	102.46	-3.75	16.26	7.86
	Standard Deviation	47.66	7.20	26.02	5.01	7.74	0.13	5.69	23.69	9.27	23.18
2010	Mean	81.28	7.19	111.17	6.29	9.84	0.45	113.53	14.98	13.92	9.48
	Standard Deviation	95.93	3.38	28.80	3.44	8.49	0.13	4.67	9.90	8.04	24.65
2011	Mean	95.39	5.50	116.46	6.87	9.43	0.48	116.06	10.44	12.06	11.06
	Standard Deviation	109.04	2.57	30.35	1.74	8.64	0.14	6.63	6.14	6.73	29.27
2012	Mean	81.41	4.20	119.08	5.61	9.11	0.48	113.71	4.53	12.10	10.95
	Standard	94.48	2.46	30.30	2.40	8.84	0.14	5.60	2.55	6.54	33.10

ECONOMIC DETERMINANTS											
Years	**Statistics**	**Y**	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**	**X7**	**X8**	**X9**
	Deviation										
2013	Mean	93.14	4.17	122.02	6.39	9.41	0.48	112.48	1.62	11.84	10.10
	Standard Deviation	113.69	2.83	30.44	2.99	8.63	0.14	12.45	6.28	6.68	34.34
2014	Mean	85.34	3.37	124.31	5.77	9.35	0.46	109.81	0.11	11.54	13.20
	Standard Deviation	107.84	3.58	32.77	2.20	8.86	0.14	15.85	6.67	6.28	33.65
2015	Mean	75.44	1.64	124.85	7.29	9.81	0.45	107.00	-5.23	13.33	15.76
	Standard Deviation	101.99	5.52	38.29	5.35	8.85	0.13	25.92	10.93	6.03	31.16

Following observations on account of economic determinants can be made from the above table for BRICS countries as a group:

- FDI inflows has increased from 0.58 billion USD in 1983 to 75.44 billion USD in 2015 on an average, which is almost 130 times in three decades.
- In terms of GDP growth rates, BRICS have not performed well, it has deteriorated from an average of 3.20% to 1.64%. It is majorly because of low or negative growth rates of Brazil and Russia over this time period.
- The real output measured in terms of Industrial Production Index has gone three times high as compared to the position in 1983, i.e. the average value in 1983 was 40.22 which has increased to 124.85 in 2015.
- The situation of inflation rates has improved significantly, i.e. from a high 135.03% it has dropped down to an average 7.29% in 2015.
- Unemployment rates on an average have been more and less same with a minor increase from year 1983 (8.77%) to 9.81% in year 2015.
- Trade openness also has increased over these years with a small addition on an average from year 1983 (0.235%) to 0.45% in 2015.
- A fall in the Real Effective Exchange Rate on an average can be seen from the year 1983 (155.30) to 107.00 in the year 2015 meaning thereby that the net exports would have gone high as the domestic goods become more competitive.
- BRICS performance in annual percentage growth rates of gross capital formation has deteriorated even further as compared to 1983. On an average BRICS had -0.85% gross capital formation growth rate which has fallen down to -5.23% in 2015.
- International liquidity has gone two times high in 2015 as compared to 1983, i.e. the import cover ratio has improved from an average of 6.50 months to 13.33 months.
- In terms of labor cost, net workers' remittances have increased almost 29 times during this period. From an average of 0.54 million USD, it has increased to 15.76 million USD.

Table 7.4: A summary of the institutional determinants used in this study to analyze the macroeconomic environment of BRICS countries as a group for the period 1995 – 2015

INSTITUTIONAL DETERMINANTS											
Years	**Statistics**	**X10**	**X11**	**X12**	**X13**	**X14**	**X15**	**X16**	**X17**	**X18**	**X19**
1995	Mean	2.80	3.60	3.80	10.60	6.20	10.00	3.80	3.80	5.20	6.40
	Standard Deviation	0.45	0.89	1.64	1.34	1.30	1.22	0.84	1.30	1.30	0.89
1996	Mean	2.60	3.00	4.00	10.60	8.00	9.80	4.00	3.80	5.20	5.60
	Standard Deviation	0.55	1.22	1.41	1.95	2.45	1.30	0.71	1.30	1.30	1.14
1997	Mean	2.20	3.00	3.60	11.60	10.00	10.00	3.60	4.00	5.20	5.40
	Standard Deviation	0.84	1.22	1.14	0.55	1.22	0.71	1.14	1.22	1.30	1.14
1998	Mean	2.00	2.60	3.20	9.40	9.80	9.00	3.40	4.00	5.20	5.00
	Standard Deviation	0.71	0.55	0.84	2.70	1.64	0.71	1.14	1.22	1.30	1.73
1999	Mean	2.00	2.40	3.00	9.60	9.20	7.80	3.20	3.60	4.80	4.00
	Standard Deviation	0.71	0.89	1.00	1.14	2.39	2.28	1.30	1.14	1.64	1.22
2000	Mean	2.00	2.20	2.80	9.00	10.60	8.20	3.00	3.60	4.20	3.80
	Standard Deviation	0.71	1.10	0.84	1.73	0.89	1.48	1.00	1.14	1.79	1.10
2001	Mean	2.00	2.00	2.80	9.90	9.20	8.80	3.00	3.60	4.40	5.10

INSTITUTIONAL DETERMINANTS											
Years	**Statistics**	**X10**	**X11**	**X12**	**X13**	**X14**	**X15**	**X16**	**X17**	**X18**	**X19**
	Standard Deviation	0.71	1.00	0.84	1.14	1.99	1.10	1.00	1.14	1.67	1.56
2002	Mean	2.00	1.50	3.00	9.50	8.70	8.80	3.10	3.90	4.00	5.00
	Standard Deviation	0.71	0.61	1.22	1.66	2.51	1.40	1.47	0.82	1.87	1.27
2003	Mean	2.00	2.20	3.00	10.20	9.80	9.50	3.30	4.00	4.50	5.30
	Standard Deviation	0.71	1.04	1.22	0.91	1.35	1.46	1.25	0.61	2.00	1.52
2004	Mean	2.00	2.10	3.50	10.40	9.80	9.60	3.50	4.10	4.80	5.20
	Standard Deviation	0.71	0.22	1.00	0.65	1.64	1.34	0.94	0.74	1.35	1.52
2005	Mean	2.00	2.10	3.40	10.10	9.40	9.20	3.50	4.10	4.80	6.00
	Standard Deviation	0.71	0.42	0.82	0.65	1.98	1.04	0.94	0.74	1.35	1.90
2006	Mean	2.00	2.10	3.40	9.80	9.40	8.80	3.50	4.10	4.80	5.70
	Standard Deviation	0.71	0.42	0.82	1.04	1.52	1.30	0.94	0.74	1.35	1.82
2007	Mean	2.00	2.30	3.40	9.90	9.30	9.00	3.40	4.10	4.80	6.00
	Standard Deviation	0.71	0.27	0.82	0.82	1.82	1.46	1.08	0.74	1.35	1.90
2008	Mean	2.00	2.50	3.40	9.60	8.90	8.70	3.40	4.10	4.80	5.70

INSTITUTIONAL DETERMINANTS											
Years	**Statistics**	**X10**	**X11**	**X12**	**X13**	**X14**	**X15**	**X16**	**X17**	**X18**	**X19**
	Standard Deviation	0.71	0.35	0.82	1.47	2.33	1.44	1.08	0.74	1.35	1.44
2009	Mean	2.00	2.50	3.20	9.60	9.30	8.60	3.40	4.10	4.80	5.90
	Standard Deviation	0.71	0.35	0.57	1.47	1.25	1.29	1.08	0.74	1.35	1.39
2010	Mean	2.00	2.40	3.20	9.80	9.30	9.40	3.40	4.10	4.80	6.00
	Standard Deviation	0.71	0.42	0.57	0.67	1.25	1.08	1.08	0.74	1.35	1.46
2011	Mean	2.00	2.36	3.32	9.74	9.24	8.90	3.42	4.10	4.80	5.86
	Standard Deviation	0.71	0.25	0.70	1.05	1.52	1.08	1.05	0.74	1.35	1.52
2012	Mean	2.00	2.41	3.30	9.73	9.21	8.92	3.40	4.10	4.80	5.89
	Standard Deviation	0.71	0.27	0.68	1.07	1.56	1.04	1.08	0.74	1.35	1.47
2013	Mean	2.00	2.43	3.28	9.69	9.19	8.90	3.40	4.10	4.80	5.87
	Standard Deviation	0.71	0.32	0.65	1.12	1.55	0.96	1.08	0.74	1.35	1.42
2014	Mean	2.00	2.42	3.26	9.71	9.25	8.94	3.41	4.10	4.80	5.90
	Standard Deviation	0.71	0.31	0.62	1.06	1.41	0.88	1.07	0.74	1.35	1.43
2015	Mean	2.00	2.41	3.27	9.73	9.24	9.01	3.41	4.10	4.80	5.91

INSTITUTIONAL DETERMINANTS											
Years	**Statistics**	**X10**	**X11**	**X12**	**X13**	**X14**	**X15**	**X16**	**X17**	**X18**	**X19**
	Standard Deviation	0.71	0.31	0.64	0.98	1.45	0.85	1.07	0.74	1.35	1.44

From Table 7.4, following points can be summarized in the context of institutional determinants of BRICS countries as a group for the period 1995-2015. As per the ICRG Methodology issued by the PRS Group from where the data on institutional determinants (country risk ratings used as proxy) has been extracted, a fall in the value of ratings over a period of time symbolizes more risk and vice versa:

- In terms of bureaucracy quality, corruption, external conflict and internal conflict the performance of BRICS has diminished.
- In terms of ethnic tensions, law and order mechanism, and socio- economic conditions the situation is almost the same with a slight fall in the average ratings.
- The situation of BRICS as a group has improved significantly in terms of government stability, military in politics and religious tensions.

The above analysis shows that each of these five countries has varied strengths and capabilities because of which some of them are leaders in some areas whereas some others are laggards in those areas.

The significant factors discussed in this study are only one set of reasons explaining such phenomenon. However, it also depends on the kind of structure of their economies and the process of economic development which these countries have gone through over these years. Therefore, the next section discusses these trends and patterns of economic development in each of these five countries deeply and also analyzes the structure of their economies which in turn makes a difference in their positions in the world forum in terms of being leaders and laggards in attracting FDI.

7.3 Current structure of economy, phases of economic development and trends and patterns of FDI in each of the BRICS countries:

This section of the study shows some basic characteristics of these five countries with respect to their economic structure and also the phases of economic development over years.

(I) Brazil

(a) Current structure of the economy as on 2015: As per the World Development Indicators (WDI) issued by the World Bank, as on 2015, Brazil has a population base of 207.85 million people (5th largest country in the world and represent 2.83% of the world's total population), a GDP level of 1.77 trillion USD (9th largest country in the world and represent 2.39% of the world's total GDP levels) with an overall surface area of 8.52 million square kilometers (5th largest country in the world and represent 6.34% of the world's total surface area in sq. km.). All these facts make it an attractive destination for the Multinational Corporations (MNCs) investing via FDI route and that is the reason it holds second position in attracting maximum FDI net inflows (average FDI net inflows of 27.12 bn. USD) among the BRICS during the past three decades.

However, in terms of certain economic and institutional factors, it still needs to work harder and improvise its processes. For instance, among 189 countries of the world, it has a GDP per capita level of 8538.59 USD (stands at 173 rank); in terms of ease of doing business index, it is placed at 120 position; in the parameter on start up procedures to register a business, it holds a very low position of 162 and even lesser rank on account of time required to start a business, i.e. 181. Brazilian economy has also been the topper in having the highest average inflation rates over the last three decades as compared to other four countries in the group leading to a possibility of higher cost of production. But, the data also shows that Brazilian economy does not have any threat of external conflict and religious tensions making it very convenient for the foreign investors to operate freely in this country.

(b) Phases of economic development: As per a report "Country Economic Forecast Brazil" published by the Oxford Economics (2017), following are some of the major events that highlights how the Brazilian economy has developed over these years:

- 1950- 1980: Brazil was one of the fastest growing economies in the world with an average yearly growth rate of over 7% because of industrialization process within the country. This led to a scenario of high inflationary pressures, huge fiscal and external deficits and a mounting public debt.
- 1982: Major debt crisis which acted as a major shock to the Brazilian economy leading to reduction in capital flows, macroeconomic instability and very high inflation rates.
- 1986-1994: Stabilization plans for currency were brought which proved to be unsuccessful. During this period, the name of the Brazilian currency was changed four times but all in vain. During 1990s, country also initiated the process of trade liberalization.
- 1994: Brazil's new currency Brazilian Real was launched to bring macroeconomic stability.
- 1997-1998: Asian and Russian crises hit the Brazilian economy badly with rising public debts, huge current account deficits and an overvalued currency (Brazilian Real) leading to very active speculative trading in it swinging the investor's sentiments.
- 1999: Transition of the economy to a macro economic framework based on three pillars of floating exchange rate system, inflation targeting mechanisms and primary fiscal surpluses under the supervision of the then President Fernando Henrique Cardoso (1994-2002).
- 2002: Uncertainty about the new government led to weak financial sentiments all across the country. Electoral risk, weak public debt structure, and lack of interest of international capital markets in the economy were major sources of unstable Brazilian economy.
- 2003- 2010: A period of robust GDP growth rates during the first term of the new President Luiz Inácio Lula da Silva. Debt burden was significantly reduced coupled with low inflation rates and continuous improvement in terms of trade.
- 2011: Lula's PT party won its third presidential election in a row with Dilma Rousseff as their new President. A new macro economic framework emphasizing on increased political interference in the central bank, statistical agencies, public banks and state-owned companies was launched.

- 2011-2015: Due to this 'New Economic Matrix (NEM)' launched by Dilma Rousseff, investment in Brazil fell from 21% to 16% of GDP. During 2015-16, 7-8% cumulative contraction in GDP is the worst performance over a century. Inflation rates have risen the Brazilian Central Bank's target of 4- 5% every month hitting the creditability of the bank badly. Another worse effect of this NEM is the upsurge movement in public debt, which jumped from 53% of GDP in 2013 to nearly 70% in 2016, costing Brazil the loss of its investment-grade status in 2015.

(c) FDI Inflows by Country and Industry

Brazil is the largest recipient of FDI inflows in the Latin America, 7th largest recipient in the world, and 2nd largest in terms of FDI net inflows among BRICS. As of 2015, following are the top five investing countries and industries from where and in which maximum FDI inflows have come in Brazil respectively:

Table 7.5: Top 5 investing countries and industries getting maximum FDI inflows in Brazil in 2015

Name of Country	Percentage of FDI inflows	Name of Industry	Percentage of FDI inflows
Netherlands	20.00	Trade	09.00
United States	12.00	Oil and Gas	08.00
Luxembourg	11.00	Telecommunications	08.00
Spain	11.00	Automobile	08.00
Germany	06.00	Electricity	07.00

Source: Central Bank of Brazil (www.bcb.gov.br) (Accessed on 30-05-2017)

(II) Russia

(a) Current structure of the economy as on 2015: As per the WDI issued by the World Bank, as on 2015, Russia has a population base of 144.10 million people (9th largest country in the world and represent 1.96% of the world's total population), a GDP level of 1.33 trillion USD (12th largest country in the world and represent 1.78% of the world's total GDP levels) with an overall surface area of 17.10 million square kilometers (1st largest country in the world and represent 12.73% of the world's total surface area in sq. km.). All these facts make it an attractive destination for the MNCs investing via FDI route and that is the reason it holds third position in attracting FDI net inflows (average FDI net inflows of 24.52 bn. USD) among the BRICS during the past three decades.

Russia also has an advantage over all other four counterparts in this group in terms of holding 35th position in ease of doing business index and 19th rank in start- up procedures to register a business in comparison to 189 countries of the world. In terms of openness of trade also, during the last three decades, Russia tops the charts among the BRICS and thus become a favourite place for FDI players. However, it needs to improvise its processes for reducing the time required to start a business in which it holds 74th place and in per capita GDP level of 9057.11 USD where it holds 67th position in the world.

(b) Phases of economic development: As per a report "Country Economic Forecast Russia" published by the Oxford Economics (2017), following are some of the major events that highlight how the Russian economy has developed over these years:

- 1975- 1985: Corruption and data falsification along with bureaucracy was a common practice.
- 1986-1991: Russia moved towards a market-oriented socialist economy culminating the breakup of Soviet Union in 1991. On 26 December, 1991, an era marked by a wide range of political, economic and social crises finally came to an end.
- 1991-1998: Russia underwent a drastic transformation which converted its basic structure of a centrally planned economy into a market economy which was globally integrated.
- 1999-2007: It was the period of recovery for Russia where it came out of a massive 1998 financial crisis and that too with flying colours. The reason for such a recovery was devaluation of the Russian Ruble, which made domestic producers in Russia more competitive not just nationally but also internationally.
- 2007-2012: Another good phase in the Russian economy was this period where boom in commodity prices and oil prices as well as a cautious approach in framing economic and fiscal policies led to a rapid growth in the standard of living, raising the real disposable income which in turn drastically impacted the unemployment rates and poverty rates by reducing them to almost 50%.
- 2014- 2015: A risk of Russia going into recession rose in early 2014 because of three major reasons. Firstly, the falling oil prices; secondly, the intervention of Russian Army in Ukraine and lastly, the high outflow of capital. It's GDP growth rate

remained positive at 0.6% in 2014, however, it was decreased by 3.7% in the year 2015.

(c) FDI Inflows by Country and Industry

Russia comes at 3rd rank among BRICS in attracting FDI net inflows. As of 2015, following are the top five investing countries and industries from where and in which maximum FDI inflows have come in Russia respectively:

Table 7.6: Top 5 investing countries and industries getting maximum FDI inflows in Russia in 2015

Name of Country	Percentage of FDI inflows	Name of Industry	Percentage of FDI inflows
Cyprus	28.80	Trade	28.30
Luxembourg	11.50	Manufacturing	23.90
Netherlands	10.70	Financial Services and Insurance	13.90
Ireland	07.70	Mining and Quarrying	13.00
Bahamas	06.90	Real Estate	04.30

Source: Central Bank of Russia (www.cbr.ru) (Accessed on 30-05-2017)

(III) India

(a) Current structure of the economy as on 2015: As per the WDI issued by the World Bank, as on 2015, India has a population base of 1311.05 million people (2nd largest country in the world and represent 17.85% of the world's total population), a GDP level of 2.07 trillion USD (7th largest country in the world and represent 2.79% of the world's total GDP levels) with an overall surface area (in square kilometers) of 3.29 million (makes it 7th largest country in the world which represents 2.45% of the world's total surface area in sq. km.). All these facts indicate about the capabilities of India to be a favourite destination for the foreign players, however, it holds only fourth position in attracting FDI net inflows (average FDI net inflows of 11.05 bn. USD) among the BRICS during the past three decades.

India needs to work really hard in all other factors impacting the FDI decision of MNCs like in terms of ease of doing business index, it comes on 130th position out of 189 countries of the world. It also has a disadvantage of long start- up procedures to register a

business because of which it falls on 177th place in the world. The country is also not doing anything better in time required to start a business where it is at 144th rank in the world. The situation at the GDP per capita front is no different where it falls in the bottom position at 145th place out of 189 countries of the world. In terms of very high unemployment rates and labour cost, it has to put its earnest endeavours to correct the situation otherwise it may signal a bad image among the investors putting their funds in India. Although there are various issues where it is a laggard, still some of the most important areas where it is proving its mettle are acquiring 2nd position among BRICS in terms of GDP growth rates, Industrial production Index and high gross capital formation growth rates. Thus, if it continues to work in this direction, it may achieve higher ranks in other indicators too and remain as a top destination for FDI.

(b) Phases of economic development:

- 1947-1980: FDI was discouraged with the five industrial policies during that time. First, ceilings were put on the overall profit remittances of foreign MNCs operating in various sectors. Second, foreign equity holdings were restricted by the Foreign Exchange Regulation Act (FERA), 1973. Thirdly, to ensure that no monopolistic powers should emerge in any sector, Monopolistic and Restrictive Trade Practices (MRTP) Act, 1969 was put in place which actually restricted the growth of firms. Fourthly, a license regime was mandatorily to be followed by all the firms engaged in manufacturing, exports and imports which stipulated that licences had to be obtained from the concerned ministries for any expansion in these areas of operation. Lastly, price setting mechanism was controlled by the government in a number of necessity goods sectors, such as pharmaceuticals, in order to provide accessibility to the poor section of the society.
- 1980-1990: A period marked by the maturing phase of all the political parties, industries etc. Concept of free market was promoted within India during this period.
- 1990-2007: Economic reforms of Liberalization, Privatization and Globalization (LPG) were introduced in 1991. Processes for obtaining industrial licenses, price control mechanisms, procedures for obtaining foreign technology agreement, reduction of excise duty, etc. were few of those steps taken under the LPG reforms.

India signed General Agreement on Tariffs and Trade (GATT) and also became a member of the World Trade Organization (WTO) during this period.

- 2007-2015: Global financial crisis hit almost the whole world with a very mild impact on India because of its strong fundamentals. As per the new national accounts data released in 2015, the expected growth rate of India is 7% making it stand next to its Asian counterpart, China.

(c) FDI Inflows by Country and Industry

India holds 13th position globally in attracting the highest FDI inflows. It comes at 4th rank among BRICS in attracting FDI net inflows. In terms of Greenfield investments (an investment where an MNC builds its operation facilities in a host country from the ground level), India outshined even China and the U.S. to become world's top most destination for capital investments in 2015. As of 2015, following are the top five investing countries and industries from where and in which maximum FDI inflows have come in India respectively:

Table 7.7: Top 5 investing countries and industries getting maximum FDI inflows in India in 2015

Name of Country	Percentage of FDI inflows	Name of Industry	Percentage of FDI inflows
Mauritius	36.00	Financial Services (includes both financial and non- financial services like banking, outsourcing, R&D, etc.	17.00
Singapore	16.0	Construction Development (includes townships, housing and built-up infrastructure)	09.00
United Kingdom	08.00	Computer software & hardware	07.00
Japan	07.00	Telecommunications (includes radio, cellular mobile and basic telephone services)	07.00
United States	06.0	Automobiles	5.00

Source: Department of Industrial Policy and Promotion (DIPP), Ministry of Commerce and Industry (http://dipp.nic.in) (Accessed on 30-05-2017)

(IV) China

(a) Current structure of the economy as on 2015: As per the WDI issued by the World Bank, as on 2015, China has a population base of 1371.22 million people (the largest country in the world and represent 18.66% of the world's total population), a GDP level of 10.87 trillion USD (2^{nd} largest country in the world and represent 14.63% of the world's total GDP levels) with an overall surface area of 9.56 million square kilometers (4^{th} largest country in the world and represent 7.12% of the world's total surface area in sq. km.). Results of this study prove that over the last three decades, China has the highest GDP growth rates on an average representing the large market size and growth prospects, it also has the highest gross capital formation growth rate along with a maximum international liquidity ratio. In terms of institutional variables also, it is the least risky country in terms of ethnic tensions and internal conflicts. The country also has a strong law and order mechanism in place, a stable government and most importantly conducive environment to work having favourable socio- economic conditions. All these facts make it the most attractive destination for the MNCs investing via FDI route among BRICS and that is the reason it holds first position in attracting FDI net inflows (average FDI net inflows of 85.95 billion USD).

However, the country needs to be vigilant about other concerns impacting the FDI decisions of MNCs in which it is a laggard. For instance, in ease of doing business index, it holds 79^{th} position among 189 countries of the world. For start- up procedures to register a business, it is at 163^{rd} place and on the parameter of requirement of time to initiate a business, it is at 153^{rd} rank. The GDP per capita is quite low too, i.e. 7924.65 USD only (76^{th} rank in the world). This clearly represents that it might be a top destination for FDI among BRICS but certainly not in the world.

(b) Phases of economic development:

- 1979: Implementation of economic reforms.
- 1980s: During this phase, reforms were made to give freedom to its farmers and peasants from the rigid structure of centralized planning related to agricultural sector and its price discovery mechanisms. These reforms were primarily focused on converting its agricultural sector into an efficient and ever growing sector.

- 1990s: Like agriculture sector, reforms were initiated in the industrial sector to attract foreign investors for the first time. It was done with the help of liberalizing the banking sector and capital market.
- 1978- 2005: During this period, Chinese economy entered into new verticals of manufacturing processes. It encouraged its industries to engage in the production of computers, pharmaceuticals, and automobiles. This was a step beyond their initial success in the manufacturing of clothing and footwear. An obvious low- cost labour advantage was evident during this phase also.
- 2014- 2015: Recently, China announced some measures to resurrect its slowing GDP growth rate which includes plans to build a multi layer transport network which will comprise of developing airports, railways and roads so that a new economic belt is created alongside the Yangtze River.

(c) FDI Inflows by Country and Industry

China comes at 1st rank among BRICS in attracting FDI net inflows. As per the 2016 World Investment Report published by UNCTAD, China holds 3rd position globally as the top recipient of FDI inflows. As of 2016, following are the top five investing countries and industries from where and in which maximum FDI inflows have come in China respectively:

Table 7.8: Top 5 investing countries and industries getting maximum FDI inflows in China in 2016

Name of Country	Percentage of FDI inflows	Name of Industry	Percentage of FDI inflows
Hong Kong	69.00	Manufacturing	43.20
Singapore	05.00	Real estate	20.90
Republic of Korea	04.00	Business Services and renting	06.20
United States	03.00	Trade (wholesale and retail)	05.70
Macao	03.00	Transportation, storage facilities, telecommunications and postal services	02.00

Source: Public Information Services- Invest in China (http://fdi.gov.cn) (Accessed on 30-05-2017)

(V) South Africa

(a) Current structure of the economy as on 2015: As per the WDI issued by the World Bank, as on 2015, South Africa has a population base of 54.96 million people (24th largest country in the world and represent 0.75% of the world's total population), a GDP level of 0.31 trillion USD (31st largest country in the world and represent 0.42% of the world's total GDP levels) with an overall surface area of 1.22 million square kilometers (24th largest country in the world and represent 0.91% of the world's total surface area in sq. km.). The country has a per capita GDP level of 5691.69 USD (93rd rank in the world). Over the past three decades, South Africa has the highest average Industrial Production Index among the BRICS which indicates about the capabilities of South Africa to become a favourite destination for the MNCs investing through FDI, however, it holds last position in attracting FDI net inflows (average FDI net inflows of 2.39 bn. USD) among the BRICS during the past three decades. There are some other positives about South African economy too like it is proven in this study that it is the least corrupt country and has the least risk of military take over among BRICS. Also, it has got better prospects to attract these foreign players as it stands next to Russia (among the BRICS) in terms of holding 71st position in ease of doing business index which is better than Brazil, India and China.

South Africa needs to put efforts in other factors impacting the FDI decision of MNCs like in terms of start- up procedures to register a business, it comes on 86th position out of 189 countries of the world. It also has a disadvantage of very long time required to start a business where it is at 168th rank in the world. Another problem that the country needs to combat is very high unemployment rates over the past thirty years.

(b) Phases of economic development:

- 1960-80: The economy grew at an annual rate of 4.5%, supported by abundant natural resources. However, in the 1980s South Africa's over-reliance on natural resources, coupled with the effect of economic sanctions and falling investment, ushered in a long period of stagnating economic growth.

- 1994: This was still the legacy Nelson Mandela and the African National Congress (ANC) inherited when they won the first multi-party elections.
- 1994-2005: The ANC government has achieved mixed success in turning the economy around. Growth over the period averaged 3.3% p.a., more than double the rate in 1980-94,
- 2006- 2007: Growth rate accelerated to over 5%. This was achieved by strengthening public finances and by integrating the South African economy with the rest of the world, which resulted in higher productivity growth.
- 2007- 2015: Growth moderated to about 2.8% with a major recession in 2008-09. It is expected that the economy will grow only modestly over the coming years, as the country faces a wide range of structural obstacles to stronger growth which includes high unemployment rates, strenuous labour market relations and the legacy of under-investment.

After the above discussion it is clear that it is not just some set of determinants that can affect the decision of MNCs to invest in a particular country. It also depends on the country's stage of economic development, the strengths a country possesses and also on some weaknesses that adversely affect the position of a country vis-à-vis its competitors. Therefore, the next section highlights a comparative analysis of all such strengths and weaknesses of BRICS countries due to which they may be considered better than others for the foreign investors.

(c) FDI Inflows by Country and Industry

South Africa comes at last position among BRICS in attracting FDI net inflows. Being a new entrant in the BRICS (formally joined the group in 2010), it has a lot of potential and a rapid rate of growth to soon become an important recipient of FDI inflows in future. As of 2015, following are the top five investing countries and industries from where and in which maximum FDI inflows have come in South Africa respectively:

Table 7.9: Top 5 investing countries and industries getting maximum FDI inflows in South Africa in 2015

Name of Country	Percentage of FDI inflows	Name of Industry	Percentage of FDI inflows
United Kingdom	29.50	Financial Services, real estate and business services	40.70
Netherlands	24.20	Manufacturing	28.90
United States	04.90	Mining	15.90
Germany	03.30	Transport, storage and communication	10.00
Luxembourg	02.00	Trade, catering and accommodation	04.00

Source: South African Reserve Bank (https://www.resbank.co.za) (Accessed on 30-05-2017)

7.4 Comparative Analysis of BRICS' economic structures

The following analysis highlights the major differences among these economies in terms of their economic structures which gives a better insight to the MNCs and the policy makers to make their FDI policy decisions in the respective economies.

Table 7.10: Comparative Analysis of BRICS' economic structures

Point of comparison	Brazil	Russia	India	China	South Africa
Population base	*207.85 million people *5th largest country in the world *2.83% of the world's total population	*144.10 million people *9th largest country in the world *1.96% of the world's total population	*1311.05 million people *2nd largest country in the world *17.85% of the world's total population	*1371.22 million people *the largest country in the world *18.66% of the world's total population	*54.96 million people *24th largest country in the world *0.75% of the world's total population
Overall surface	*8.52 mn.	*17.10 mn.	*3.29 mn.	*9.56 mn.	*1.22 mn. sq.

Point of comparison	Brazil	Russia	India	China	South Africa
area	sq. km. *5th largest country in the world *6.34% of the world's total surface area	sq. km. *the largest country in the world *12.73% of the world's total surface area	sq. km. *7th largest country in the world *2.45% of the world's total surface area	sq. km. *4th largest country in the world *7.12% of the world's total surface area	km. *24th largest country in the world *0.91% of the world's total surface area
FDI net inflows	* 75.07 bn. USD *7th largest recipient in the world	*6.48 bn. USD *40th largest recipient in the world	*44.01 bn. USD *13th largest recipient in the world	*249.86 bn. USD *2nd largest recipient in the world	*1.52 bn. USD *76th largest recipient in the world
GDP Growth Rate	*-3.77% *180 rank	*-2.83% *179 rank	*7.93% *7 rank	*6.92% *13 rank	*1.26% *144 rank
GDP level	*1.77 trillion USD *9th largest country in the world *2.39% of the world's total GDP levels	*1.33 trillion USD *12th largest country in the world *1.78% of the world's total GDP levels	*2.07 trillion USD *7th largest country in the world *2.79% of the world's total GDP levels	*10.87 trillion USD *2nd largest country in the world *14.63% of the world's total GDP levels	*0.31 trillion USD *31st largest country in the world *.42% of the world's total GDP levels
GDP per capita level (among 189 countries of the	*8538.59 USD *173 rank	*9057.11 USD *67 rank	*1581.59 USD *145 rank	*7924.65 USD *76 rank	*5691.69 USD *93 rank

Point of comparison	Brazil	Russia	India	China	South Africa
world)					
Ease of doing business index	*120 rank	*35 rank	*130 rank	*79 rank	*71 rank
Start up procedures to register a business	*162 rank	*19 rank	*177 rank	*163 rank	*86 rank
Time required to start a business	*181 rank	*74 rank	*144 rank	*153 rank	*168 rank

The above analysis should be combined along with the next section of this study which elaborates on a very important question i.e. what are the capabilities and weaknesses of these economies which may induce or restrain the MNCs to enter into these markets.

7.5 Analysis of strengths and weaknesses of BRICS countries individually

After the in depth analysis of the nature of each of these economies and their stages of economic development, a comparative analysis of BRICS countries is presented below which addresses the question 'why should an MNC make FDI in BRICS countries?' This analysis will help to understand the future challenges posed in front of these five countries individually and also BRICS as a group:

Table 7.11: Strengths and Weaknesses Analysis of Brazil

Strengths	Weaknesses
- Market size consisting of approximately 210 million inhabitants - Large pool of workers with varied levels of education	- Country's economic crisis - Large scandals - High rate of inflation - Complex taxation mechanism

Strengths	Weaknesses
- Raw materials are easily accessible - Economic systems are well diversified making it less prone to international crises - Easy access to other South American markets - Least threat of external conflicts, internal conflicts and religious tensions - Good socio- economic conditions in the economy	- Bureaucratic delays leading to high regulatory risk - Rigid labour legislation - FDI restricted in various areas like aviation, insurance, media etc. - Very low rank on the parameter 'ease of doing business index' - Very lengthy procedures to register a business - Very long waiting time to start a new business

Table 7.12: Strengths and Weaknesses Analysis of Russia

Strengths	Weaknesses
- Ample availability of natural resources - Investment potential under- utilized in sectors like transport, communications, information Technology (IT) and Information Technology Enabled Services (ITES), automobiles and aeronautics etc. - Qualified work force at all levels - Trade openness - 35th position in the world in 'ease of doing business index' - 19th position in the world in start- up procedures to register a business	- Geopolitical tensions between Russia, Ukraine and western countries leading to an unpredictable investment climate - Contradictory and complex accounting regulations - Infringement of intellectual property rights - No entry of foreign investors in sectors like textiles, machine tools etc. - High administrative problems - High corruption levels - Uncertainty about regional stability - Long waiting time to start a new business

Table 7.13: Strengths and Weaknesses Analysis of India

Strengths	Weaknesses
- Very huge market size in terms of population base of 1.31 billion people - High prospects of growth potential in terms of rapid increase in GDP growth rates	- High levels of corruption - Undue political and bureaucratic pressures - Full or partial restriction on FDI in some sectors like agriculture, railways,

Strengths	Weaknesses
- Fast improvements in real production output measure by Industrial Production Index - Three tiered democratic system that ensures a stable political environment - Well developed and an independent judicial system - Huge repository of natural resources and raw material - Availability of educated workforce at all levels - Large variety of consumers as takers in the market of manufactured goods and services - Proximity to manufacturing sites, easy access to suppliers and less development costs	power generation & distribution (though it is gradually getting privatized now), life and medical insurance (it is also opening up slowly), manufacturing of arms, explosives, atomic energy and aerospace - Weak infrastructure facilities along with inadequate security and safety in certain areas - World's most complex and stringent labour regulations leading to increase in net workers' remittances - Root level problems of unemployment, poverty and inequality of income leading to low purchasing power in hands of public at large - In terms of ease of doing business index, it comes on 130th position out of 189 countries of the world - Very long start- up procedures to register a business (177th place in the world) - Long time required to start a business (144th rank in the world)

Table 7.14: Strengths and Weaknesses Analysis of China

Strengths	Weaknesses
- Largest market size in the world with 1.37 billion population - 2nd largest GDP level in the world showing huge growth prospects and market potential - Very high gross capital formation rate - Sound and well managed international liquidity - Very less risk of ethnic tensions and internal conflicts - Strong law and order mechanism	- Ever changing legal context - Bureaucratic hassles and complexities - Lack of transparency in transactions - High corruption levels at all levels - Weak intellectual property rights protection - No opportunities for FDI in some sectors where monopoly exists like weapons, telecommunications, energy, environment, high technology, water supply, electricity, distribution services

Strengths	Weaknesses
- Stable government - Conducive environment measured by sound socio- economic conditions - Relatively lower labour cost - Development of new provinces like Sichuan offering new opportunities	- Very rigid cultural practices- difficult for foreign MNCs to adopt and practice - Low ranking in ease of doing business index (79th in the world) - Bad position on account of start- up procedure to register a business (163rd place in the world) - Poor ranking on the parameter of time required to start a business (153rd rank across the world)

Table 7.15: Strengths and Weaknesses Analysis of South Africa

Strengths	Weaknesses
- Demographic advantage - Diversified, productive and advanced economy - Abundant natural resources - High rate of growth in industrial production index - Transparent legal system - Political stability up to a certain level - Less corrupt systems - Macro- economic stability due to economic reforms - Well developed infrastructure - Sectors like production, financial services, tourism and retail have a high potential of growth	- High crime rate - Increasing number of labour strikes and demonstrations leading to social unrest - Lack of electricity supply and logistics - Lack of clarity and awareness about the policies and structural reforms - Very high unemployment rates - Lack of high- skilled labour - Strict laws of immigration making it difficult to hire foreign workers - Import- export processes are also cumbersome - Entry of foreign MNCs still restricted in few sectors like banking, insurance and broadcasting. Also, there are restrictions on the level of borrowings that these foreign MNCs can do - Low ranking in terms of start- up procedures to register a business (86th position in the world) - Very long time required to start a business (168th rank in the world)

7.6 Insights provided during Primary Data Analysis

The eminent policy makers, presently holding offices in Ministry of Finance and Ministry of Commerce and Industry, Government of India were also interviewed to provide their useful insights about all the objectives of the present study. The opinions have been listed down below as per each question asked from them:

i. Do you think there is an impact of FDI inflows on the economic growth of individual BRICS countries? If yes, what is your opinion on this issue?

As per the opinion of the government officials, FDI inflows have positive effects on the growth of the emerging economies. According to them, when FDI comes into a developing countries, it is usually seen that it leads to increase in creation of jobs, better employment opportunities, and more robust supply chains, development of infrastructure facilities where the FDI projects are set up, more integration with the rest of the world and the goodwill of such economies, where FDI is allowed, also increase in the global market.

ii. Do you think is it vice versa, i.e. while these economies are growing, FDI inflow is coming into these countries? If yes, what is your opinion?

The policy makers opined that it is indeed the growing nature of these five economies and their better future growth prospects in terms of rising domestic market size that the foreign investors are induced to invest in these nations. Although, in particular, the rising momentum of Indian economy (as of 2015, GDP growth rate of 7.93% which is highest among the BRICS along with 2.06% contribution in the world's FDI) was highlighted by all the experts among the BRICS. It was shared by them that it is not just the market size that is important for the foreign investors to invest in India but also the recent policy initiatives taken by the present government, like the policy of allowing the FDI players for raising rupee denominated loan in India, 10 years External Commercial Borrowing (ECB) can be raised from the Indian market, investing huge sum of money for the infrastructure development, etc.

With respect to Brazil and Russia, the policy makers emphasized that their growth is commodity driven and thus not affected by the inflows of FDI. The Russian economy is rather seeing a slowing down of the economy due to the ongoing recession, and thus no such positive spillover effects can be seen in this economy (FDI inflows have been

halved as compared to the previous years). A similar scenario is also visible in the Chinese economy also, and thus no such high prospects are anticipated for their economy. Further, South Africa being the newest member nation to join the BRICS and also has recently received the tile of developing country, moving up from the status of a Least Developed Country (LDC), has a moderate growth rate and thus the impetus of FDI inflows also is very normal in this economy. However, the experts pointed out to the various opportunities available for the South African economy in the near future which are described in the forthcoming points.

iii. What is your opinion on determinants impacting their economic growth?

For overall BRICS nations as a group, the experts highlighted security/ safety issues, return on investment and stability in the returns as the three most important determinants impacting the economic growth. They pointed out that these areas are in addition to the other macro- economic and qualitative factors impacting these economies' growth. Some of those determinants are: population size or demographic dividend (percentage of youth in these economies), market size and its growth prospects, FDI inflows, skilled manpower, internet users, transparency in the policies, integrated laws and mechanisms (like in India), rising business opportunities in varied sectors, established businesses in the phase of diversification (like in China), bilateral treaties (like in South Africa), etc.

iv. What is your opinion on determinants impacting their FDI inflows?

In addition to the results of the study shared with them, it was pointed out by the experts that it is the regulatory framework which includes having transparent FDI policies, an enabling atmosphere, the kind of market that the FDI players would cater to, the production tasks and their rate of successful and timely completion, cost of living in the economy, the quality of life of the overall population, the cost advantage over the domestic counterparts, legal and procedural requirements, ease of doing business, etc. which matters to the MNCs investing in the host country and this holds true in the scenario of BRICS countries individually also. Though, there is a lot of scope in the ease of doing business criteria for all the five countries, working upon which would lead to profitable avenues for not just the host country but also the home country.

v. What is your opinion on the common factors impacting FDI inflows in BRICS as a group?

In consonance with the findings of the study, the experts pointed out that it is the rate of growth that these five countries are working on rigorously with the help of improvising both macro- economic and institutional frameworks and a common philosophy to remove the grass root problems existing in these economies so as to achieve that goal is the first reason that is creating a positive environment for the FDI players to invest in these countries. Along with it, their market size, political engagements within the country and with the rest of the world, land mass, etc. are some of the common factors that are influencing the FDI inflows in BRICS as a group.

vi. Could you please comment on the strengths and weaknesses of these economies to become prospective leaders in attracting FDI inflows?

As clearly determined by this study, the experts were in agreement to the strengths and weaknesses that these five countries possess.

vii. Could you please share your opinion on the challenges that these countries are facing in terms of internal and external factors?

The experts pointed out that the challenges for these five countries lie in their weaknesses in which they should work rigorously to achieve the goal of becoming the supreme powers in the world.

viii. What are your views on the prospects of these countries regarding economic growth and FDI inflows?

All the experts had high hopes for the Indian economy among the BRICS to have the highest rate of growth in near future too and turning out to be a leader among the BRICS. However, they also pointed out that the all these five economies must work on the following points to turn their dreams into reality of becoming the super powers in the world and competing with the developed nations in future too:

- There should be no threshold limit on the amount of FDI.
- Development of infrastructure
- Taking the advantage of demographic dividend
- Bring more policy initiatives like the Indian Government, e.g. Skill India, Digital India, Make in India, etc.

- Utilize the latent talent
- Growth of the agriculture sector be bringing technological innovations
- Increasing the incentives for the strengthening the services sector
- Strengthening the political system to have more transparent policies
- Working on the parameters of ease of doing business
- Reducing the current account deficits and improving the position of exports and also foreign exchange reserves
- Engagement with other economies of the world by entering into bilateral and multilateral treaties

Therefore, it can be concluded from the above discussion that these expert opinions are in consonance with the results derived from this study.

7.7 Prospects of BRICS as a group

Having analyzed the strengths and weaknesses of the BRICS countries individually and also after the interviews conducted with the experts, it can be well asserted that these economies have several points of difference leading to various challenges that they are facing currently. Thus, it seems difficult for them to become the most powerful economic group in the next few years. However, one of the most important challenges faced by BRICS as a group is to have consensus on the issue of global governance. Lukyanov (2011) elaborates the situation as under:

"China prefers infiltrating into the status quo in order to quietly transform it later. India is busy addressing specific problems with specific Western countries – the US, Germany and France. Brazil is using the situation to strengthen its positions in the Western hemisphere. South Africa is away on the periphery. And Russia, as usual, is trying on all hats at once, seeking to be everywhere and with everyone."

The above statement has got deeper implications regarding the differences among these countries than it sounds. The volume of trade between these BRICS countries is inadequate, their industries do not complement each other, and their information exchange is also very weak. Also, it is to be noted that all these five nations are competitors on the international platform. For example, in the WTO, a large number of complaints against the Chinese MNCs, on account of lack of transparency in transactions and infringement of intellectual property rights, have been initiated by Brazil. Other grave issues among BRICS are for instance the security matters between China and India

on their territorial borders. In addition to this, there are differences within the group on issues like values and ethics; economic, political and geopolitical interests and that could be a reason that the group is incapable of playing a leading role in the world as compared to other economic blocs of developed countries.

7.8 Summary of results derived for Objective 4 (Tables 7.1- 7.4 discussed above in this chapter)

Following figure 7.1 summarizes the results derived in Tables 7.1- 7.4 elaborating the ranks of these countries assessed on the basis of their performance in the context of economic and institutional determinants affecting the macro- economic and institutional quality of these countries. The figure also displays the overall ranking of theses five countries on the basis of the leader- laggard ratio computed with the help of the above determinants. The right hand side of the figure also summarizes the period- wise performance of BRICS in the context of both economic and institutional determinants so that future opportunities available with the BRICS as a group can be discussed in tune with the past trends and patterns observed in these economies.

Figure 7.1: Flowchart elaborating the summary of trends and patterns of macro- economic environment and institutional quality of BRICS nations (country wise and period wise)

Country Wise ranking as per economic and institutional determinants

	Determinant	Brazil	Russia	India	China	SA
	Y(high=1, low=5)	2	3	4	1	5
Economic Determinants	X1(high=1, low=5)	4	3	2	1	5
	X2(high=1, low=5)	3	4	2	5	1
	X3(high=5, low=1)	5	4	2	1	3
	X4(high=5, low=1)	2	3	4	1	5
	X5(high=1, low=5)	5	1	4	3	2
	X6(high=1, low=5)	4	5	3	1	2
	X7(high=1, low=5)	3	4	2	1	5
	X8(high=1, low=5)	3	2	4	1	5
	X9(high=5, low=1)	3	5	1	2	4
Institutional Determinants	X10(high=1, low=5)	3	5	1	4	2
	X11(high=5, low=1)	2	5	3	4	1
	X12(high=5, low=1)	3	4	5	1	2
	X13(high=5, low=1)	1	4	5	3	2
	X14(high=1, low=5)	3	2	5	1	4
	X15(high=5, low=1)	2	4	5	1	3
	X16(high=1, low=5)	5	3	2	1	4
	X17(high=5, low=1)	2	4	3	1	5
	X18(high=5, low=1)	1	3	5	4	2
	X19(high=1, low=5)	2	3	4	1	5
	Total no. of Rank 1	2	1	2	13	2
	Total no. of Rank 5	3	4	5	1	6

Note: Rank 1 indicates the leader and 5 indicates laggard

Depending on the leader- laggard ratio in terms of macro- economic environment and institutional quality, following is the ranking of countries

1 China	2 Brazil	3 India	4 South Africa	5 Russia

Period Wise performance of BRICS nations as a group

Economic determinants

- Y-FDI inflows increased
- X1-GDP Growth Rate reduced
- X2-IPI increased
- X3-Inflation rates reduced
- X4-Unemployment rates increased
- X5-Trade Openness increased
- X6-REER reduced
- X7-Gross Capital Formation reduced
- X8-International Liquidity increased
- X9-Labour Cost increased

Institutional determinants

- X10-Bureaucracy Quality reduced
- X11-Corruption increased
- X12-Ethnic Tensions almost same
- X13-External Conflict increased
- X14-Government Stability increased
- X15-Internal Conflict increased
- X16-Law and Order mechanism almost same
- X17-Military in Politics reduced
- X18-Religious Tensions reduced
- X19-Socio- economic conditions almost same

7.9 Conclusion

Based on both the secondary data and primary data analysis discussed above, it can be concluded that whatever points of differences exist between intra- BRICS, it can not be inferred that there is no future of BRICS and the differences can not be resurrected. Rather, this shows a lot of opportunities in the future for these five countries to work upon and achieve them through the process of confrontation, negotiation and cooperation. Some of such opportunities lie in:

- Bringing economic reforms in their respective nations that can not only promote their economic development but also give power to their togetherness.
- Increasing innovative abilities with the promotion of continuous integrated technological processes.
- Improvising the economic innovation by imparting training facilities to the talent so that they can become better decision makers and kingpins.
- Protecting intellectual property rights with the most stringent measures in place so that when they invest in other counterparts of this group, their rights are equally protected and they can operate freely.

Opening up of New Development Bank (NDB), also known as BRICS Development Bank, is also one such step in the process of cooperation among the five countries. With such initiatives in future, it is expected that the relationship between these countries will pave the way for more and better opportunities towards persistent economic growth and development.

CHAPTER- 8

CHAPTER: 8- CONCLUSIONS, RECOMMENDATIONS AND FUTURE WORK

8.1 Introduction

The study is an attempt to analyze the impact of FDI inflows on economic growth of BRICS countries. This study has primarily employed Granger's Causality Test, Multiple Regression Analysis, Panel Data Analysis and Trend Analysis to fulfill the different objectives wherein only secondary data has been used (represented by both economic and institutional determinants respectively). The period used for the study covers more than three decades, i.e. 1983-2015 (except for Russia for which only two decades are covered because the data is available from 1995- 2015) to get a comprehensive view about the performance of BRICS on account of both the economic and institutional indicators.

This chapter of the study lists all the conclusions pertaining to each of the objectives of the study. It also highlights the relevance of the study from the view of policy makers of these countries and also globally, MNCs across the world and researchers. It also outlines some recommendations for the government bodies and policy makers of these countries so that they can channelize their efforts in attracting more FDI inflows effectively. The chapter concludes with the limitations of the study and describes the scope of future research in this area.

8.2 Conclusions drawn

8.2.1 Conclusive statements on Objective 1 *(To analyze the causal relationship between FDI and economic growth of Brazil, Russia, India, China and South Africa individually.*)

To analyze the causation between the economic growth (represented by economic and institutional determinants and FDI inflows), pair- wise Granger's Causality test has been applied. This test shows that whether the FDI inflows Granger causes the economic growth (represented by economic and institutional determinants) or vice versa so that the countries can channelize their efforts in the right direction. In other words, the policy makers can make better and more logical policies if they are aware about the direct of causation (i.e. bringing corrective mechanisms for improvising the economic growth in terms of working on the economic and institutional determinants affecting it or making better and open FDI policies).

I. Results of Granger's Causality Test consisting of only economic determinants as regressors

1. Brazil

The results of Granger's Causality test reveal that in case of Brazil, none of the determinants except trade openness attracts FDI inflows, i.e. there is unidirectional causality running from the trade openness to FDI inflows. However, it is to be noted that out of all the five BRICS countries, Brazil stands at the last position in terms of its trade openness (see table 7.1). This means that the measures taken by the Brazilian Government need to be stronger and strengthened in terms of liberalized import export policies that have worked well in fetching more FDI inflows to this nation during this three decades period.

Therefore, it can be concluded that in case of Brazil, ***it is not FDI inflows that impact the economic growth rather it is the opposite, i.e. FDI inflows get impacted by the economic determinants representing economic growth.***

2. Russia

In the Russian context, international liquidity (measured in terms of import cover ratio) has succeeded in influencing FDI inflows, i.e. there is unidirectional causality running from Import Cover Ratio to FDI inflows. Thus, it can be concluded that Russia should have enough foreign exchange reserves to cover its import payments so as to be able to attract more foreign investors to invest in this country in the form of FDI in future too.

In case of Russia also, similar conclusion can be drawn like Brazil, i.e. ***it is not FDI inflows that impact the economic growth rather it is the opposite, i.e. FDI inflows get impacted by the economic determinants representing economic growth.***

3. India

In case of India, unemployment rates are having a great influence in restraining the foreign investors to invest in India (i.e. unidirectional causality running from unemployment rates to FDI inflows). This is also proven by the fact that India is among the top two countries in the BRICS consortium to have high level of unemployment rates

(after South Africa) (see table 7.1) and thus having worsened effect on the inflows of FDI.

Secondly, the good part of FDI inflows coming to India is this that it is able to improvise the position of trade openness in the Indian economy (unidirectional causality running from FDI inflows to trade openness). It signals a better integration of Indian economy with the rest of the world. This situation is improving slowly in India and is clearly visible in improved trade openness in last couple of years (see table 7.3). It is because of the newly elected BJP Government's liberalized policies on FDI and inviting the foreign investors from world over to increase the impetus of economic growth.

Lastly, like Russia, India too has a unidirectional causality running from import cover ratio to FDI inflows. However, India holds second last place in terms of holding greater foreign exchange reserves among the BRICS countries (see table 7.1). Therefore, the Indian Government should work on reducing deficits and accumulate more foreign exchange reserves to be able to meet its increasing import payments or otherwise motivate its exporters as well as domestic producers by providing them incentives or subsidies so that not just the domestic subsistence level is met but also the increased demand for quality products is met within the country itself.

In case of India, it can be concluded that it is both **FDI inflows that impact the economic growth and also vice versa.**

4. China

In China, there are four significant causations which are unique as compared to the previously discussed three countries. Firstly, there is unidirectional causality running from GDP growth rate (an important indicator of economic growth) to FDI inflows in China. It clearly confirms the fact that maximum FDI has flown to China in these last three decades because of largest market size and growth prospects of the Chinese economy (see table 7.1 and 7.3).

Secondly, REER also contributes towards attracting more FDI inflows in China. Thirdly, Granger's Causality test reveals that gross capital formation rate in the Chinese economy is also a crucial factor in influencing the FDI inflows. Both these causalities are also making sense because China is the leading country among all the other countries in

the BRICS consortium in terms of REER and Gross Capital Formation annual growth rate (see table 7.1).

Last fact to be noticed in the context of China is the unidirectional causality running from FDI inflows to inflation rates. It implies that with the rising FDI inflows in China, inflation rates are also increasing at a fast pace.

In case of China also, like India, it can be concluded that it is both **FDI inflows that impact the economic growth and also vice versa.**

5. South Africa

Like India, in the case of South Africa, it can be observed that there is unidirectional causality running from unemployment rates to FDI inflows. This is also proven by the fact that South Africa is at the top in the BRICS consortium to have highest level of unemployment rates (see table 7.1) and thus affecting its level of FDI inflows.

Another crucial factor for influencing FDI inflows, proven by many researchers in the past, is trade openness which is significantly affecting and getting affected by the FDI inflows as per Granger causality test in the context of South Africa (bidirectional causality flowing from trade openness to FDI inflows and vice versa).

Lastly, it is proven by the Granger Causality test that FDI inflows coming into South Africa have a great impact on the REER i.e. there is unidirectional causality running from FDI inflows to REER.

In case of South Africa too, like India and China, it can be concluded that it is both **FDI inflows that impact the economic growth and also vice versa.**

II. Results of Granger's Causality Test consisting of only institutional determinants as regressors

Granger's Causality test reveals that there is no unidirectional/ bidirectional causality between the FDI inflows and institutional determinants in the context of any of BRICS countries individually.

It should be noted here that the Granger Causality Test only provides inference as to the direction of causality and not about the positive/ negative change and the magnitude of effect of independent determinants on the dependent variable. Therefore, to delve deeper into this issue, the present study also conducts a multiple regression analysis

consisting of FDI inflows as dependent variable and both economic and institutional determinants as independent determinants of each of these five countries.

8.2.2 Conclusive statements on Objective 2 ***(****To ascertain significant determinants (both economic and institutional) of FDI inflows in Brazil, Russia, India, China and South Africa individually.*****)**

I. Results of Multiple Regression model consisting of only economic determinants as regressors

1. Brazil

It can be seen that in case of Brazil, FDI inflows gets impacted by various independent determinants that are significant at various levels. Variable X3, inflation rates, negatively affects the FDI inflows i.e. a one percent change in inflation rates leads to downfall in FDI inflows in Brazil by 0.01%.

Another significant factor is variable X5, trade openness, which has a positive influence on FDI inflows coming into Brazil. A one percent change in trade openness i.e. ratio of export plus import vis-à-vis GDP of the country, leads to a 93.81% change in FDI inflows.

On the similar lines, variable X6 is also extremely useful in explaining the change in FDI inflows (one percent change in REER leads to 75.62% increase in FDI inflows) in Brazil. This is simply because of increase in expectations of future profitability in terms of the home currency.

Better financial health of a country which is indicated by variable X8 i.e. international liquidity also induces FDI inflows in Brazil by 19.82%.

However, as expected, a negative and significant relationship can be seen between variable X9 (labour cost) and FDI inflows. Almost 19.69% change in FDI inflows is accounted for with one percent change in labour cost in Brazil.

The model of Brazil also consists of lag determinants of all the dependent and independent determinants so as to remove the problem of serial correlation from the model. Out of all the lagged determinants, LagX5 (one year past values of trade openness) and LagX7 (one year past values of gross capital formation) also impact the FDI inflows negatively (-113.19%) and positively (1.03%) respectively.

2. Russia

In case of Russia, only determinants X2 (Industrial Production Index) and X9 (labour cost) appear to be the most significant determinants of FDI inflows. Variable X2 though is expected to positively influence the level of FDI inflows in the country is not true in the case of Russia. A negative but significant coefficient value of variable X2 implies that a one percent increase in IPI levels will lead to a 0.72% decrease in FDI inflows in Russia. This might be because an increase in real production output of manufacturing, mining and utilities sector is just sufficient in contributing only to domestic sustenance and not letting the foreign players getting the advantage of such increase, thereby reducing them to enter into Russian market.

On the other hand variable X9 (labour cost) is negatively impacting, as expected, the FDI inflows. This means that one percent increase in labour cost in Russia will lead to 3.48% decrease in the level of FDI inflows coming into the country.

3. India

In the regression model of India, it can be seen that determinants X1, X6, X7 and X8 are significantly impacting the dependent variable FDI inflows. Variable X1 (GDP growth rates) has a negative sign of coefficient which implies that even when there is a one percent increase in the GDP growth rates in India, FDI inflows tend to become lesser by 1.10%. Theoretically and as per the available literature, increased level of market size and growth prospects leads to more FDI inflows. However, as per the findings in this model, it can be inferred that probably the restrictive FDI policies of the Indian Govt. are a major reason for restraining the foreign players to enter into the Indian market and operate freely. However, it is also to be noted here that this is an average result with respect to past three decades but with the newly elected BJP Govt., more liberalized trade policies and campaigns like Make in India launched by the Govt., more and more foreign participants are motivated to invest in India. This is also reflected in the increased levels of FDI inflows in the past three years i.e. since 2014 till date (BJP came into power on 26-05-2014). The highest levels of FDI inflows are achieved by India in year 2015 only, i.e. 44.21 billion USD.

Another significant variable impacting the FDI inflows in India is Variable X6, REER. Negative coefficient of REER signifies that an appreciation of Indian Rupee acts

as a deterrent for the foreign investors to invest in India. One percent increase in the value of Indian Rupee will lead to a 12.31% decline in the FDI inflows. This is simply because the foreign investors find it unprofitable to remit their earnings in their home country while the value of host currency has appreciated.

Variable X7 (Gross Capital Formation) has a positive (coefficient value of 0.0132) and significant impact on the FDI inflows coming into India. It implies that a better investment climate in India leads to a 0.01% increase in FDI inflows.

An explanation of another significant regressor (Variable X8, International Liquidity) is noteworthy here. Due to continuous deficits in the Balance of Payment, the Indian economy is running out of its foreign exchange reserves to meet the increasing demand and making import payments. This has led to a negative impact on the mindset of foreign players making investments in India. This is evident from a negative coefficient value of variable X8 (-2.2186). It is also important to highlight here that India stands at the second last position (next is South Africa) in terms of covering its import payments from the foreign exchange reserves among the BRICS countries.

4. China

The OLS Model for China shows that Variable X3 (inflation rates) plays a significant role in inviting foreign investors to invest in their country via FDI. A one percent change in inflation in China leads to 0.02% increase in FDI inflows. This may happen because the market shows better demand prospects and a higher purchasing power in the hands of maximum part of population leading to greater producer surplus which acts as an incentive for the foreign investors.

Trade openness (Variable X5) is also found to significant determinant affecting FDI inflows in China. A one percent change in trade openness ratio leads to 0.93% increase in FDI inflows.

In China, Variable X6 (REER) is also significant factor for inducing FDI inflows. A positive coefficient of REER indicates that a one percent change in REER will lead to a 1.97% increase in FDI inflows because of increase in expectations of future profitability in terms of the home currency.

Lastly, variable X8 (international liquidity) is also positively impacting the FDI inflows in the Chinese economy. It is having a positive and coefficient value implying the

country has an excellent financial health in terms of very high foreign exchange reserves to meet its import payments and thus signaling the foreign investors to invest in their country. A one percent increase in the import cover ratio of the country leads to 0.45% increase in FDI inflows.

5. South Africa

In case of this country, only the lagged values of dependent variable, Y, FDI inflows of past three lags are found to be significant determinant in affecting FDI inflows. It may be because more foreign investors plan to invest in this country by looking at the past trends of investment and profitable avenues available in the country. As such none of the other nine economic determinants are significantly impacting the FDI inflows in South Africa. It is to be noted that variable X5 (trade openness) is having the highest and positive coefficient value impacting the FDI inflows, however the value is not found to be significant.

II. Results of Multiple Regression model consisting of only institutional determinants as regressors

1. Brazil

It can be seen in the above table that variable X11 has negatively influenced the FDI inflows. As per the ICRG methodology issued by the PRS Group from where the data on country risk ratings has been taken; the higher the risk ratings, the lower the risk a particular country has and vice versa. Because of a lower rating on corruption levels during these three decades period of the study, FDI inflows have decreased in Brazil by 5.13%.

As per the results, another significant institutional factor impacting the FDI inflows positively in Brazil is variable X14 (government stability). It has contributed to 4.35% increase in the FDI inflows into the country.

2. Russia

It can be concluded from the above analysis that although none of the independent determinants (X10- X19) are significant in inducing FDI inflows individually in Russia, still a significant F- statistic (2.72 significant at 10% level of significance) shows that all of them jointly are able to explain he variation in FDI inflows. An R-squared of 47.98%

with an adjusted R- squared of 16.77% explains that all the ten institutional determinants (though insignificant) able to explain 16.77% variation in FDI inflows.

3. India

A positive and significant intercept of the model explains that even if in case all the independent determinants remain constant or not present in the model, still FDI is ought to flow in India and increase by 34.26%. This is a good signal to showcase how a positive environment and strong fundamentals lead to motivate foreign investors to operate freely in a country.

An important significant variable for India is X11 (corruption). On an average, an improvised rating in terms of high risk points (lower corruption levels) has motivated the foreign investors to make fresh investments in India by an increase in FDI inflows by 7.49%.

An obvious significant factor which acts as a deterrent to the FDI inflows coming to India is variable X14 (government stability). A common scenario in India is the conflict from the opposition which disrupts the operations of the present government (like frequent changes in policies) creating an unstable environment for not just the domestic companies but also for the foreign counterparts. This has led to fall in FDI inflows by 3.23%.

Another worldwide known significant factor affecting the internal environment of the Indian economy is variable X15 (internal conflict) which includes terrorism within the country that acts as a major hurdle for the foreign investors to stay invested in India. This reason has resulted in decline of FDI inflows by 4.29%.

Variable X17 (military in politics) also shows a significantly positive (coefficient value of 7.1735) influence on FDI inflows. India has a least risk of control of military over the system and therefore it acts as a positive signal for the MNCs to put their money into India.

On the contrary variable X19 (socio economic conditions) is worsening the situation of FDI inflows flowing to the country (low risk points indicating higher risk). It is because of the poor performance of the country in the past three decades in terms of poverty alleviation, employment generation, equality of income etc. which negatively affects not just the confidence of consumers but also the domestic as well as foreign

producers. This factor has a negative coefficient value of -4.4573 meaning thereby a decline of FDI inflows by 4.46%.

4. China

The first and foremost significant factor affecting the FDI inflows in China is variable X12 (ethnic tensions). Because of least inherent tensions (expressed by high ratings) existing in the Chinese economy in terms of racial discrimination, nationality or language differences, FDI inflows have increased by 40.63%.

Another significant determinant for higher FDI inflows in China is variable X14 (government stability). Although there is stability with the one-party system that leads to higher ratings for political stability (evident from an increase in FDI inflows by 17.55%), still there is also very little transparency in rules and other aspects of doing business, which make it challenging for foreign investors.

Variable X15 (internal conflict) is another significant variable negatively influencing the FDI inflows coming to India. A lower rating of China on this parameter indicates a greater risk of civil disorder or high risk of terrorism within the country which has led to a decline in FDI by 18.44%.

The ratings of China have also reduced on account of improper law and order mechanism (X16) in terms of partial judicial system or rising crime rate within the country leading to a decline in FDI inflows by 21.65%.

On the contrary, the Chinese economy is the one the fastest growing economies of the world which is eradicating its root level problems within the economy, like poverty, unemployment, inequality of income, etc., boosting the ratings of socio- economic conditions existing in the country. That is the reason for a positive and significant impact of variable X19 (socio- economic conditions) on the FDI inflows (increased by 10.08%).

5. South Africa

Though the intercept of the model is significant in influencing the FDI inflows coming to South Africa, however unlike India, it impacts the dependent variable negatively (coefficient value of -47.20). This precisely means that if all the institutional determinants are to be held as constant, then there would have been more of outflows of FDI rather than making more investments in South Africa. It may be because of the overall perception in the minds of foreign investors who presume it to be still in the

nascent stage of growth and has not much to offer to the foreign investors in terms of skills, infrastructure etc.

But, this is to be noted here that merely perception doesn't work in real world scenario and there are practically various factors which are contributing towards the FDI inflows growing in South Africa as shown by the model under this study. There are two such factors identified by the OLS Model with robust standard errors in this case.

One of them is variable X15 (internal conflict) which is positively contributing to FDI inflows coming into the country (an increase of FDI inflows by 2.47% is clearly indicated due to this reason). Higher ratings on this account indicate a better position of the country in terms of lower risks of civil disorder or terrorism within the country, motivating the foreign players to make fresh investments.

Another crucial determinant of FDI inflows proven by this model is X17 (military in politics) having a positive coefficient value of 4.30. This means that there is least risk of any military takeover in South Africa (displayed by higher ratings getting improvised over the past two decades) which has led to an increase of FDI inflows by 4.30%.

Thus, it can be concluded that both the models (economic and institutional) are models of best fit and doing justification in explaining the variations in FDI inflows in Brazil, Russia, India, China and South Africa individually.

8.2.3 Conclusive statements on Objective 3 (*To estimate the most significant determinants impacting the FDI inflows in BRICS nations as a group.***)**

I. Results of Panel Data Analysis consisting of only economic determinants as regressors

The empirical results of the RE model (with robust option) reveal that X1 (market size and growth prospects for which GDP growth rates are used as proxy) are statistically significant determinant impacting the FDI inflows at 1% significance level. Coefficient value of X1 (1.185) represents both the within- country and between- country effects, i.e. the average effect of GDP growth rate over FDI inflows when it changes across time and between countries by one unit. It simply means that a larger market size of BRICS countries provides more opportunities for sales and also profits to foreign firms, and therefore attracts greater FDI inflows (results confirm with Severiano, 2011; Singhania and Gupta, 2011; Dhingra and Sidhu, 2011).

Results show that inflation rates (X3) showing a negative sign of coefficient is significant determinant in influencing FDI inflows in BRICS at 5% level of significance (results confirm with Gupta and Singh, 2014; Singhania and Gupta, 2011; Nonnemberg and Mendonca, 2004). It implies that as the inflation rates increase in these emerging economies, the resultant effect on FDI inflows is negative as the MNCs might not like to enter in such a market where their cost of production would increase. This might cut down their margins and thus acts as a de-motivating factor for them while analyzing the alternative of making long term investment into BRICS countries.

Trade openness (X5) is also acting as a major factor (largest coefficient value of 55.59899 and statistically significant at 5% level of significance) in attracting more FDI inflows into BRICS. In simple words, one per cent change in the trade openness in BRICS lead to 55.60% per cent change in FDI inflows. A positive coefficient of trade openness, as expected, shows that all the BRICS countries are following a liberal trade regime and are thus able to successfully attract increasing FDI inflows (results confirm with Seetanah and Rojid, 2011; Severiano, 2011; Nonnemberg and Mendonca, 2004).

The results also reveal a positive sign of coefficient and a statistically significant value of Real Effective Exchange Rate (X6) (coefficient value of 49.367 and p-value lesser than 0.05) implying that there is a direct and very strong relationship between FDI inflows and exchange rate movements in the host country. In other words, one per cent change in the exchange rate leads to 49.36% change in the value of FDI inflows in BRICS countries. It implies that due to appreciation of the host currencies of BRICS, FDI inflows have increased into these countries in expectations of future profitability in terms of the home currency at the time of repatriation of profits (results are in conformity with Severiano, 2011; Maniam and Chatterjee, 1998).

Another important factor which is found to be significant as per the RE model is gross capital formation (X7) which is statistically significant at 5% level of significance. However the negative sign of coefficient implies that the ownership changes brought by FDI made by the MNEs in the host country do not affect gross capital formation of BRICS countries and it also means the vice versa i.e. the cut throat competition among the developing countries do not lead to attracting more FDI inflows in a single country

because each country brings newer strategies to compete with each other (see the results derived by Vijayakumar et al., 2010).

Besides, the results also show that other determinants such as unemployment rate and labor cost negatively impact and the level of international liquidity measured in terms of import cover ratio positively influence the FDI inflows in BRICS countries though they are not proven to be statistically significant determinants. Finally, it can be asserted from the findings that all the determinants are behaving in the same direction as expected in other developing countries of the world and are extremely useful in attracting FDI inflows in BRICS.

The between R^2 is "How much of the variance between separate panel units i.e. five countries in the present case does this model account for" which in this case means that only 18% variance between these five countries is jointly explained by all these determinants in this model. The within R^2 is "How much of the variance within the panel units does this model account for", i.e. 71.56% variance within each country in this case is explained with the help of RE Model which is the model of best fit and the R^2 overall is a weighted average of these two, i.e. 19.46% variation in totality between the countries and within each country together is explained by this model.

The findings are well supported by the theories that exist in the international business environment which determines the movement of FDI flows to a specific country.

II. Results of Panel Data Analysis consisting of only institutional determinants as regressors

The empirical results of the RE model (with robust option) presented in Table 6.15 reveal that X13 (ratings for the threat of external conflict to a country) and X16 (ratings for the law and order situation in the country) are statistically significant determinants impacting the FDI inflows at 5% significance level. Also, the sign of coefficients of both these determinants is positive, symbolizing that higher the ratings for these two determinants for the country, lesser these countries are prone to such risks which in turn implies better investment environment for the foreign investors in BRICS countries. It can also be inferred from the above analysis of RE model with robust option

that all these institutional determinants (except variable X18, i.e. religious tensions) are able to explain almost 24.40% variation in the FDI inflows.

8.2.4 Conclusive statements on Objective 4 ***(****To examine the trends and patterns of macro- economic environment and institutional quality, challenges and prospects of BRICS nations.****)***

1. Analysis of individual countries

I. Economic determinants

An overview of the macroeconomic environment of each of the BRICS countries in terms of economic determinants for three decades long period (except for Russia, 21 years period), is summarized as follows on an average basis:

- China has attracted the maximum FDI inflows followed by Brazil, Russia, India and South Africa.
- China has been leading in terms of largest market size and growth prospects as well. Its GDP growth rates are the highest among the other four countries which follow its path in this order: India, Russia, Brazil and South Africa.
- South Africa has the highest pace in terms of real production output in manufacturing, mining and utilities sector measured by the Industrial Production Index followed by India, Brazil, Russia and China.
- Brazil has been suffering from high inflation rates for long. Its average is the highest followed by Russia, South Africa, India and China.
- In terms of unemployment rates, South Africa stands at the top followed by India, Russia, Brazil and China.
- Trade openness, a measure of an economy's integration with the world economy, is highest in Russia followed by South Africa, China, India and Brazil.
- Real effective exchange rate is highest for Chinese Yuan followed by South African Rand, Indian Rupee, Brazilian Real and Russian Ruble.
- China has the highest gross capital formation growth rate during this period followed by India, Brazil, Russia and South Africa.
- China again is at the apex in terms of international liquidity by having maximum foreign exchange reserves to cover its import payments followed by Russia, Brazil, India and South Africa.

- Labour cost which is measured in terms of workers' remittances is highest in India followed by China, Brazil, South Africa and Russia. It is to be noted that both South Africa and Russia rather have a negative workers' remittances on an average during this period.

II. Institutional Determinants

In terms of institutional determinants, following observations can be made for each of the BRICS countries:

- India has the highest rating on bureaucracy quality followed by South Africa, Brazil, China and Russia. This means that India is the most stable country among the group to have policy measures relatively untouched when its government changes.
- In terms of corruption, South Africa gets the maximum ratings on an average followed by Brazil, India, China and Russia. It means that South Africa is the least corrupt country among the BRICS countries.
- China stands at the top in terms of highest ratings on the threat of ethnic tensions within the economy i.e. at the lowest risk followed by South Africa, Brazil, Russia and India. India as a country of cultural diversities and various languages stands at the highest risk of ethnic tensions among the BRICS.
- The threat of external conflict is almost negligible in Brazil which has the maximum ratings near to the maximum score followed by South Africa, China, Russia and India. India since has the lowest ratings among BRICS is prone to foreign pressures on trade restrictions, threat of war etc.
- Chinese government seems to be the most stable among the BRICS as China has got the maximum ratings in government stability. It is followed by Russia, Brazil, South Africa and India. India in this case also stands at the last because of more than one political party fighting to get on the power, thus leading to large scams, red tapism, etc. at the root level.
- China has the least risk of any internal conflict within the economy in terms of any civil disorder or terrorism within the country. It is followed by Brazil, South Africa, Russia and India. India again has the lowest ratings among BRICS in this case meaning thereby that the risk of civil violence or terrorism is inherent in the Indian economy.

- China in the case of law and order mechanisms also comes at the first level among the BRICS followed by India, Russia, South Africa and Brazil. It signifies that the strength and impartiality of legal system in China is much better than the other counterparts in the consortium.
- South Africa has the highest ratings on the risk of involvement of military in politics. It is followed by Russia, India, Brazil and China. As per these ratings, China has the highest risk of military take over.
- In terms of religious tensions, Brazil stands at the top having the maximum ratings indicating no such threat at all. It is followed by South Africa, Russia, China and India. These ratings indicate that India has the highest risk of one religious group dominating the governance of the whole country.
- This is the most crucial factor in terms of institutional factors as this encompasses the basic problems at the root level in most of the developing nations. This includes poverty, unemployment, inequality of income, confidence of consumer in the market which affects the individuals of the economy and the society at large. China has the highest ratings in socio- economic conditions indicating the goodness of the overall macro- economic environment. It is followed by Brazil, Russia, India and South Africa.

  The above results indicate that China has been the most preferred destination for the foreign investors because of the above mentioned economic and institutional factors followed by Brazil, Russia, India and South Africa.

2. Analysis of BRICS performance over the period: It is done to assess the trend of macro- economic determinants over the period 1983- 2015 (except Russia for which period is considered from 1995-2015) and of institutional determinants over the period 1995-2015 for BRICS countries as a group.

I. Economic Determinants

- FDI inflows has increased from 0.58 billion USD in 1983 to 75.44 billion USD in 2015 on an average, which is almost 130 times in three decades.
- In terms of GDP growth rates, BRICS have not performed well, it has deteriorated from an average of 3.20% to 1.64%. It is majorly because of low or negative growth rates of Brazil and Russia over this time period.

- The real output measured in terms of Industrial Production Index has gone three times high as compared to the position in 1983, i.e. the average value in 1983 was 40.22 which has increased to 124.85 in 2015.
- The situation of inflation rates has improved significantly, i.e. from a high 135.03% it has dropped down to an average 7.29% in 2015.
- Unemployment rates on an average have been more and less same with a minor increase from year 1983 (8.77%) to 9.81% in year 2015.
- Trade openness also has remained almost the same over these years with a small addition on an average from year 1983 (0.235%) to 0.45% in 2015.
- A fall in the Real Effective Exchange Rate on an average can be seen from the year 1983 (155.30) to 107.00 in the year 2015 meaning thereby that the exports would have gone high as the domestic goods become more competitive.
- BRICS performance in annual percentage growth rates of gross capital formation has deteriorated even further as compared to 1983. On an average BRICS had -0.85% gross capital formation growth rate which has fallen down to -5.23% in 2015.
- International liquidity has gone two times high in 2015 as compared to 1983, i.e. the import cover ratio has improved from an average of 6.50 months to 13.33 months.
- In terms of labor cost, net workers' remittances have increased almost 29 times during this period. From an average of 0.54 million USD, it has increased to 15.76 million USD.

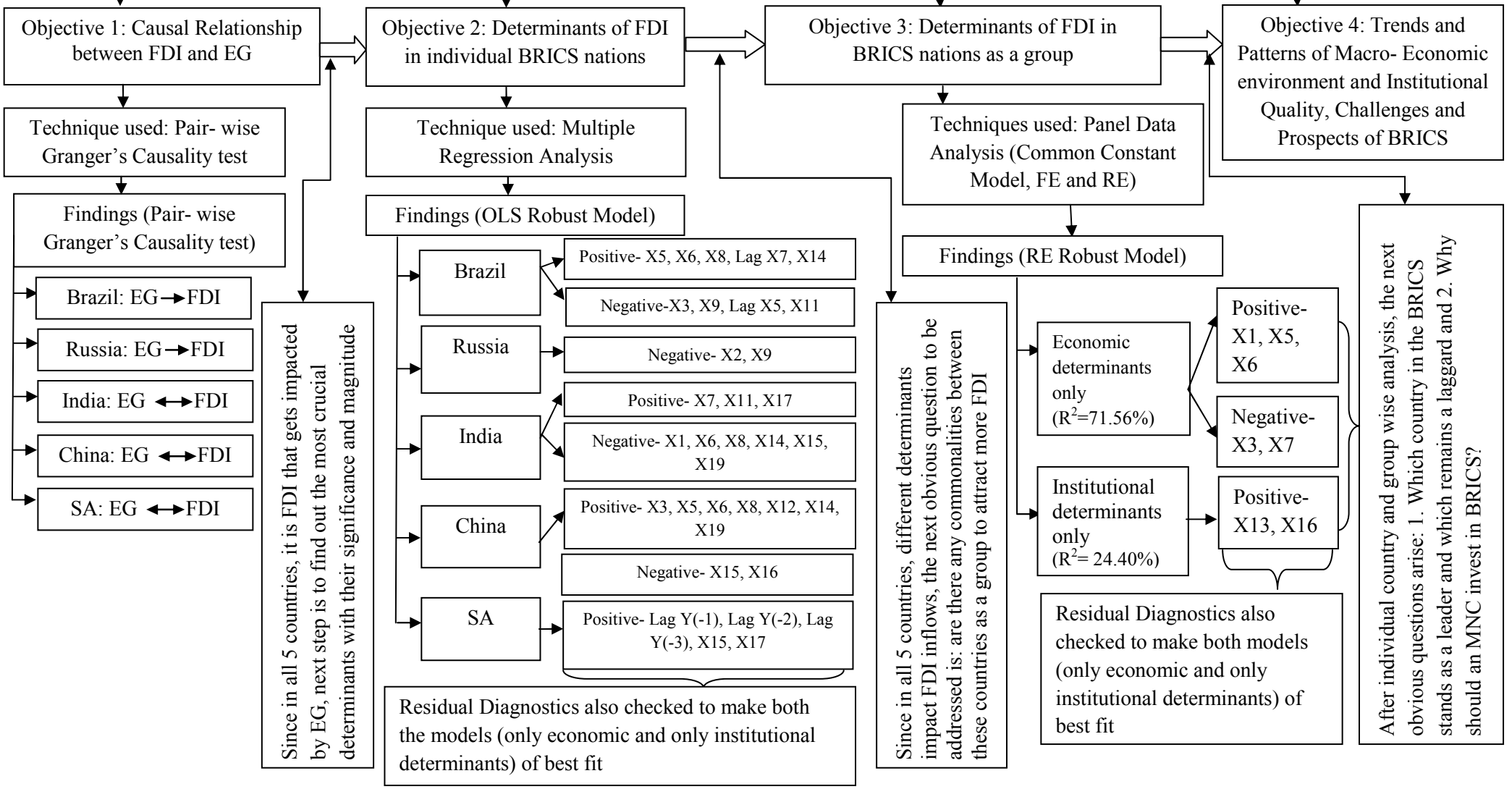
II. Institutional Determinants

- In terms of bureaucracy quality, corruption, external conflict and internal conflict the performance of BRICS has diminished.
- In terms of ethnic tensions, law and order mechanism, and socio- economic conditions the situation is almost the same with a slight fall in the average ratings.
- The situation of BRICS as a group has improved significantly in terms of government stability, military in politics and religious tensions.

The above analysis shows that each of these five countries has varied strengths and capabilities because of which some of them are leaders in some areas whereas some others are laggards in those areas.

A brief summary of all the objectives, their findings and the conclusions drawn from them is presented in the form of a connectivity flow diagram below (Figure 8.1). This figure also shows a logical step wise process followed by the study to arrive at the overall conclusion in the context of BRICS countries.

Figure 8.1: Flowchart explaining the connection between the objectives and findings of the study



8.3 Implications of the study

8.3.1 Theoretical implications of the study:

1. The present study differs from the earlier studies in many ways and enriches the existing literature by including qualitative determinants not studied earlier by other researchers in the context of emerging economies, e.g. country risk ratings of BRICS would be analyzed for assessing their institutional quality.
2. This study is significant because there is hardly any study on BRICS nations which has taken both quantitative (represented by economic determinants) and qualitative (represented by institutional determinants, i.e. country risk ratings) determinants together for measuring economic growth and then assessing the causal relationship between economic growth and FDI inflows.
3. The studies conducted by UNCTAD, IMF and other multilateral agencies show that BRICS have emerged as major recipients of FDI over the past decade. FDI inflows to BRICS more than tripled to an estimated US$ 263 billion in 2012. As a result, their share in world FDI flows kept rising even during the crisis, reaching 20% in 2012, up from 6% in 2000. (UNCTAD Global Investment Trends Monitor (2013)). So, an important question addressed by the study is that why these economies are showing this character and also will the growth trajectory persist like this even in future.
4. This study also has an important theoretical contribution for the researchers who might take this study further and use the proposed models of FDI to test the relationship between FDI inflows and economic growth of other emerging economies which are following the same path like BRICS such as PIN (Pakistan, Indonesia, Nigeria), MINT (Mexico, Indonesia, Nigeria, Turkey) etc.

8.3.2 Managerial implications of the study:

1. This study enhances knowledge of the determinants of FDI in BRICS countries. Firms from BRICS and other emerging markets may better understand the factors that influence their internationalization process (both economic and institutional).
2. The study is significant not just for the researchers but also for the policy makers of the BRICS so as to understand in which areas their country is leading or lagging and

also for the policy makers of other emerging countries of the world to take lessons from BRICS and follow their path of success.

3. This study helps the governments of other group of emerging countries such as PIN (Pakistan, Indonesia, and Nigeria); MINT (Mexico, Indonesia, Nigeria and Turkey); CIVETS (Colombia, Indonesia, Vietnam, Egypt, Turkey and South Africa); Next Eleven (Bangladesh, Egypt, Indonesia, Iran, Mexico, Nigeria, Pakistan, Philippines, Turkey, South Korea and Vietnam) which can follow the path of BRICS economies in growth and formulate policies to attract FDI accordingly.
4. At the enterprise level, it helps MNCs in understanding BRICS markets and formulating entry and growth strategies in these most emerging countries of the world.

8.4 Recommendations of the study

After the detailed analysis about the results derived by the causality test and the regression models (chapter 4-6) and the analysis of strengths and weaknesses of the BRICS countries (chapter 7), it can be concluded that for several reasons, BRICS have acquired a key role in the world economy. Their large population (more than 40 per cent of world population), big size middle class, huge share of land (nearly 30 per cent of global share), work force availability and natural resources could be some of those reasons. These countries have also shown their robust macro- economic fundamentals by their speedy recovery from the global economic crisis. Still, there are several challenges in front of these economies for which this study suggest certain recommendations to the policy makers of these countries so that they can be addressed in a timely manner helping the BRICS to become super powers of the world in near future. The recommendations are given from two perspectives, firstly from the perspective of the results derived from the study and secondly, from the general perspective taking into consideration the current scenario of these economies and BRICS as a whole.

8.4.1 Recommendations for the Government of Brazil

(A) From the perspective of results derived in this study:

i. Trade openness has Granger caused increase in FDI inflows (one percent change in trade openness has increased FDI inflows by 93.81% which is enormous growth) during the last three decades. Yet, Brazil stands at the last position in terms of

average trade openness (0.22%) as compared to other countries in the group. Therefore, it is recommended to the government of Brazil to bring more economic reforms to liberalize its trade policies further and increase the basket of tradable in the country to get more integrated with the world economy.

ii. Inflation rates in Brazil negatively affect the FDI inflows (a decline of 0.01% can be seen). Though the magnitude of impact is quite minimal yet it is significant enough to make a visible change. Brazil also has a record high average inflation rate (349.36%) as compared to other counterparts in the group. Though it was able to manage the figures of inflation rate in one digit for almost 9 years (2004- 2012), however, an increasing trend has again started post this period and in 2015, it almost touched the 10% figure. Therefore, it is recommended to the Brazilian Government to take proper monetary policy measures via The Central Bank of Brazil to control the money supply in the hands of the public to control inflation.

iii. Labour cost, represented by net workers' remittances, in Brazil has gone up by almost 155 times since 1983. Among BRICS, it stands at third place in average labour cost. Because of these reasons, the foreign investors might find it costly to produce or operate in Brazil leading to a decline in FDI inflows by 19.69%. Therefore, it is recommended to the policy makers to frame such policies to keep a check on the demand of labour unions and make reasonable compensation policies for the workers and to provide incentives to them with the increasing business.

iv. Corruption levels in Brazil are higher and are negatively impacting the FDI inflows. It stands at second position among the BRICS in terms of low ratings on corruption. Though the Brazilian Government is already taking steps in this direction, more stringent measures are the need of the hour. Some of such measures could be enforcement of anti- corruption laws, framing policies against bribery, expanding access to information of the acts of public administration to ensure transparency, among many others.

(B) From the general perspective based on current scenario:

v. Its tradable sector is quite small in comparison to other countries in the group like China, so it should include more goods and services to increase its size.

vi. The saving and investment rates need to be brought at par with other BRICS economies like China and India which can be done only by bringing the population at large at par that can be achieved only by solving the problem of inequality of income.

vii. Need to improvise public sector management.

viii. The financial sector and its services should be broadened and deepened.

ix. Funding facilities at the disposal of the private sector are limited which need to be improved.

8.4.2 Recommendations for the Government of Russia

(A) From the perspective of results derived in this study

i. Industrial Production Index negatively impacts the FDI inflows, though the magnitude of its effect is very minimal (only 0.72%). Oil prices have remained considerably below levels in 2009-14, depriving the economy of a key source of revenue. Moreover, without structural reforms and greater efforts to diversify the economy away from its dependence on oil, potential growth will remain constrained. Therefore, the Russian Government should frame policies to motivate the domestic producers to diversify their over reliance on oil products. The government should also search for some alternative sources of finance to meet its investment needs since off late; the Russian Government has started getting sanctions from China which is also projected to get investment standstill with slower growth in times to come.

ii. Labour cost in Russia is negatively influencing the FDI inflows. It is because for all the past 21 years (except for the year 2000 and 2001), it has been negative (which means remittances paid to workers were higher than the remittances received by the country), which means the Russian workers are costly to hire and work with. It is also indicated by the fact that the net workers' remittances have increased by almost 8 times than in 1995. Therefore, it is recommended to the Russian Government to lower the wages paid per hour or increase the output per worker so that lower labour costs may provide sufficient impetus for investors to increase cross-border production.

(B) From the general perspective based on current scenario:

iii. Structural reforms need to be implemented at a faster pace particularly in an efficient and undercapitalized sector like oil where still monopolies exist.

iv. Investment climate in terms of socio- economic conditions needs to be improvised. While the Russian Government has been working on various monetary and fiscal measures to combat the current crisis, such as lowering the central bank's policy rate, letting the Russian Rouble float, loosening the fiscal rule, and investing in large projects (by drawing down the National Welfare Fund). Still, these policies may fall short of the kind of measures needed to prevent the economy from stagnating in the face of permanently lower oil prices and reduced foreign flows in the wake of sanctions from countries like China.

8.4.3 Recommendations for the Government of India

(A) From the perspective of results derived in this study:

i. Results show that with one percent increase in the GDP growth rates in India, FDI inflows tend to become lesser by 1.10%. It can be inferred that probably the restrictive FDI policies of the Indian Government are a major reason for restraining the foreign players to enter into the Indian market and operate freely. Therefore, it is recommended to the present Government to bring more liberalized trade policies and campaigns like 'Make in India' so that more and more foreign participants are motivated to invest in India. The effect of such policy changes has started reflecting in the increased levels of FDI inflows in the past three years i.e. since 2014 till date. The highest levels of FDI inflows are achieved by India in year 2015 only, i.e. 44.21 billion USD.

ii. Another factor which is negatively impacting the FDI inflows is international liquidity measured by the import cover ratio (thought the decline is just 2%, it should be controlled before it gets even worse). This is due to continuous current account deficits that the Indian economy is running out of its foreign exchange reserves to meet the increasing demand and making import payments. This has led to a negative impact on the mindset of foreign players making investments in India.
It is to be noted that India stands at fourth place among BRICS in terms of this factor. It had an international liquidity ratio of 6 months in 1983 which has reached

to 9 months by 2015, which is merely an increase of 3 months in three decades. Therefore, it is recommended to the Government of India to increase its foreign exchange reserves by bringing the black money back to the country and by initiating economic reforms. However, if the government does not deliver on its promises, businesses and investors shall begin to lose faith. This would increase India's exposure to capital outflows. The situation may get worsened if there is an adverse external event, such as a disorderly market reaction to changing US economic policies.

iii. Another crucial factor is unemployment rate which Granger causes FDI inflows in India. India is at the second position among BRICS in terms of highest average unemployment rates during the period under study. Therefore, it is recommended to the policy makers to allocate more funds in the budget to infuse capital in the hands of consumer goods industries where more number of labour can be employed. The Government should launch more schemes for the promotion of SME (Small and Medium Enterprises) sector in India. The government may also plan to develop small industrial complexes in smaller towns so as to provide more employment opportunities. Project like developing smart cities in the country is one such initiative taken by the present government.

   Additionally the government may also provide subsidies to those industries which provide more employment opportunities. This will encourage not just their production levels but also incentivize them with higher subsidies. Changes can be made in the education system for imparting more of vocational degrees to increase the employability rather than focusing merely on professional degrees.

iv. As proven by this study, Government stability acts as a deterrent in attracting FDI inflows to India (fall by 3.23%). However, it is to be noted that these results are based on the past thirty years. After the gap of thirty years, India now has got a Central Government with the full majority in the year 2014, which seems promising in bringing structural reforms and does the welfare of the society at large. Therefore, a positive impact may be expected on FDI inflows shortly.

v. The results of this study show that India has a huge risk of internal conflicts within the country which are adversely affecting the FDI inflows (decrease by 4.29%).

Therefore, it is recommended to the Government of India to make stricter laws for fighting against terrorism and punishing those who are found guilty.

vi. Negative impact of socio- economic conditions on FDI inflows (decline of 4.46%) can also be seen. For this, the Government should bring structural reforms and alienate from the problem of poverty alleviation, employment generation, equality of income etc.

(B) From the general perspective based on current scenario:

vii. While maintaining its service-led growth model, India should also diversify its growth model for manufacturing.

viii. The government should allocate more capital in the budget for the implementation of programs for improving physical infrastructure.

ix. The agriculture sector is to be equipped with all the latest developments for which technological innovations should be made accessible to agriculturists easily.

x. The Government should make provisions to render essential public services such as education and health to maximum parts of the population for the overall economic development of the nation.

8.4.4 Recommendations for the Government of China

(A) From the perspective of results derived in this study:

Though being one of the top most destinations in the world and also among BRICS (it has highest FDI inflows, highest GDP growth rates, highest gross capital formation, and highest international liquidity, low compensation of workers, least risk of ethnic tensions, internal conflicts, most stable government, a proper law and order mechanism in place and an overall congenial working environment measured by socio- economic conditions), China has all the advantages to relish the success over the next few years too. However, to compete with its counterparts, following recommendations are made to the Chinese Government:

i. Though government stability acts a positive factor behind increased levels of FDI inflows (increase by 17.55%), still it is recommended to the government of China to make its rules, policies and procedures more accessible to the public at large. If such transparency is ensured at all levels, it will act as positive signal for the foreign investors also to operate freely in China.

ii. Though the risk of internal conflict is least in China among the BRICS, it has adversely affected the FDI inflows. Therefore, the government of China should take proper measures against any kind of civil order or terrorism activities within the country.

iii. Improper law and order mechanism within the country in terms of partial judicial system or rising crime rate has led to decline in FDI inflows. Therefore, to protect the rights of investors, Government should take proactive steps to avoid any such situation.

(B) From the general perspective based on current scenario:

iv. Financial sector reforms are needed to improve the intermediation of China's large private savings.

v. The government needs to rise its social spending in the areas of education, healthcare and pension, which will boost consumption over time.

vi. There is also need to provide more support to rural areas and less-developed regions of the country.

8.4.5 Recommendations for the Government of South Africa

(A) From the perspective of results derived in this study:

It is to be noted that none of the economic and institutional determinants are found to be significantly affecting the FDI inflows in South Africa. Therefore, following recommendations are suggested to the Government of South Africa:

i. Unemployment rates Granger cause FDI inflows and South Africa is at the top of having maximum average unemployment rates during the three decades among BRICS. Therefore, the Government of South Africa should launch various schemes as suggested in case of India.

ii. Trade openness in South Africa Granger causes FDI inflows and also vice versa. The position of this factor is quite commendable in the country as nearly all business sectors are open to foreign investors. Government approval is not required and there are few restrictions on how or how much the foreign entities can invest. Additionally, the Government has put in place various measures to encourage foreign investments, including simple tax rules, investment incentives, a better

regulatory policy on competition, protection of intellectual rights, etc. Therefore, the Government should keep up this momentum in future too.

iii. South African government should focus on its results on FDI inflows each year, i.e. it should try to keep up the pace of fetching more and more FDI inflows consistently. This is because results of this study show that its own history attracts the foreign investors to invest in this country. Since this country joined the BRICS formally in 2010 only, it might get good impetus in the coming years also by having a global presence via this forum.

(B) From the general perspective based on current scenario:

iv. Government should focus on higher levels of inclusive growth that will raise employment opportunities and also reduce income inequality.

v. There is a need to motivate the population of South Africa to indulge in savings by giving them better interest rates on savings.

vi. Government should frame and restructure its exchange rate policies so as to keep a check on its volatile currency.

vii. It is recommended that more incentives and subsidies should be granted to people investing in productive sectors of the country.

viii. Focus should be laid on education and training and development needs of the workforce.

8.4.6 Recommendations for BRICS as a group

One common challenge that BRICS economies face is the need for institutional development without which sustainable growth cannot be ensured. After the global economic crisis, most economies (including the developed or advanced economies of the world) are adversely affected by financial instability and weak growth. In such a scenario, the BRICS countries have an amazing opportunity to coordinate their economic policies and discreet strategies not only to enhance their position as a group in the international forum but also to bring some stability in the world economy as a whole.

It's a big challenge in front of the BRICS countries not only to sustain their position but also to increasingly harmonize and coordinate their policies to face global turbulence in future too.

Recommendations for the BRICS as a group or commonly to all the five countries are to make friendly policies related to starting a business, dealing with construction permits, getting electricity, registering a property, getting credit, protection of intellectual property rights, paying taxes, trading across borders, enforcing contracts and resolving conflicts (as defined in the ease of doing business index as per World Bank). Also, BRICS group should make proper policies to handle the following issues as suggested by this study:

i. In terms of GDP growth rates, BRICS have not performed well, it has deteriorated from an average of 3.20% to 1.64% over a period of thirty three years. It is majorly because of low or negative growth rates of Brazil and Russia over this time period.
ii. Unemployment rates on an average have risen with a minor increase from year 1983 (8.77%) to 9.81% in year 2015.
iii. BRICS performance in annual percentage growth rates of gross capital formation has deteriorated even further as compared to 1983. On an average BRICS had -0.85% gross capital formation growth rate which has fallen down to -5.23% in 2015.
iv. In terms of bureaucracy quality, corruption, external conflict and internal conflict the performance of BRICS has also diminished.

Thus, it is suggested to the policy makers of the BRICS to take proper corrective measures and improvise their macro- economic situation as well as institutional quality so as to become the supreme powers of the world.

8.5 Limitations of the study

Although the study tries to provide all the possible solutions to the said objectives, but still it is subject to few limitations:

1. There are many other emerging economies for which this study could be conducted but the focus in this study is confined to BRICS nations only.
2. Impact of only few macro- economic and institutional determinants on FDI inflows has been studied. However, more determinants could be added but because of data constraints, it seems to be one of the limitations.
3. The study considers the secondary data on economic determinants which has its own limitations like the issue of completeness.

4. The models proposed by the study has its own limitations of generalization of its results in future context also as with the passage of time, some more economic and institutional determinants may be added to literature and a further analysis can be done with the help of them depending on the availability of their data.
5. Another limitation is with the data which is compiled on the 'Current USD' basis (at the end of year 2015) which keeps on varying with the exchange rate movements. So, the same data can not be used to draw inferences in future scenarios of FDI inflows of BRICS.

8.6 Scope of future research

1. The models developed in the study can be applied to determine the impact of FDI on economic growth of other well known economic blocs of the world (like SAARC, ASEAN, G-20, etc.)
2. The models developed in the study can also be applied to determine the impact of FDI on economic growth of other upcoming groups like MINT, PIN, Next Eleven, etc.
3. The models developed in the study can also be applied to assess the impact of economic and institutional determinants on FDI outflows of BRICS and other economic blocs also.
4. More or different economic and institutional determinants can be added to the models proposed by the study provided the problem of multicollinearity does not arise.

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APPENDIX I: DESCRIPTIVE STATISTICS, SHAPIRO WILK TEST OF NORMALITY AND REMOVAL OF OUTLIERS

Table 5.6: Descriptive Statistics of both dependent and independent economic determinants used in the OLS Robust Model of India

Descriptives				
			Statistic	Std. Error
Y	Mean		.1945	.13492
	95% Confidence Interval for Mean	Lower Bound	-.0803	
		Upper Bound	.4693	
	5% Trimmed Mean		.2410	
	Median		.2663	
	Variance		.601	
	Std. Deviation		.77504	
	Minimum		-2.55	
	Maximum		1.71	
	Range		4.26	
	Interquartile Range		.78	
	Skewness		-1.242	.409
	Kurtosis		4.088	.798
X1	Mean		.0236	.10346
	95% Confidence Interval for Mean	Lower Bound	-.1872	
		Upper Bound	.2343	
	5% Trimmed Mean		.0254	
	Median		.0079	
	Variance		.353	
	Std. Deviation		.59435	
	Minimum		-1.66	
	Maximum		1.65	
	Range		3.30	
	Interquartile Range		.54	

Descriptives				
			Statistic	Std. Error
	Skewness		-.081	.409
	Kurtosis		2.078	.798
X2	Mean		.1501	.74176
	95% Confidence Interval for Mean	Lower Bound	-1.3608	
		Upper Bound	1.6610	
	5% Trimmed Mean		.0867	
	Median		.3266	
	Variance		18.157	
	Std. Deviation		4.26108	
	Minimum		-10.20	
	Maximum		14.09	
	Range		24.30	
	Interquartile Range		2.89	
	Skewness		.306	.409
	Kurtosis		3.521	.798
X3	Mean		-.0089	.07510
	95% Confidence Interval for Mean	Lower Bound	-.1619	
		Upper Bound	.1440	
	5% Trimmed Mean		.0010	
	Median		.0077	
	Variance		.186	
	Std. Deviation		.43140	
	Minimum		-1.06	
	Maximum		1.01	
	Range		2.07	
	Interquartile Range		.46	
	Skewness		-.410	.409
	Kurtosis		1.100	.798

Descriptives				
			Statistic	Std. Error
X4	Mean		.0117	.02460
	95% Confidence Interval for Mean	Lower Bound	-.0385	
		Upper Bound	.0618	
	5% Trimmed Mean		.0105	
	Median		-.0014	
	Variance		.020	
	Std. Deviation		.14133	
	Minimum		-.48	
	Maximum		.44	
	Range		.91	
	Interquartile Range		.01	
	Skewness		.000	.409
	Kurtosis		6.499	.798
X5	Mean		.0352	.01401
	95% Confidence Interval for Mean	Lower Bound	.0067	
		Upper Bound	.0638	
	5% Trimmed Mean		.0357	
	Median		.0361	
	Variance		.006	
	Std. Deviation		.08051	
	Minimum		-.14	
	Maximum		.20	
	Range		.34	
	Interquartile Range		.12	
	Skewness		-.176	.409
	Kurtosis		-.388	.798
X6	Mean		-.0099	.01115
	95% Confidence	Lower Bound	-.0326	

Descriptives				
			Statistic	Std. Error
	Interval for Mean	Upper Bound	.0128	
	5% Trimmed Mean		-.0086	
	Median		-.0125	
	Variance		.004	
	Std. Deviation		.06406	
	Minimum		-.18	
	Maximum		.12	
	Range		.29	
	Interquartile Range		.08	
	Skewness		-.258	.409
	Kurtosis		.472	.798
X7	Mean		.1560	2.63432
	95% Confidence Interval for Mean	Lower Bound	-5.2100	
		Upper Bound	5.5219	
	5% Trimmed Mean		.2760	
	Median		1.2988	
	Variance		229.009	
	Std. Deviation		15.13303	
	Minimum		-28.74	
	Maximum		27.12	
	Range		55.86	
	Interquartile Range		20.53	
	Skewness		-.103	.409
	Kurtosis		-.632	.798
X8	Mean		.0107	.03679
	95% Confidence Interval for Mean	Lower Bound	-.0642	
		Upper Bound	.0857	
	5% Trimmed Mean		.0102	

Descriptives				
			Statistic	Std. Error
	Median		.0388	
	Variance		.045	
	Std. Deviation		.21135	
	Minimum		-.47	
	Maximum		.47	
	Range		.94	
	Interquartile Range		.31	
	Skewness		-.136	.409
	Kurtosis		.257	.798
X9	Mean		1.9268	.53162
	95% Confidence Interval for Mean	Lower Bound	.8439	
		Upper Bound	3.0097	
	5% Trimmed Mean		1.6832	
	Median		.9594	
	Variance		9.327	
	Std. Deviation		3.05395	
	Minimum		-2.64	
	Maximum		11.01	
	Range		13.64	
	Interquartile Range		2.99	
	Skewness		1.485	.409
	Kurtosis		1.891	.798

Table 5.7: Test of Normality for data on economic determinants of India: Shapiro-Wilk

Variables	Shapiro-Wilk		
	Statistic	df	Sig.*
Y	.914	33	.013
X1	.960	33	.260

Variables	Shapiro-Wilk		
	Statistic	df	Sig.*
X2	.894	33	.004
X3	.966	33	.376
X4	.685	33	.000
X5	.987	33	.960
X6	.985	33	.921
X7	.976	33	.657
X8	.963	33	.318
X9	.837	33	.000

*Note: A significance value < 0.05 indicates that the null hypothesis can be rejected.

Null Hypothesis: The data series is normally distributed.

Table 5.8: Removal of Outliers from data on economic determinants not showing normality in India

Variable	Outliers removed
Y	Year 1983
X1	None
X2	Years 2008-2010
X3	None
X4	Years 1983-1994, 2011-2013 and 2015
X5	None
X6	None
X7	None
X8	None
X9	Years 2006- 2008 and 2011- 2012

Table 5.9: Descriptive Statistics of both dependent and independent economic variables used in the OLS Robust Model of China

Descriptives			
		Statistic	Std. Error
Y	Mean	.1929	.04719

Descriptives				
			Statistic	Std. Error
	95% Confidence Interval for Mean	Lower Bound	.0968	
		Upper Bound	.2890	
	5% Trimmed Mean		.1753	
	Median		.1224	
	Variance		.073	
	Std. Deviation		.27108	
	Minimum		-.27	
	Maximum		.94	
	Range		1.21	
	Interquartile Range		.20	
	Skewness		1.264	.409
	Kurtosis		1.870	.798
X1	Mean		-.0081	.05045
	95% Confidence Interval for Mean	Lower Bound	-.1109	
		Upper Bound	.0947	
	5% Trimmed Mean		-.0050	
	Median		-.0304	
	Variance		.084	
	Std. Deviation		.28983	
	Minimum		-.99	
	Maximum		.86	
	Range		1.84	
	Interquartile Range		.22	
	Skewness		-.357	.409
	Kurtosis		5.192	.798
X2	Mean		.0001	.00624
	95% Confidence Interval for Mean	Lower Bound	-.0126	
		Upper Bound	.0129	

Descriptives				
			Statistic	Std. Error
	5% Trimmed Mean		.0003	
	Median		-.0048	
	Variance		.001	
	Std. Deviation		.03585	
	Minimum		-.10	
	Maximum		.10	
	Range		.20	
	Interquartile Range		.03	
	Skewness		-.058	.409
	Kurtosis		2.154	.798
X3	Mean		-.0139	.90460
	95% Confidence Interval for Mean	Lower Bound	-1.8565	
		Upper Bound	1.8287	
	5% Trimmed Mean		.0875	
	Median		.0022	
	Variance		27.004	
	Std. Deviation		5.19652	
	Minimum		-15.27	
	Maximum		11.52	
	Range		26.79	
	Interquartile Range		4.84	
	Skewness		-.398	.409
	Kurtosis		1.814	.798
X4	Mean		.0071	.01698
	95% Confidence Interval for Mean	Lower Bound	-.0274	
		Upper Bound	.0417	
	5% Trimmed Mean		.0111	
	Median		.0000	

Descriptives				
			Statistic	Std. Error
	Variance		.010	
	Std. Deviation		.09754	
	Minimum		-.33	
	Maximum		.26	
	Range		.59	
	Interquartile Range		.07	
	Skewness		-.853	.409
	Kurtosis		4.882	.798
X5	Mean		.0317	.02132
	95% Confidence Interval for Mean	Lower Bound	-.0117	
		Upper Bound	.0751	
	5% Trimmed Mean		.0301	
	Median		.0180	
	Variance		.015	
	Std. Deviation		.12245	
	Minimum		-.26	
	Maximum		.32	
	Range		.58	
	Interquartile Range		.16	
	Skewness		.281	.409
	Kurtosis		.465	.798
X6	Mean		-.0103	.01841
	95% Confidence Interval for Mean	Lower Bound	-.0478	
		Upper Bound	.0272	
	5% Trimmed Mean		-.0034	
	Median		.0202	
	Variance		.011	
	Std. Deviation		.10575	

Descriptives				
			Statistic	Std. Error
	Minimum		-.28	
	Maximum		.12	
	Range		.40	
	Interquartile Range		.14	
	Skewness		-1.062	.409
	Kurtosis		.571	.798
X7	Mean		-.1201	.19732
	95% Confidence Interval for Mean	Lower Bound	-.5221	
		Upper Bound	.2818	
	5% Trimmed Mean		-.0834	
	Median		.0349	
	Variance		1.285	
	Std. Deviation		1.13352	
	Minimum		-3.90	
	Maximum		3.13	
	Range		7.02	
	Interquartile Range		.80	
	Skewness		-.749	.409
	Kurtosis		4.643	.798
X8	Mean		.0085	.04908
	95% Confidence Interval for Mean	Lower Bound	-.0915	
		Upper Bound	.1085	
	5% Trimmed Mean		.0331	
	Median		.0491	
	Variance		.079	
	Std. Deviation		.28192	
	Minimum		-.89	
	Maximum		.50	

Descriptives				
			Statistic	Std. Error
	Range		1.38	
	Interquartile Range		.26	
	Skewness		-1.613	.409
	Kurtosis		4.110	.798
X9	Mean		.1111	.26209
	95% Confidence Interval for Mean	Lower Bound	-.4228	
		Upper Bound	.6450	
	5% Trimmed Mean		.1973	
	Median		.2049	
	Variance		2.267	
	Std. Deviation		1.50561	
	Minimum		-6.69	
	Maximum		4.27	
	Range		10.96	
	Interquartile Range		.62	
	Skewness		-2.349	.409
	Kurtosis		14.663	.798

Table 5.10: Test of Normality for data on economic determinants of China: Shapiro-Wilk

	Shapiro-Wilk		
	Statistic	df	Sig.*
Y	.885	33	.002
X1	.873	33	.001
X2	.947	33	.109
X3	.952	33	.150
X4	.863	33	.001
X5	.974	33	.605
X6	.902	33	.006

X7	.856	33	.000
X8	.859	33	.001
X9	.641	33	.000

*Note: A significance value < 0.05 indicates that the null hypothesis can be rejected.

Null Hypothesis: The data series is normally distributed.

Table 5.11: Removal of Outliers from data on economic determinants not showing normality in China

Variable	Outliers removed
Y	Years 1984, 1992-1993 and 2009-2010
X1	Years 1989 and 1991-1992
X2	Dropped due to multicollinearity
X3	None
X4	Years 1983-1984, 1989 and 2001
X5	None
X6	Year 1990
X7	Years 1986, 1989-1991 and 2015
X8	Years 1985 and 1992
X9	Years 2000-2002 and 2005

APPENDIX II: QUESTIONNAIRE FOR THE INTERVIEW OF GOVERNMENT OFFICIALS

Priya Gupta,

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Title of the Study: Impact of Foreign Direct Investment on Economic Growth: A Study on BRICS Nations

Research Objectives:

The study aims to achieve the following objectives:

1. To analyze the causal relationship between FDI and economic growth in Brazil, Russia, India, China and South Africa individually.
2. To ascertain significant determinants (both economic and institutional) of FDI inflows in Brazil, Russia, India, China and South Africa individually.
3. To estimate the most significant determinants impacting the FDI inflows in BRICS nations as a group.
4. To examine the trends and patterns of macro- economic environment and institutional quality, challenges and prospects of BRICS nations.

Ques.1- Do you think there is an impact of FDI inflows on the economic growth of individual BRICS countries? If yes, what is your opinion on this issue?

Brazil-

Russia-

India-

China-

South Africa-

Ques.2- Do you think is it vice versa, i.e. while these economies are growing, FDI inflow is coming into these countries? If yes, what is your opinion?

Brazil-

Russia-

India-

China-

South Africa-

Ques.3- What is your opinion on determinants impacting their economic growth?

Brazil-

Economic-

Qualitative-

Russia-

Economic-

Qualitative-

India-

Economic-

Qualitative-

China-

Economic-

Qualitative-

South Africa-

Economic-

Qualitative-

Ques.4- What is your opinion on determinants impacting their FDI inflows?

Brazil:

Positive-

Negative-

Russia:

Positive-

Negative-

India:

Positive-

Negative-

China:

Positive-

Negative-

South Africa:

Positive-

Negative-

Ques.5- What is your opinion on the common factors impacting FDI inflows in BRICS as a group?

Positive-

Negative-

Ques.6- Could you please comment on the strengths and weaknesses of these economies to become prospective leaders in attracting FDI inflows?

Brazil

Strengths-

Weaknesses-

Russia

Strengths-

Weaknesses-

India

Strengths-

Weaknesses-

China

Strengths-

Weaknesses-

South Africa

Strengths-

Weaknesses-

Ques.7- Could you please share your opinion on the challenges that these countries are facing in terms of internal and external factors?

Brazil-

Russia-

India-

China-

South Africa-

Ques.8- What are your views on the prospects of these countries in terms of economic growth and FDI inflows?

Brazil

Economic Growth-

FDI inflows-

Russia

Economic Growth-

FDI inflows-

India

Economic Growth-

FDI inflows-

China

Economic Growth-

FDI inflows-

South Africa

Economic Growth-

FDI inflows-

Any other comments/ suggestions:

Disclaimer: *Thank you for sparing your valuable time. Your contribution to the present study will be highly appreciated. The study is done purely for the academic purpose. The results will be exclusively used for fulfilling the requirements of the Ph.D. Degree from Delhi School of Management, Delhi Technological University. The study is purely based on secondary data and statistical/ econometric analysis of that data. Your opinion on the result will enrich the quality of the study and will also add to better understanding of the derived results.*

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1. "Trend Analysis of Quantitative and Qualitative Determinants affecting FDI inflows in BRICS" at *National Conference on Managing Change in Evolving Economic Scenario* held on 5th- 6th December, 2017 organized by Management Development Institute, Gurugram (in collaboration with ASSOCHAM).
2. "Empirical Analysis of Factors Attracting Foreign Direct Investment in India" at 5th *International Conference on Management Practices and Research* (ICMPR-2015) held on 24th July, 2015 organized by Apeejay School of Management, Delhi.
3. "Leveraging Indian Labour for augmenting Foreign Direct Investments" at *Conference* on *Leadership and Organizatonal Effectiveness* held on 23rd May, 2015 organized by Apeejay School of Management, Delhi.
4. "An Empirical Study of Bilateral Relationship between Foreign Direct Investment and Economic Growth" at *International Conference on Emerging Global Economic Perspectives* held on 11th April, 2015 organized by Jaipuria Institute of Management, Ghaziabad.

5. "Impact of FDI on Economic Growth: A Literature Review" at *6th National Conference on Contemporary Management and Research: Advancements in Management Theories and Practices* held on 17th October, 2014 organized by Apeejay School of Management, Delhi.
6. "Impact of Foreign Direct Investment on various sectors of Indian Economy" at *One Day National Conference on Emerging Issues in International Trade and Finance* held on 16th October, 2014 organized by Deen Dayal Upadhyay College, University of Delhi.
7. "Determinants of FDI in BRIC Nations: A Review of Existing Literature" at *Conference on Innovative Financial Practices and Developments: Emerging Financial Paradigms* held on 20th December, 2013 organized by Apeejay School of Management, Delhi.
8. "Determinants of Foreign Direct Investment in BRIC Nations" at *6th International Conference on Contemporary Business- 2012* held on 18th-19th October, 2012 at IIT Delhi jointly organized by IIT Delhi and Curtin University, Australia.